

**THE CONNECTICUT VALLEY ELECTRIC TRANSMISSION
RELIABILITY PROJECTS**

APPLICATION TO THE

CONNECTICUT SITING COUNCIL

**FOR CERTIFICATES OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED
FOR**

THE CONNECTICUT PORTION

OF THE GREATER SPRINGFIELD RELIABILITY PROJECT

AND FOR

**THE MANCHESTER TO MEEKVILLE JUNCTION CIRCUIT
SEPARATION PROJECT**

BY

THE CONNECTICUT LIGHT & POWER COMPANY

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EX. 2: “Inventory of Vernal Pools and Amphibian Breeding Habitats Along the Connecticut Portion of the Greater Springfield Reliability Project” by ENSR

EX. 3: “Environmental Sound Assessment Study – North Bloomfield Substation” by Burns & McDonnell Engineering Company, Inc.

EX. 4: Federal, State, and Municipal Agencies Correspondence

- 1) SHPO Letter to Jeff Borne, NU dated February 8, 2006. Sub: CL&P Greater Springfield Reliability Project Bloomfield, East Granby, Suffield and Enfield, CT.
- 2) US FWS letter to Don Biondi, NU dated May 14, 2008. Re: Transmission line upgrade/expansion in Manchester, CT.
- 3) US FWS letter to Don Biondi, NU dated Nov 8, 2007. Re: Electric transmission facilities expansion 6 sites in CT, 17 sites MA.
- 4) CT DEP Bureau of Natural Resources letter to Don Biondi, NU dated March 17, 2008. Re: The Connecticut Light & Power Company Greater Springfield Reliability Project in Bloomfield, East Granby, Granby, Enfield, Somers and Suffield, Connecticut.
- 5) CT DEP letter to Don Biondi, NU dated March 10, 2008. Re: Greater Springfield Reliability Project.
- 6) CT DEP letter to Don Biondi, NU dated April 24, 2008. Re: Proposed upgrade and expansion of CL&P Manchester Substation to Meekville Junction in Manchester.
- 7) Town of Bloomfield Inland Wetlands and Watercourses Commission, NU dated August 28, 2008. Re: CL&P Location Review North Bloomfield Substation Expansion.
- 8) Town of Bloomfield Plan and Zoning Commission to Jeff Towle, NU dated September 2, 2008.
- 9) CT DEP National Diversity Database, NU dated September 15, 2008. Re: Update on the CL&P Greater Springfield Reliability Project Rare Species Surveys.

EX. 1: “Inventory of Potential Breeding Bird Species and Habitats Along the Connecticut Portions of Greater Springfield Reliability Project” by ENSR

**INVENTORY OF POTENTIAL BREEDING BIRD SPECIES AND HABITATS
ALONG THE CONNECTICUT PORTIONS OF
GREATER SPRINGFIELD RELIABILITY PROJECT**

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1.0 Introduction

The purpose of this report is to describe and summarize the results of breeding bird research and surveys conducted along the proposed and alternative transmission line routes for the Connecticut portions of the Greater Springfield Reliability Project (GSRP or Project). The GSRP is proposed by the Connecticut Light and Power Company (CL&P) and the Western Massachusetts Electric Company (WMECO) and involves the development or reconstruction of transmission facilities, principally within existing transmission line rights-of-way (ROWs) in both Connecticut and Massachusetts.

In accordance with the requirements of the Connecticut Siting Council (*Application Guides for Terrestrial Electric Transmission Line Facilities*; August 2007; Section IX.H.1, which calls for an inventory of breeding birds and their habitats), CL&P retained ENSR Corporation (ENSR) to:

- Provide an inventory of the bird species which are likely to breed on or in close proximity to the GSRP ROWs in Connecticut;
- Identify and describe the habitat cover types that are prevalent in the GSRP areas; and
- Describe in general terms the potential effects of construction and operation of the Project on the bird species present in the Project area.

The Connecticut portions of the GSRP facilities would consist primarily of an approximately 12-mile long segment of new 345-kilovolt (kV) transmission line to be constructed in the north-central portion of the state. The transmission line would begin at CL&P's North Bloomfield Substation and continue north, traversing the municipalities of Bloomfield, East Granby, and Suffield (Hartford County) to the Connecticut/Massachusetts state border. In addition to the proposed 345-kV transmission line, CL&P's existing North Bloomfield Substation would have to be expanded to accommodate the new 345-kV interconnections; this expansion would involve the use of an additional 3 acres of presently undeveloped woodland and shrubland habitat. In Massachusetts, this transmission line would extend north along existing transmission line corridors to WMECO's Agawam Substation. This route is known as the Connecticut Portion of the North Bloomfield to Agawam Line Route.

An additional project component would involve the separation of existing transmission line circuits along the 2.2-mile segment of CL&P's existing transmission line right-of-way

between Manchester Junction and CL&P's Manchester Substation in Manchester, Connecticut. This component of the GSRP is referred to as the Manchester to Meekville Junction Circuit Separation Project (Manchester to Meekville Project).

As currently proposed, the lines for both these routes would be built overhead, predominantly within the boundaries of existing CL&P overhead transmission line ROWs, next to existing, operational transmission lines.

As part of the GSRP, WMECO also proposes a new 345-kV transmission line between its Agawam and Ludlow substations. The route for this 345-kV line would be located entirely in Massachusetts along existing transmission line ROWs.

However, as required by Massachusetts siting requirements, WMECO will present to the Massachusetts Energy Facilities Siting Board (EFSB) a "geographically distinct designated alternative", referred to as a "noticed alternative", to the route between the Agawam and Ludlow substations. Although the majority of this designated alternative route would be located in Massachusetts, its southern portion generally would parallel the Massachusetts/Connecticut state border, and would cross into Connecticut for a short distance (approximately 5.5 miles), traversing the northern portions of the towns of Suffield and Enfield. In Connecticut, this route is known as the Connecticut Portion of the Massachusetts Southern Route Alternative, and it also would be located along existing ROWs, including the existing ROW between Hampden Junction and Ludlow Substation on which the existing 345-kV tie line between Massachusetts and Connecticut is located.

In addition, four potential underground transmission line variations have been identified for certain segments of the 12-mile Connecticut Portion of the North Bloomfield to Agawam Line Route. Two of these underground variations would be located principally within or adjacent to public road ROWs; these route options are designated as the Newgate Road Underground Line Variation, and the State Route 168/187 Underground Line Variation, both of which are located in East Granby and Suffield. The two other underground variations, which would be aligned within CL&P's existing transmission line ROW and also would traverse portions of East Granby and Suffield, are referred to as the 3.6-Mile in ROW Underground Line Variation and the 4.6-Mile in ROW Underground

Line Variation. A fifth underground variation provides an option to a portion of the Connecticut Portion of the Massachusetts Southern Route Alternative, and is referred to as the Connecticut Portion of the Massachusetts Southern Route Alternative Underground Line Variation. This option is located in entirely within Enfield.

2.0 Methods

The inventory of potential breeding birds in the GSRP area was compiled based on a review of published data concerning breeding birds in north central Connecticut, as well as field reconnaissance of the subject ROWs. Research concerning avian utilization of habitats on ROWs and agency consultations has also been incorporated into this document.

In addition, CL&P and its environmental consultants have consulted with staff at the Connecticut Department of Environmental Protection (CTDEP) Natural Diversity Database (CT NDDDB) and the United States Fish and Wildlife Service (USFWS) to determine if any rare bird species could be expected to occur in or in close proximity to the Project area. Copies of correspondence with these agencies are attached to this report. The USFWS indicated that there are no federally listed rare, threatened, or endangered bird species within the Project area.

CL&P received correspondence from the Connecticut Natural Diversity Data Base, Wildlife Division (CT NDDDB), dated April 24, 2008, indicating that their records show that there are historic records of a state endangered species, the barn owl (*Tyto alba*) in the vicinity of the Manchester to Meekville Project. In response to the CT NDDDB's request for a breeding season survey, ENSR wildlife biologists conducted three field surveys for potential barn owl nesting habitat along the Manchester to Meekville Junction Circuit Separation Project. The results of these surveys are detailed in the Inventory of Potential Breeding Birds Species and Habitats Addendum, attached to this report.

The following sections describe the methods employed to identify breeding bird species, which may potentially occur on the subject ROWs.

Review of Breeding Bird Atlas Data

The Atlas of Breeding Birds of Connecticut (Atlas; Bevier [ed] 1994) was the primary source consulted to determine which bird species are likely to breed in the Project area.

The *Atlas* compiles the results of a comprehensive and systematic survey of Connecticut's breeding birds and their habitats. The *Atlas* was initiated to determine what species of birds nest in Connecticut and what parts of the state are utilized by each species. The *Atlas* is based on field surveys conducted over a five-year period from 1982 to 1986 and incorporates the collective effort of more than 500 volunteers.

The *Atlas* utilizes a grid system based on the United States Geological Survey (USGS) topographic quadrangle mapping system. The system divides Connecticut into 596 "blocks", with each "block" consisting of one-sixth of a USGS topographic quadrangle, representing approximately 10 square miles of geographic coverage. For each block, volunteers recorded observations of bird species and their behavior, identifying which species were observed and whether breeding in that block was considered possible, probable, or confirmed. For each bird species recorded in Connecticut, the *Atlas* includes a discussion of the species' habitat preferences, and provides a distribution map that indicates in which blocks the species was observed and whether breeding was confirmed, probable, or possible.

The Connecticut portion of the GSRP is depicted on the Tariffville, Windsor Locks, Broad Brook and Manchester USGS topographic quadrangle maps. Parts of the Project also occur on three additional topographic quadrangles which straddle the Connecticut/Massachusetts State Line. These are Southwick, West Springfield and Springfield South. Given the geographic distribution of the Project, and in an effort to be as thorough as possible, a bird species was considered as potentially occurring in the Project area if:

- 1) It was listed as a confirmed breeder in Hartford County, Connecticut in the *Atlas*; or
- 2) It is listed as Special Concern, Threatened or Endangered by the CTNDDB or USFWS; and
- 3) The bird species utilizes habitats that occur on the Project ROWs.

Field Reconnaissance of the Project ROWs

For this breeding bird inventory, in addition to conducting a literature review of all bird species known to breed in north central Connecticut, ENSR biologists performed field reconnaissance of the Project ROWs. Assessments of general habitat cover types, as well as notations of dominant plant species assemblages within cover types were documented. To facilitate the field portion of this inventory, aerial photographs with ROW limits overlain on them were used as mapping during the field investigations.

3.0 Results

As a result of the field investigations on the ROWs, eight habitat cover types were identified as occurring within or near the Project area. These are described below.

Old Field/Shrub and Sapling Thickets

This upland habitat is the dominant cover type in the maintained portions of the ROWs and is composed of areas dominated by grasses, forbs, shrubs and saplings. Plant species commonly observed in these habitats include deer tongue (*Panicum clandestinum*), big bluestem (*Andropogon gerardi*), timothy (*Phleum pratense*), orchard grass (*Dactylis glomerata*), goldenrod (*Solidago* spp.), aster (*Aster* spp.), common mullein (*Verbascum thapsus*), whorled loosestrife (*Lysimachia quadrifolia*), brambles (*Rubus* spp.), multiflora rose (*Rosa multiflora*), Japanese barberry (*Berberis thunbergii*), eastern red cedar (*Juniperus virginiana*), witch hazel (*Hamamelis virginiana*), grape (*Vitis* spp.), bittersweet (*Celastrus* spp.) and poison ivy (*Toxicodendron radicans*).

Mixed Deciduous Forest/Conifers

This upland habitat is the dominant cover type in the portion of the ROWs which are not maintained. Included in this category are deciduous hardwood trees such as oak (*Quercus* spp.), maple (*Acer* spp.), hickory (*Carya* spp.), birch (*Betula* spp.) and cherry (*Prunus* spp.). Interspersed with these hardwoods, at varying proportions, are coniferous trees such as eastern hemlock (*Tsuga canadensis*), white pine (*Pinus strobus*) and spruce (*Picea* spp.). Canopies in these habitats are typically subtended by shrub and sapling stratum composed of the overstory species mentioned above, as well as witch hazel (*Hamamelis virginiana*), Japanese barberry (*Berberis thunbergii*), hazelnut (*Corylus* spp.), lowbush blueberry (*Vaccinium angustifolium*) and buckthorn (*Rhamnus* spp.).

Forested Wetland

Forested wetlands are found on certain unmaintained portions of the ROWs. Typically, these areas have canopies that are dominated by some combination of red maple (*Acer rubrum*), yellow birch (*Betula allegheniensis*), pin oak (*Quercus palustris*), swamp white oak (*Quercus bicolor*), Elm (*Ulmus spp.*) and tupelo (*Nyssa sylvatica*). The canopies of the forested wetlands are frequently subtended by a shrub layer composed of species such as northern arrowwood (*Viburnum recognitum*), winterberry (*Ilex verticillata*), wild raisin (*Viburnum cassinoides*), spicebush (*Lindera benzoin*) and swamp azalea (*Rhododendron viscosum*), among others. The herbaceous plant strata can be diverse in many of these wetlands. However, skunk cabbage (*Symplocarpus foetidus*), jewelweed (*Impatiens capensis*), cinnamon fern (*Osmunda cinnamomea*), sensitive fern (*Onoclea sensibilis*), sphagnum moss (*Sphagnum spp.*) and royal fern (*Osmunda regalis*) are frequently dominant.

Shrub Swamp

Outside of maintained ROW areas, habitats identified as shrub swamps frequently occur in areas exhibiting substantial accumulations of organic materials and are commonly associated with organic soils (Histosols). In areas that are part of vegetative management plans, shrub swamps may be the result of periodically removing trees. These types of habitats are frequently inundated and many remain saturated throughout the entire year. Woody plant species prevalent in these areas include buttonbush (*Cephalanthus occidentalis*), swamp rose (*Rosa palustris*), willow (*Salix spp.*), speckled alder (*Alnus rugosa*), highbush blueberry (*Vaccinium corymbosum*), steeplebush (*Spiraea tomentosa*), and meadowsweet (*Spiraea latifolia*). Common herbaceous plants interspersed with these woody species include emergent herbaceous species such as common cattail (*Typha latifolia*), narrow-leaved cattail (*Typha angustifolia*), purple loosestrife (*Lythrum salicaria*), common reed (*Phragmites australis*), soft-stem bulrush (*Scirpus validus*), tussock sedge (*Carex stricta*), wool grass (*Scirpus cyperinus*), as well as other sedges (*Carex spp.*) and rushes (*Juncus spp.*). While these areas do exhibit some degree of interspersion among herbaceous and woody vegetation, shrub swamp habitats are dominated by the latter.

Emergent Marsh

Like the shrub swamp habitats described above, emergent marsh habitats frequently occur in areas exhibiting substantial accumulations of organic materials and are commonly associated with organic soils (Histosols). These types of habitats are frequently inundated and many remain saturated throughout the entire year. This habitat type is typically dominated by emergent herbaceous species such as common cattail (*Typha latifolia*), narrow-leaved cattail (*Typha angustifolia*), purple loosestrife (*Lythrum salicaria*), common reed (*Phragmites australis*), soft-stem bulrush (*Scirpus validus*), tussock sedge (*Carex stricta*), wool grass (*Scirpus cyperinus*), soft rush (*Juncus effusus*), as well as other sedges (*Carex* spp.) and rushes (*Juncus* spp.).

Open Water

This habitat type is characterized by significant areas of open water associated with both lentic and lotic waterbodies. Examples of this type of habitat include lakes, ponds, large streams and rivers.

Agricultural Land

Agricultural land includes all lands currently in active agriculture and includes areas such as hay fields, pastures, orchards and cultivated fields.

Urban Areas

This cover type includes areas where human activities have dominated the landscape. Examples of land uses in urban areas include commercial and industrial, as well as areas dominated by residential development. For all these areas the supporting infrastructure, such as roads, ball fields, playgrounds and adjacent areas, are included as well.

The results of the preliminary inventory of bird species and habitat assessments in the Project vicinity, as well as the identification of the bird species which could be reasonably expected to occur along the ROW are summarized in Table 1.

Based upon the review of the available literature and the results of the field surveys, of the 173 bird species identified in the Atlas as breeding in Connecticut (Bevier 1994), a total of 140 were identified as potentially occurring in the Project area.

Table 1. Breeding Birds Potentially Occurring in the GSRP Area, by Habitat Type

COMMON NAME (1,3)	SCIENTIFIC NAME	HABITAT TYPE (2)							
		OF	MF	FW	SS	EM	OW	AG	UR
Double Crested Cormorant	<i>Phalacrocorax auritus</i>						N, F, C		
Great Blue Heron	<i>Ardea herodias</i>			N, C	F, C	F, C	F	F	
Green Heron	<i>Butorides virescens</i>			N, C	N, C	C, F	F		
Least Bittern (T)	<i>Ixobrychus exilis</i>					N, C, F	F		
Mute Swan	<i>Cygnus Olor</i>					F, C	N, F, C		
Canada Goose	<i>Branta canadensis</i>					N, F, C	N, F, C	N, F, C	
Wood Duck	<i>Aix sponsa</i>		N, F	N, F, C	F, C	F, C	F		
American Black Duck	<i>Anas rubripes</i>	N	N	N, C	N, F, C	N, F, C	F	N, F	
Mallard	<i>Anas platyrhynchos</i>	N	N	N, C	N, F, C	N, F, C	F	N, F	
Blue-winged Teal (T)	<i>Anas discors</i>					N, F, C	F	N, F	
Hooded Merganser	<i>Lophodytes cucullatus</i>			N	F, C	F, C	F		
Common Merganser	<i>Mergus merganser</i>		N	N			F, C		
Turkey Vulture	<i>Cathartes aura</i>		N, F, C					F	F
Bald Eagle (E)	<i>Haliaeetus leucocephalus</i>						N, F, C	N, F, C	
Sharp-shinned Hawk (E)	<i>Accipiter striatus</i>	F	N, F, C	F, C				F, C	F
Cooper's Hawk	<i>Accipiter cooperi</i>	F	N, F, C	F, C				F, C	F
Northern Goshawk	<i>Accipiter gentilis</i>		N, F, C	F, C					
Red-shouldered Hawk	<i>Buteo lineatus</i>		N	N, F, C			F		F
Broad-winged Hawk	<i>Buteo platypterus</i>	F	N, F, C					F, C	
Red-tailed Hawk	<i>Buteo jamaicensis</i>	F	N, F, C					F	F
Peregrine Falcon (E)	<i>Falco peregrinus</i>	F					F	F, C	N, F, C
American Kestrel (T)	<i>Falco sparverius</i>	N, F, C						N, F, C	

Breeding Bird Report
Greater Springfield Reliability Project – Connecticut Portion

COMMON NAME (1,3)	SCIENTIFIC NAME	HABITAT TYPE (2)							
		OF	MF	FW	SS	EM	OW	AG	UR
Ring-necked Pheasant	<i>Phasianus colchicus</i>	N,F,C						N,F,C	
Ruffed Grouse	<i>Bonasa umbellus</i>	F	N,F,C					F,C	
Wild Turkey	<i>Meleagris gallopavo</i>	F,C	N,F,C					F,C	
Northern Bobwhite	<i>Colinus virginianus</i>	N,F,C						N,F,C	
Virginia Rail	<i>Rallus Limicola</i>				F,C	N,F,C	F		
Common Moorhen (E)	<i>Gallinula chloropus</i>				N,C	N,F,C	F		
Kildeer	<i>Charadrius vociferous</i>	F						N,F,C	N,F,C
Spotted Sandpiper	<i>Actitis macularia</i>	N					F	N,C	
Upland Sandpiper (E)	<i>Bartramia longicauda</i>							N,F,C	
American Woodcock	<i>Scolopax minor</i>	N,F,C	N,C	N,C	F,C			F,C	
Rock Dove (Pigeon)	<i>Columba livia</i>							N,F,C	N,F,C
Mourning Dove	<i>Zenaida macroura</i>	F,C	N,F,C					N,F,C	F,C
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	F,C	N,F,C						
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	N,F,C	F						
Eastern Screech-Owl	<i>Otus asio</i>	F	N,F,C	F,C				F,C	N,F,C
Great Horned Owl	<i>Bubo virginianus</i>	F	N,F,C	F,C		F		F,C	F,C
Barred Owl	<i>Strix varia</i>	F	N,F,C	N,F,C		F		F	
Long-eared Owl (E)	<i>Asio otus</i>	F	N,F,C			F		F	
Barn Owl (T)	<i>Tyto alba</i>	F	N	N				N,F	N,F
Common Nighthawk	<i>Chordeiles minor</i>							F	N,F,C
Whip-poor-will (SC)	<i>Caprimulgus vociferous</i>	N,F,C	N,F,C						
Chimney Swift	<i>Chaetura pelagica</i>	F				F	F	F	N,F,C
Ruby-throated Hummingbird	<i>Archilochus-colubris</i>	N,F,C	N,F,C	F,C	F,C	F,C			F,C
Belted Kingfisher	<i>Ceryle alcyon</i>					C	N,F,C		
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>		N,F,C						

Breeding Bird Report
Greater Springfield Reliability Project – Connecticut Portion

COMMON NAME (1,3)	SCIENTIFIC NAME	HABITAT TYPE (2)							
		OF	MF	FW	SS	EM	OW	AG	UR
Red-headed Woodpecker (E)	<i>Melanerpes erythrocephalus</i>	F,C	N,F,C	N,F,C				F,C	
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>		N,F,C	F,C				F,C	
Downy Woodpecker	<i>Picoides pubescens</i>	F,C	N,F,C	N,F,C				F,C	F
Hairy Woodpecker	<i>Picoides villosus</i>	F,C	N,F,C	N,F,C					
Northern Flicker	<i>Colaptes auratus</i>	F,C	N,F,C	F,C				F,C	F
Pleated Woodpecker	<i>Dryocopus pileatus</i>		N,F,C	N,F,C					
Eastern Wood-Pewee	<i>Contopus virens</i>	F,C	N,F,C	F,C					
Willow Flycatcher	<i>Empidonax trailli</i>				N,F,C	F,C	F	F	
Least Flycatcher	<i>Empidonax minimus</i>	F,C	N,F,C	N,F,C					
Eastern Phoebe	<i>Sayornis phoebe</i>	N,F,C	N,F,C	N,F,C	F,C	F,C	F	F	N,F,C
Eastern Kingbird	<i>Tyrannus tyrannus</i>	F,C	N,F,C	N,F,C	F,C	F,C	F	F	F
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	F,C	N,F,C	N,F,C	F,C	F,C	F	F	N,F,C
Horned Lark (E)	<i>Eremophila alpestris</i>							N,F,C	
Purple Martin	<i>Progne subis</i>						F	N,F,C	
Tree Swallow	<i>Tachycineta bicolor</i>	F,C	N,F,C	N,F,C	F,C	F,C	F	F,C	N,F,C
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>					F,C	N,F,C	F,C	
Bank Swallow	<i>Riparia riparia</i>				F,C	F,C	N,F,C	F,C	
Cliff Swallow	<i>Hirundo pyrrhonota</i>				F,C	F,C	N,F,C	F,C	
Barn Swallow	<i>Hirundo rustica</i>	F,C			F,C	F,C	F,C	F,C	N,F,C
Blue Jay	<i>Cyanocitta cristata</i>	F,C	N,F,C	N,F,C				F,C	N,F,C
American Crow	<i>Corvus brachyrhynchos</i>	F,C	N,F,C	F,C	F,C	F,C	F,C	F,C	N,F,C
Fish Crow	<i>Corvus ossifragus</i>	F,C	N,F,C	N,F,C	F,C	F,C	F	F,C	N,F,C
Black-capped Chickadee	<i>Parus atricapillus</i>	F,C	N,F,C	N,F,C				F,C	N,F,C
Tufted Titmouse	<i>Parus bicolor</i>	F,C	N,F,C	N,F,C				F,C	F,C

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Greater Springfield Reliability Project – Connecticut Portion

COMMON NAME (1,3)	SCIENTIFIC NAME	HABITAT TYPE (2)							
		OF	MF	FW	SS	EM	OW	AG	UR
Red-breasted Nuthatch	<i>Sitta canadensis</i>		N,F,C	N,F,C					N,F,C
White-breasted Nuthatch	<i>Sitta carolinensis</i>		N,F,C	N,F,C				F,C	F,C
Brown Creeper	<i>Certhia americana</i>		N,F,C	N,F,C					
Carolina Wren	<i>Thryothorus ludovicianus</i>	N,F,C	N,F,C	N,F,C				F,C	N,F,C
House Wren	<i>Troglodytes aedon</i>	N,F,C	N,F,C					N,F,C	N,F,C
Winter Wren	<i>Troglodytes troglodytes</i>		N,F,C	N,F,C					
Sedge Wren (E)	<i>Cistothorus platensis</i>					N,F,C		N,F,C	
Golden-crowned Kinglet	<i>Regulus satrapa</i>		N,F,C						
Blue-gray Gnatcatcher	<i>Poliophtila caerulea</i>	F,C	N,F,C	N,F,C				F,C	F,C
Eastern Bluebird	<i>Sialia sialis</i>	N,F,C	N,C	C				N,F,C	N,F,C
Veery	<i>Catharus fuscescens</i>		N,F,C	N,F,C	N,F,C				
Hermit Thrush	<i>Catharus guttatus</i>		N,F,C	F,C					
Wood Thrush	<i>Hylocichla mustelina</i>		N,F,C	N,F,C	F,C				
American Robin	<i>Turdus migratorius</i>	N,F,C	N,F,C	F,C	F,C			N,F,C	N,F,C
Gray Catbird	<i>Dumetella carolinensis</i>	N,F,C	N,F,C	N,F,C	N,F,C	F,C		N,F,C	N,F,C
Northern Mockingbird	<i>Mimus polyglottos</i>	N,F,C	F,C	F,C				N,F,C	N,F,C
Brown Thrasher (SC)	<i>Toxostoma rufum</i>	N,F,C	F,C	F,C				N,F,C	N,F,C
Cedar Waxwing	<i>Bombycilla cedrorum</i>	N,F,C	F,C					N,F,C	F,C
European Starling	<i>Sturnus vulgaris</i>	N,F,C				F,C		N,F,C	N,F,C
White-eyed Vireo	<i>Vireo griseus</i>	N,F,C	F,C	F,C				N,F,C	
Blue-headed Vireo	<i>Vireo solitarius</i>	F,C	N,F,C	F,C					

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COMMON NAME (1,3)	SCIENTIFIC NAME	HABITAT TYPE (2)							
		OF	MF	FW	SS	EM	OW	AG	UR
Yellow-throated Vireo	<i>Vireo flavifrons</i>	F,C	N,F,C	F,C					
Warbling Vireo	<i>Vireo gilvus</i>	F,C	N,F,C	N,F,C	F,C				
Red-eyed Vireo	<i>Vireo olivaceus</i>	F,C	N,F,C	N,F,C					N,F,C
Blue-winged Warbler	<i>Vermivora pinus</i>	N,F,C	N,F,C	N,F,C	N,F,C	N,F,C		N,F,C	
Golden-winged Warbler	<i>Vermivora chrysoptera</i>	N,F,C	N,F,C	F,C	F,C			N,F,C	
Nashville Warbler	<i>Vermivora ruficapilla</i>	N,F,C	N,F,C	F,C	F,C			F,C	
Yellow Warbler	<i>Dendroica petechia</i>	N,F,C	N,F,C	N,F,C	N,F,C	F,C		N,F,C	N,F,C
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>	N,F,C	N,F,C	F,C	F,C			N,F,C	
Magnolia Warbler	<i>Dendroica magna</i>	F,C	N,F,C	F,C	F,C				
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>	F,C	N,F,C	F,C	F,C				F,C
Yellow-rumped Warbler	<i>Dendroica coronata</i>	F,C	N,F,C	F,C	F,C				
Black-throated Green Warbler	<i>Dendroica virens</i>		N,F,C	F,C					
Blackburnian Warbler	<i>Dendroica fusca</i>		N,F,C	F,C					
Pine Warbler	<i>Dendroica pinus</i>	F,C	N,F,C	F,C					
Prairie Warbler	<i>Dendroica discolor</i>	N,F,C	F,C	F,C				N,F,C	
Black-and-white warbler	<i>Mniotilta varia</i>		N,F,C	F,C				F,C	
American Redstart	<i>Setophaga ruticilla</i>	N,F,C	N,F,C	N,F,C				N,F,C	F,C
Worm-eating Warbler	<i>Helminthos vermivorus</i>		N,F,C	F,C					
Ovenbird	<i>Seiurus aurocapillus</i>		N,F,C	F,C					
Northern Waterthrush	<i>Seiurus noveboracensis</i>			N,F,C	F,C		F		
Louisiana Waterthrush	<i>Seiurus motacilla</i>			N,F,C	F,C		F		
Common Yellowthroat	<i>Geothlypis trichas</i>	N,F,C	N,F,C	N,F,C	N,F,C			N,F,C	

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COMMON NAME (1,3)	SCIENTIFIC NAME	HABITAT TYPE (2)							
		OF	MF	FW	SS	EM	OW	AG	UR
Hooded Warbler	<i>Wilsonia citrina</i>		N,F,C	N,F,C	F,C				
Canada Warbler	<i>Wilsonia canadensis</i>		F,C	N,F,C	F,C				
Scarlet Tanager	<i>Piranga olivacea</i>	F	N,F,C	F,C					
Northern Cardinal	<i>Cardinalis cardinalis</i>	N,F,C	N,F,C	F,C				N,F,C	N,F,C
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	F	N,F,C	F,C					
Indigo Bunting	<i>Passerina cyanea</i>	N,F,C	F,C					N,F,C	
Eastern Towhee	<i>Pipilo erythroph-thalmus</i>	F,C	N,F,C	F,C					
Chipping Sparrow	<i>Spizella passerina</i>	N,F,C	F,C					F,C	N,F,C
Field Sparrow	<i>Spizella pusilla</i>	N,F,C						F,C	
Savannah Sparrow (SC)	<i>Passerculus sandwichensis</i>	N,F,C						N,F,C	
Grasshopper Sparrow (E)	<i>Ammodramus savannarum</i>	N,F,C						N,F,C	
Song Sparrow	<i>Melospiza melodia</i>	N,F,C	N,F,C	N,F,C				N,F,C	N,F,C
Swamp Sparrow	<i>Melospiza Georgiana</i>	F		N,F,C	N,F,C	N,F,C		F	
White-throated Sparrow	<i>Zonotrichia albicollis</i>	F,C	F,C	N,F,C	F,C			F,C	F,C
Dark-eyed Junco	<i>Junco hyemalis</i>	F,C	N,F,C					F,C	F,C
Bobolink (SC)	<i>Dolichonyx oryzivorus</i>							N,F,C	
Red-winged Blackbird	<i>Agelaius phoniceus</i>			F,C	F,C	N,F,C		N,F,C	N,F,C
Eastern Meadowlark (SC)	<i>Sturnella magna</i>							N,F,C	
Common Grackle	<i>Quiscalus quiscula</i>	F		N,F,C	F,C	F,C	F	F,C	N,F,C
Brown-headed Cowbird	<i>Molothrus ater</i>	F,C	N,F,C	N,F,C				F,C	N,F,C
Orchard Oriole	<i>Icterus spurius</i>	F	N,F,C					N,F,C	N,F,C
Baltimore Oriole	<i>Icterus galbula</i>	F	N,F,C					N,F,C	N,F,C

COMMON NAME (1,3)	SCIENTIFIC NAME	HABITAT TYPE (2)							
		OF	MF	FW	SS	EM	OW	AG	UR
Purple Finch	<i>Carpodacus purpureus</i>	F,C	N,F,C	F,C				F,C	F
House Finch	<i>Carpodacus mexicanus</i>	F,C	F,C					F,C	N,F,C
Pine Siskin	<i>Carduelis pinus</i>		N,F,C						N,F,C
American Goldfinch	<i>Carduelis tristis</i>	N,F,C						F,C	N,F,C
House Sparrow	<i>Passer domesticus</i>	F,C						F,C	N,F,C

Table 1 Legend

1. State of Connecticut listings: E = Endangered; T = Threatened; SC = Special Concern
2. OF = Old Field/Shrub and Sapling Thickets
MF = Mixed Deciduous Forest/Conifers
FW = Forested Wetland
SS = Shrub Swamp
EM = Emergent Marsh
OW = Open Water
AG = Agricultural Lands
UR = Urban Area
3. For each species listed, habitat types marked with an “N” indicate that the species may utilize that habitat type for nesting, an “F” indicates the species may forage in that habitat, and a “C” indicates the species may utilize that habitat for cover, resting, or roosting. Blank boxes indicate the species is not typically found in that habitat type, except as occasional transients.

4.0 Discussion

Avian Utilization of Right-of-Way Habitats

The “edge effect” is a classic ecological principal that states that the edge between differing habitat types, such as between a utility corridor maintained in shrub-scrub vegetation and adjacent forested areas, typically produces larger numbers and a greater diversity of wildlife than the adjacent habitats considered alone. This is because the border between habitats is inhabited by species that specialize in utilizing edge habitats, as well as by species that primarily use either of the adjacent habitat types. This situation is the norm for ROWs in New England, where the dominant old field/shrubland habitat of a typical ROW often borders different habitat cover types. As a result, ROWs can support a large and diverse population of bird species (Confer and Pascoe 2003; King and Byers 2002; Yahner et. al. 2002; Yahner et. al. 2003).

Long-term studies of bird populations on ROWs have confirmed that they typically support a greater number and diversity of birds than adjacent forested habitats, as they not only provide food and nesting opportunities for early successional species, but also are important sources of food and cover for woodland species (Confer and Pascoe 2003; Pagen et. al. 2000; Yahner et. al. 2002; Yahner et. al. 2003). Studies have also shown that vegetation management on ROWs does not have a significant detrimental effect on bird populations that utilize the habitat either for nesting or simply for food and cover (King and Byers 2002; Yahner et. al. 2003), and that the presence of a ROW does not significantly affect either nesting success of woodland species in the adjacent forested habitat, or brood parasitism by brown-headed cowbirds (Confer and Pascoe 2003; King and Byers 2002; Yahner et. al. 2003).

In addition, the old field/shrubland habitat typically maintained on ROWs is becoming scarce in Connecticut and in the Northeast in general, as farmlands have been abandoned and have reverted back to forest and as existing woodlands mature (Saucier 2003). At its peak around the middle of the 19th century, agricultural practices resulted in the clearing of nearly three-fourths of the forestland in Connecticut, while at present approximately 60% of the state is forested (USDA 2001). The amount of forestland in Connecticut has remained relatively stable since 1972, with losses due to development being approximately offset by new forestland overgrowing abandoned farms; this trend is expected to continue for the foreseeable future (USDA 2001). ROWs therefore represent an important component of regional habitat diversity, providing a stable, long-term source of shrubland habitat in a region where it is becoming scarce. Of the Neotropical migrant bird species from all habitats that show a decline in abundance from 1980-2000 in the Northeast, 90% use disturbance-generated habitats such as open fields, shrublands, mid-successional forests, open parkland, and forest edge, and 72% prefer disturbance and non-climax habitats (Confer and Pascoe 2003).

Consequently, perpetuating disturbance-generated habitats such as those typical of maintained ROWs is becoming an increasing concern for avian conservation. The exchange of forested habitats for shrublands is often interpreted as a net gain for regional biodiversity (Confer and Pascoe 2003).

5.0 Conclusion

The primary effects on birds from the proposed Project will result from vegetation clearing during construction, and ROW vegetation management activities during operation. During construction, existing mature woody vegetation along the ROW will be removed. After the completion of construction, the ROW will be maintained in low-growing shrubby habitat typical of CL&P's existing maintained ROWs and consistent with federal and regional safety standards for overhead transmission lines.

Therefore, a net long term loss of woodland habitat is to be expected. However, this effect will be mitigated by aligning the proposed transmission lines along existing ROWs, and limiting vegetation clearing to areas required for the construction and safe operation of Project facilities. Also as previously stated, the loss of woodland habitat will be offset by a corresponding increase in early successional habitats, which are in decline in Connecticut, as agricultural lands are abandoned and revert to their previously forested state and/or are developed.

In general, the types of habitats found along the GSRP ROWs are common to the region. In addition, the proposed GSRP in Connecticut will result in limited overall effects, because the proposed transmission line routes will extend for less than 15 miles in total (i.e., approximately 12 miles from the North Bloomfield Substation to the Massachusetts border and approximately 2.2 miles along the Manchester to Meekville Junction route), all along existing, already maintained ROWs. Therefore, the principal effect of the Project will be to expand the amount of acreage maintained along the ROWs in scrub-shrub habitat type. These effects also would be similar if the 3.6-Mile or 4.6-Mile In ROW Underground Line Variations are selected, or if – in addition to the proposed 12 miles of the Connecticut GSRP line route, the 5.5-mile Southern Alternative Route had to be constructed and operated in Enfield and Suffield.

The type of habitat preferred by each bird species will not only affect the likelihood of its being negatively impacted, but also the type and severity of any impacts. Species typically found in one of the more open habitat types (old field/shrub and sapling thicket, shrub swamp, emergent marsh, open water, agricultural lands) would not be significantly affected regardless of their abundance as little or no vegetation clearing or management would be required in most of these open habitats.

Species that utilize forested habitats (mixed deciduous forest/conifers and forested wetlands) could be affected to a greater extent, as mature woody vegetation will be cleared where necessary and replaced permanently with early successional and more open habitats. These impacts would be minor, however, as the overall amount of forest cleared would be small, compared to the amount of forest land in the Project vicinity. Following vegetation clearing, birds utilizing the existing ROW edge can be expected to utilize that resource again. Minor direct impacts would be expected for those few individuals that actually nest in the trees that have been removed. However, due to the presence of additional nesting sites in adjacent areas, these effects are expected to be minor.

Overall, the proposed Project is expected to have minor and highly localized, but long-term effects on bird species that utilize forested areas to provide resources for part of their biological and ecological requirements. The Project is also expected to result in minor, temporary adverse impacts to bird species utilizing old field/shrub and sapling thicket habitats resulting from construction of the transmission structures and other aboveground facilities that are associated with the Project (e.g. primarily access roads). These would result from human disturbance during construction activities and temporary loss of habitat in areas cleared for construction. However, construction in any one area would be of short duration and most areas disturbed during construction would be allowed to revert back to old field/shrub and sapling thickets following completion of construction activities. A permanent, but minor adverse effect to birds would result from the loss of habitat associated the additional vegetation removal associated with the expansion of the North Bloomfield Substation.

Overall, the Project would have a long-term beneficial impact to bird species that utilize habitats such as old field/shrub and sapling thickets, shrub swamps, emergent marsh and to a lesser degree open water, as the amount of this habitat type would permanently increase as a result of construction and operation of the Project. As previously mentioned, recent declines in populations of shrubland birds in the Northeast are a growing concern among avian conservationists. Consequently, any adverse impacts to woodland species would be mitigated to a large extent by benefits to shrubland bird species.

Creating a wider maintained ROW corridor than that which currently exists to accommodate the proposed new 345-kV transmission line would not be expected to adversely impact bird populations, and may benefit shrubland species that nest on the ROW. Studies of a 100-foot ROW in Massachusetts indicated nest predation was highest along the ROW/forest edge, and a wider ROW may therefore actually benefit shrubland-nesting species by providing more potential nesting sites away from the edge habitat (King and Byers 2002).

Once construction is completed and the Project is operational, routine vegetation management as currently practiced along existing CL&P transmission line ROWs would not significantly impact birds. Several studies have shown that vegetation management along ROWs, whether mechanical, herbicidal, or a combination thereof, does not have a significant adverse effect on bird populations so long as standard precautions are taken during herbicide application (Confer and Pascoe 2003; King and Byers 2002; Yahner et. al. 2002; Yahner et. al. 2003).

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Attachment A

**ADDENDUM: MANCHESTER TO MEEKVILLE JUNCTION CIRCUIT
SEPARATION PROJECT
SURVEY FOR POTENTIAL BARN OWL NESTING HABITAT**

Prepared For:

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September, 2008

Purpose and Summary of Results

This Addendum to the *Inventory of Potential Breeding Bird Species and Habitats* report documents the supplemental breeding bird surveys completed by ENSR Corporation (ENSR), on behalf of The Connecticut Light and Power Company (CL&P) along the route of the Manchester to Meekville Junction Circuit Separation Project, which is a component of CL&P's Greater Springfield Reliability Project. This Project, which would be located entirely within the Town of Manchester, Connecticut, would involve the separation of two existing transmission line circuits and the construction of new transmission line structures, all within an existing CL&P transmission line right-of-way (ROW).

CL&P received correspondence from the Connecticut Natural Diversity Data Base, Wildlife Division (CT NDDDB), dated April 24, 2008, indicating that there are historic records of a state-listed endangered species, the Barn Owl (*Tyto alba*), in the vicinity of the Project route. In response to the CT NDDDB's request for a breeding season survey of this species, ENSR wildlife biologists conducted three field surveys for potential Barn Owl nesting habitat along and near the project route. Fieldwork was conducted on April 16 and 17, 2008, and on May 8, 2008. The purpose of the surveys was to identify whether any potential Barn Owl nesting habitat occurs within the project ROW and, if so, whether such habitat would be potentially affected by the proposed project.

Biologists visually inspected the entire length of the approximately 2.2-mile transmission line route on foot for any potential Barn Owl nesting habitat, including large diameter trees with cavities, abandoned buildings, or any other suitable structure in proximity to grassy fields, old fields, or wet meadows. All avian species encountered during the surveys were recorded and are listed in Table 1. Biologists used Leupold 10X50 binoculars to identify birds during the survey.

No active Barn Owl nest sites or individuals were encountered at any time during the surveys. In addition, in ENSR's opinion, the ROW offers extremely limited foraging habitats for Barn Owls.

Table 1. Avian species encountered along the Manchester to Meekville Junction Circuit Separation Project Route - Manchester, CT, April and May, 2008		
Species	April 16 and 17, 2008	May 8, 2008
American Crow (<i>Corvus brachyrhynchos</i>)	X	X
American Goldfinch (<i>Carduelis tristis</i>)	X	X
American Robin (<i>Turdus migratorius</i>)	X	X
Baltimore Oriole (<i>Icterus galbula</i>)		X
Black-capped Chickadee (<i>Parus atricapillus</i>)	X	X
Blue-gray Gnatcatcher (<i>Polioptila caerulea</i>)	X	
Blue Jay (<i>Cyanocitta cristata</i>)	X	X
Blue-winged Warbler (<i>Vermivora pinus</i>)		X
Brown-headed Cowbird (<i>Molothrus ater</i>)	X	X
Canada Goose (<i>Branta canadensis</i>)	X	X
Carolina Wren (<i>Thryothorus ludovicianus</i>)	X	X
Common Grackle (<i>Quiscalus quiscula</i>)	X	X
Common Yellowthroat (<i>Geothlypis trichas</i>)		X
Cooper's Hawk (<i>Accipiter cooperii</i>)		X
Downy Woodpecker (<i>Picoides villosus</i>)	X	X
Eastern Phoebe (<i>Sayornis phoebe</i>)	X	X
Eastern Towhee (<i>Pipilo erythrophthalmus</i>)		X
European Starling (<i>Sturnus vulgaris</i>)	X	X
Field Sparrow (<i>Spizella pusilla</i>)	X	X
Gray Catbird (<i>Dumatella carolinensis</i>)		X
Green Heron (<i>Butorides virescens</i>)		X
Great Blue Heron (<i>Ardea Herodias</i>)	X	X
House Finch (<i>Carpodacus mexicanus</i>)	X	
House Sparrow (<i>Passer domesticus</i>)	X	
Killdeer (<i>Charadrius vociferous</i>)	X	
Mallard (<i>Anas platyrhynchos</i>)	X	X
Mourning Dove (<i>Zenaida macroura</i>)	X	X
Northern Cardinal (<i>Cardinalis cardinalis</i>)	X	X
Northern Flicker (<i>Colaptes auratus</i>)	X	X

Northern Mockingbird (<i>Mimus polyglottos</i>)		X
Northern Parula (<i>Parula americana</i>)		X
Red-bellied Woodpecker (<i>Melanerpes carolinus</i>)	X	X
Red-tailed Hawk (<i>Buteo jamaicensis</i>)		X
Rusty Blackbird (<i>Euphagus carolinus</i>)	X	
Red-winged Blackbird (<i>Agelaius phoeniceus</i>)	X	X
Song Sparrow (<i>Melospiza melodia</i>)	X	X
Saw-whet Owl, dead (<i>Aegolius acadicus</i>)	X	
Tree Swallow (<i>Tachycineta bicolor</i>)	X	
Tufted Titmouse (<i>Parus bicolor</i>)	X	
Warbling Vireo (<i>Vireo gilvus</i>)		X
White-throated Sparrow (<i>Zonotrichia albicollis</i>)	X	X
Wild Turkey (<i>Meleagris gallapavo</i>)	X	
Wood Duck (<i>Aix sponsa</i>)		X
Yellow Warbler (<i>Dendroica petechia</i>)	X	X

Overview of Barn Owl Characteristics

Barn owls are crow-sized and are characterized by a white, heart-shaped face, with no ear tufts and long legs. The birds range from 14-20 inches in length, weigh 14-25 ounces, and have a wingspan of approximately 41-47 inches.

Barn owls inhabit open areas such as old fields, grassy fields, wet meadows and wetland edges. They are often found in the vicinity of farms and rural towns and may roost in the daytime in evergreen trees, barns, belfries, hollow trees, and abandoned buildings. Primary food includes small mammals such as mice, shrews, and meadow voles, but may also include bats, skunks, and birds. Prime barn owl hunting habitats often include garbage dumps, cemeteries, and similar types of waste places with open, grassy areas. In the northeastern U.S., barn owls are considered partially migratory, as some individuals migrate south for the winter, while others remain in the area year-round.

Although found throughout North America, barn owls are not common in Connecticut, most likely because of the decline in the amount of grasslands and farms in the state. Transmission line ROWs, that are maintained in old field or grassy type vegetation, can potentially provide habitat for barn owls.

Manchester to Meekville Junction Circuit Separation Project Route Characteristics and Potential for Barn Owl Habitat

Habitat along the maintained portions of the this transmission line ROW is dominated primarily by shrub and sapling thickets interspersed with areas of grasses and forbs. Unmaintained sections of ROW are generally in a forested condition in both uplands and wetlands. Dominant plant species observed in the shrub and sapling habitats during the 2008 surveys included shrubs such as autumn olive (*Elaeagnus umbellata*), honeysuckle (*Lonicera* spp.), glossy buckthorn (*Rhamnus frangula*), brambles (*Rubus* spp.), multiflora rose (*Rosa multiflora*), and eastern red cedar (*Juniperus virginiana*). Herbaceous species included orchard grass (*Dactylis glomerata*), goldenrod (*Solidago* spp.), asters (*Aster* spp.), and common mullein (*Verbascum thapsus*). Areas dominated by shrub and sapling thickets are not considered suitable nesting or foraging habitat for barn owls.

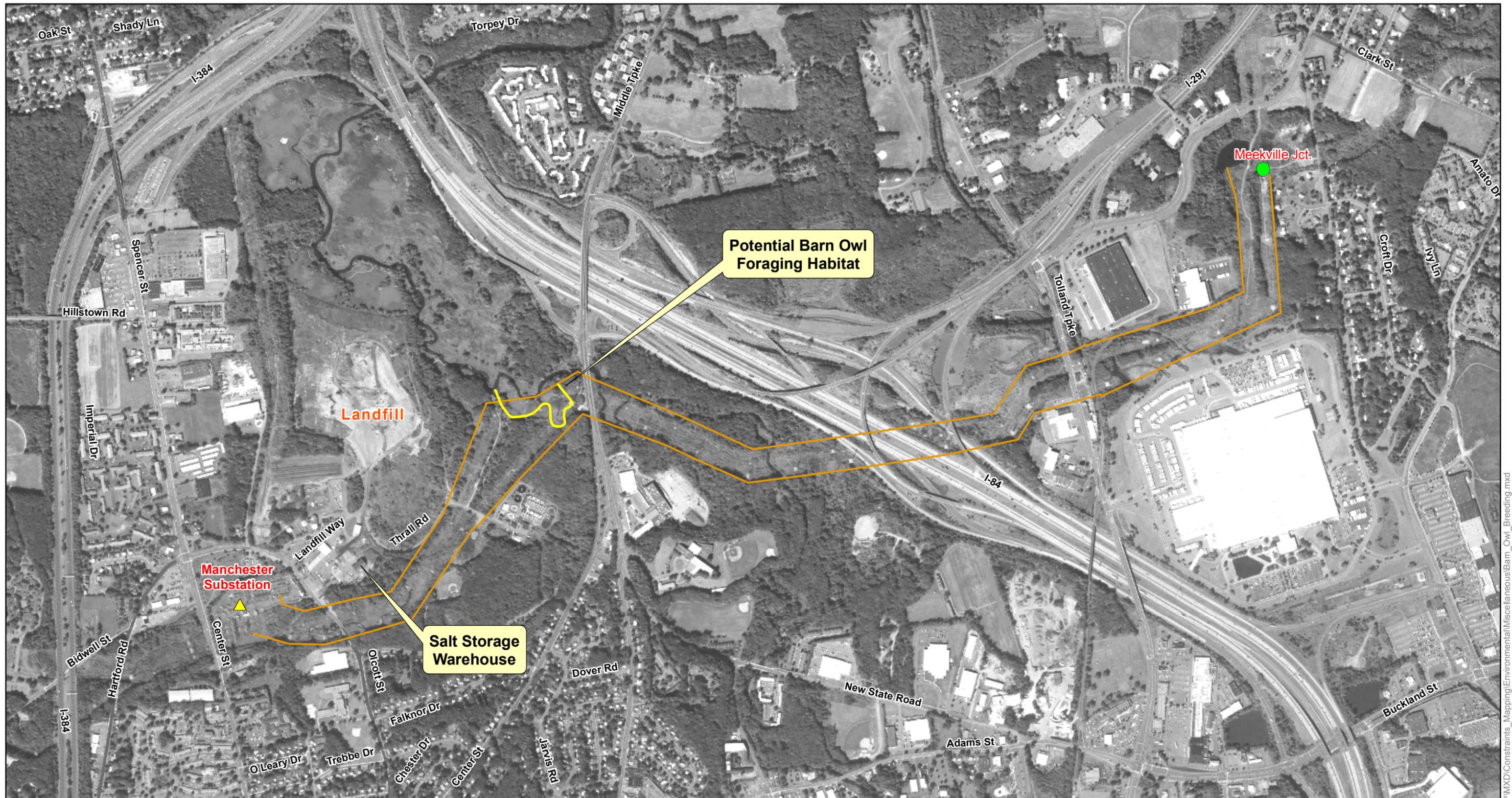
Two areas along the survey route not dominated by shrub and sapling thickets were identified as potential foraging habitat for Barn Owls, with only one being located within the CL&P transmission line ROW. The first area is a floodplain of the Hockanum River. It is a large wet meadow dominated by reed canary grass (*Phalaris arundinacea*), which may potentially be utilized by barn owls as hunting habitat. Although none were observed, large diameter trees with suitable cavities within nearby woods may also provide nest sites. This area is located just north of the confluence of Hop Brook and the Hockanum River, approximately 1,000 feet west of the municipal sewage treatment plant located off Thrall Road. The area is identified in Figure 1 as Potential Barn Owl Foraging Habitat.

The second potential area is the municipal landfill on Landfill Way, located immediately to the west and outside of the CL&P transmission line corridor. This area is also identified in Figure 1. This area contains suitable barn owl nesting habitat (a large, open sand and salt storage warehouse, with rafters) and foraging habitat (extensive areas of grassland at the landfill). In ENSR's opinion, this area is the most likely barn owl nesting habitat observed close to the route. The landfill and the warehouse are outside the

transmission line ROW and will not be affected by any construction work associated with the proposed Manchester to Meekville Junction Circuit Separation Project. Because the landfill is outside of the project ROW, ENSR did not conduct specific barn owl surveys in these areas.

Figure 1

Potential Barn Owl Foraging Habitat Location Map



Legend

- ▲ Substation
- Junction
- Right-of-Way (Existing)

Source: NAIP Imagery 2006

**Greater Springfield
Reliability Project**

Potential Barn Owl Foraging Habitat Location

Figure 1

Date: May 2008



**Connecticut
Light & Power**

The Northeast Utilities System

NEW ENGLAND
EAST  **WEST
SOLUTION**

**EX. 2: “Inventory of Vernal Pools and Amphibian Breeding Habitats
Along the Connecticut Portion of the Greater Springfield
Reliability Project” by ENSR**

INVENTORY OF VERNAL POOLS AND AMPHIBIAN BREEDING HABITATS
ALONG THE CONNECTICUT PORTION OF
THE GREATER SPRINGFIELD RELIABILITY PROJECT

Prepared For:

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Section 1.0 Introduction

This report provides a summary of vernal pool investigations conducted along the Connecticut portions of the proposed Greater Springfield Reliability Project (GSRP). The report has been generated to address Connecticut Siting Council application guidelines for terrestrial electric transmission line facilities. The GSRP consists of a proposed new 345-kilovolt (kV) electric transmission line and associated improvements to existing 115-kV lines, as well as the expansion and construction of switching and/or substations. Most of these proposed facilities are located along existing transmission line rights-of-way (ROWs).

The GSRP is proposed by the Connecticut Light and Power Company (CL&P) and the Western Massachusetts Electric Company (WMECO), which are owned and operated by Northeast Utilities Service Company (NUSCO). The project, the purpose of which is to ensure continued reliable electric power in southern New England, would extend between WMECO's Ludlow Substation in Ludlow, Massachusetts and CL&P's North Bloomfield Substation in Bloomfield, Connecticut.

The Connecticut Portion of the GSRP (i.e., the North Bloomfield to Agawam Line Route) would traverse the municipalities of Suffield, East Granby and Bloomfield along an existing transmission line ROW, within which overhead 115-kV transmission lines currently exist. The GSRP also includes the Manchester to Meekville Junction Circuit Separation Project, which is located in the municipality of Manchester and consists of a new transmission line to be constructed within an existing CL&P transmission line ROW that extends from Manchester Substation to Meekville Junction.

In addition, as required by the Massachusetts Energy Facilities Siting Board (EFSB), NUSCO identified and evaluated the Massachusetts Southern Route Alternative as an alternative route to the Agawam to Ludlow Substation alignment. The Connecticut Portion of the Massachusetts Southern Route Alternative would occupy 5.4-miles of an existing transmission line ROW through the municipalities of Enfield and Suffield before terminating in Agawam, Massachusetts.

Along the Connecticut Portion of the North Bloomfield to Agawam Line Route, the GSRP includes four underground cable route variations in the municipalities of East Granby and Suffield: the Newgate Road Underground Line Variation, the State Route 168/187 Underground Line Variation, the 3.6-Mile in ROW Underground Line Variation and the 4.6-Mile in ROW Underground Line Variation. Along the Connecticut Portion of the Massachusetts Southern Route Alternative in Enfield, the GSRP project also includes one underground cable route variation, known as the Connecticut Portion of the Massachusetts Southern Route Alternative Underground Line Variation.

On behalf of CL&P and WMECO, ENSR conducted vernal pool surveys along all of the proposed GSRP routes and variations described above. These field investigations were conducted in the spring of 2008. This report discusses the field methods used to identify vernal pools and summarizes the findings of the surveys.

Section 2.0 Vernal Pool Determination and Identification Methods

The Connecticut Department of Environmental Protection (CT DEP) defines vernal pools as small bodies of standing fresh water found throughout the spring that typically result from various combinations of snowmelt, precipitation and high water tables associated with the spring season. These depressions can be natural or man-made (CT DEP 2008). In most years, these areas become completely dry, losing water through infiltration and evapotranspiration. Vernal pools vary in many aspects including appearance, water source, hydroperiod, water quality and surrounding habitats. Field investigations must coincide with the amphibian breeding and/or larval development time periods to determine if an area is functioning as a vernal pool.

In Connecticut, per the definition of a vernal pool, the following four criteria must be met:

- It contains water for approximately two months during the growing season;
- It occurs within a confined depression or basin that lacks a permanent outlet stream;
- It lacks any fish populations;
- It dries out most years, usually by late summer.

Many organisms critically rely upon vernal pool habitat for reproductive success, and these species are referred to as obligate vernal pool species. According to the CT DEP (2008), obligate vernal pool species that may have ranges within the project area include the following:

- wood frog (*Rana sylvatica*)
- spotted salamander (*Ambystoma maculatum*)
- Jefferson salamander (*Ambystoma jeffersonianum*)
- marbled salamander (*Ambystoma opacum*)
- fairy shrimp (*Branchiopoda anostraca*)

Facultative vernal pool species are fauna that utilize, but do not necessarily require, vernal pools for reproductive success. Examples of facultative species include spring peepers (*Pseudacris crucifer*), spotted turtles (*Clemmys guttata*), and red-spotted newts (*Notophthalmus viridescens viridescens*).

All wetland areas associated with the Connecticut GSRP routes were studied to identify the presence or absence of obligate vernal pool species (presence/absence surveys). Where obligate species were observed, the area was further investigated to identify whether Connecticut's vernal pool criteria had been satisfied. Observed facultative species were noted on the Vernal Pool Data Forms (See Attachment C), but these species were not used to quantify whether or not the area was a vernal pool. If an area had facultative species only, it was classified as amphibian breeding habitat but not a vernal pool.

For the purposes of this report, a vernal pool was defined as an area that held obligate species in the 2008 breeding season and that met the majority of the vernal pool criteria. "Amphibian breeding habitat" refers to areas in which signs of amphibians, both obligate and facultative, have been observed, but the overall habitat of the area did not meet the specific vernal pool criteria. These distinctions were made by field biologists on site

during the surveys in 2008. For the Connecticut component of the GSRP, all areas where amphibians were observed to be breeding were given vernal pool status. There were no areas identified specifically as, “amphibian breeding habitat”.

ENSR conducted the vernal pool/amphibian breeding habitat surveys in March and April of 2008. The surveys were conducted during the optimum time to identify areas that function as vernal pools and/or amphibian breeding habitat. This is after the first significant rain events in the spring, when evening low temperatures remain in the 40s (° Fahrenheit). Biologists conducted visual surveys and used dip nets to sweep the water column to determine the presence or absence of vernal pool species. Choruses of breeding frogs were also noted for each wetland. Representative photographs of the wetlands and observed species were taken at the majority of the identified vernal pools/amphibian breeding habitat (Attachment B, Site Photographs).

Section 3.0 Results

As illustrated in Table 1, during the 2008 breeding season, portions of seventeen wetlands on the Connecticut Portion of the North Bloomfield to Agawam Line Route were determined to function as vernal pool habitat, portions of two wetlands along the Connecticut Portion of the Massachusetts Southern Route Alternative were determined to function as vernal pool habitat, and portions of two wetlands along the Manchester to Meekville Junction Circuit Separation Project were determined to function as vernal pool habitat. For the In ROW Underground Line Variations, a portion of four wetlands have been identified as functioning as vernal pool habitat. However, these wetlands are also associated with the Connecticut Portion of the North Bloomfield to Agawam Line Route and have been accounted for under that route description. Two of these occur on the 3.6-Mile in ROW Underground Line Variation. These two wetlands, and an additional two wetlands, which occur on the 4.6-Mile in ROW Underground Line Variation have also been identified as functioning as vernal pool habitat. No wetlands were determined to function as vernal pool habitat along the Newgate Road, State Route 168/187, or Connecticut Portion of the Massachusetts Southern Route Alternative Underground Line Variations.

Attachment A contains digital aerial mapping detailing the delineated wetlands and identifying the vernal pools/amphibian breeding habitat. Representative photographs of identified vernal pools and biological evidence can be found in Attachment B. Finally, Attachment C contains Vernal Pool Data Forms.

Table 1 Confirmed Vernal Pool Habitat Associated with the GSRP in Connecticut				
Municipality	Wetland Series Number ¹	CL&P Wetland Number	Adjacent Tower Number	Observed Obligate Species ²
Connecticut Portion of the North Bloomfield to Agawam Line Route				
East Granby	W04HF003	W9-222	3149	spotted salamander, marbled salamander, wood frog, finger nail clams, fairy shrimp
East Granby	W04HF004	W9-223	3150 to 3151	spotted salamander, Jefferson salamander
East Granby	W04HF005	W9-224	3153 to 3154	spotted salamander, Jefferson salamander

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Table 1 Confirmed Vernal Pool Habitat Associated with the GSRP in Connecticut				
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East Granby	W07HF019	W9-225	3158	spotted salamander, wood frog
East Granby	W07HF011	W9-232A	3166	spotted salamander, wood frog
East Granby	W07HF007	W9-236	3167	wood frog
East Granby	W07HF003	W9-241	3174	spotted salamander, wood frog
East Granby	W07HF002	W9-242	3175	spotted salamander
East Granby	W07HF001	W9-243	3178 to 3180	spotted salamander, wood frog
East Granby	W01HF001	W9-244	3181 to 3183	spotted salamander, wood frog
East Granby	W01HF006	W9-249	3189	spotted salamander, fairy shrimp
East Granby	W01HF010	W9-253	3193	wood frog
Suffield	W01HF020	W9-263	3230 to 3231	spotted salamander, wood frog
Suffield	W01HF021	W9-264	3232	wood frog
Suffield	W01HF022	W9-265	3236 to 3238	spotted salamander, wood frog
Suffield	W01HF024	W9-267	3243	spotted salamander, wood frog
Suffield	W01HF025	W1-1	3246	spotted salamander, wood frog
3.6-Mile in ROW Underground Line Variation				
East Granby	W01HF006	W9-249	3189	spotted salamander, fairy shrimp
East Granby	W01HF010	W9-253	3193	wood frog
4.6-Mile in ROW Underground Line Variation				
East Granby	W07HF001	W9-43	3178 to 3179	spotted salamander
East Granby	W07HFH001	W9-244	3181 to 3183	spotted salamander, wood frog
East Granby	W01HF006	W9-249	3189	spotted salamander, fairy shrimp
East Granby	W01HF010	W9-253	3193	wood frog
Connecticut Portion of the Massachusetts Southern Route Alternative				
Enfield	W04HD035	W8-151	22023	wood frog
Enfield	W04HD055	W8-156A	22058	spotted salamander, wood frog
Manchester to Meekville Junction Circuit Separation Project				
Manchester	W01HF003	W15-504	20007	spotted salamander, wood frog
Manchester	W88HA013	W15-507	20010	wood frog larvae

1: Wetland series number generated by ENSR to identify wetlands within and adjacent to the Project corridor;
2: Vernal Pool Species observed confirming vernal pool habitat.

Section 4.0 Conclusion

The Connecticut Portion of the North Bloomfield to Agawam Line Route of the GSRP encompasses seventeen wetlands, a portion of which have been identified as functioning as vernal pool habitat. The Connecticut Portion of the Massachusetts

Southern Route Alternative of the GSRP encompasses two additional wetlands which function as vernal pool habitat, and two wetlands were determined to function as vernal pool habitat along the Manchester to Meekville Junction Circuit Separation Project. No wetlands were determined to function as vernal pools along the Newgate Road, State Route 168/187, or Connecticut Portion of the Massachusetts Underground Line Variations. For the In ROW Underground Variations, a portion of four wetlands have been identified as functioning as vernal pool habitat. However, these wetlands are also associated with the Connecticut Portion of the North Bloomfield to Agawam Line Route and have been accounted for under that route description. Two of these occur on the 3.6-Mile in ROW Underground Line Variation. These two wetlands, and an additional two wetlands, that occur on the 4.6-Mile in ROW Underground Line Variation have also been identified as functioning as vernal pool habitat.

In areas where GSRP construction activities would be required in or near the identified amphibian breeding habitat, CL&P would implement measures to minimize the potential for adverse effects on amphibian breeding and/or reproductive success. Such measures would be defined in consultation with the CT DEP.

Section 5.0 References

Cowardin, L. M., V. Carter, F. C. Golet, E. T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U. S. Department of the Interior, Fish and Wildlife Service, Washington, D.C.

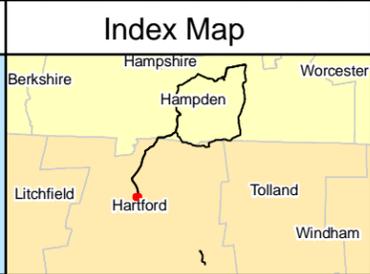
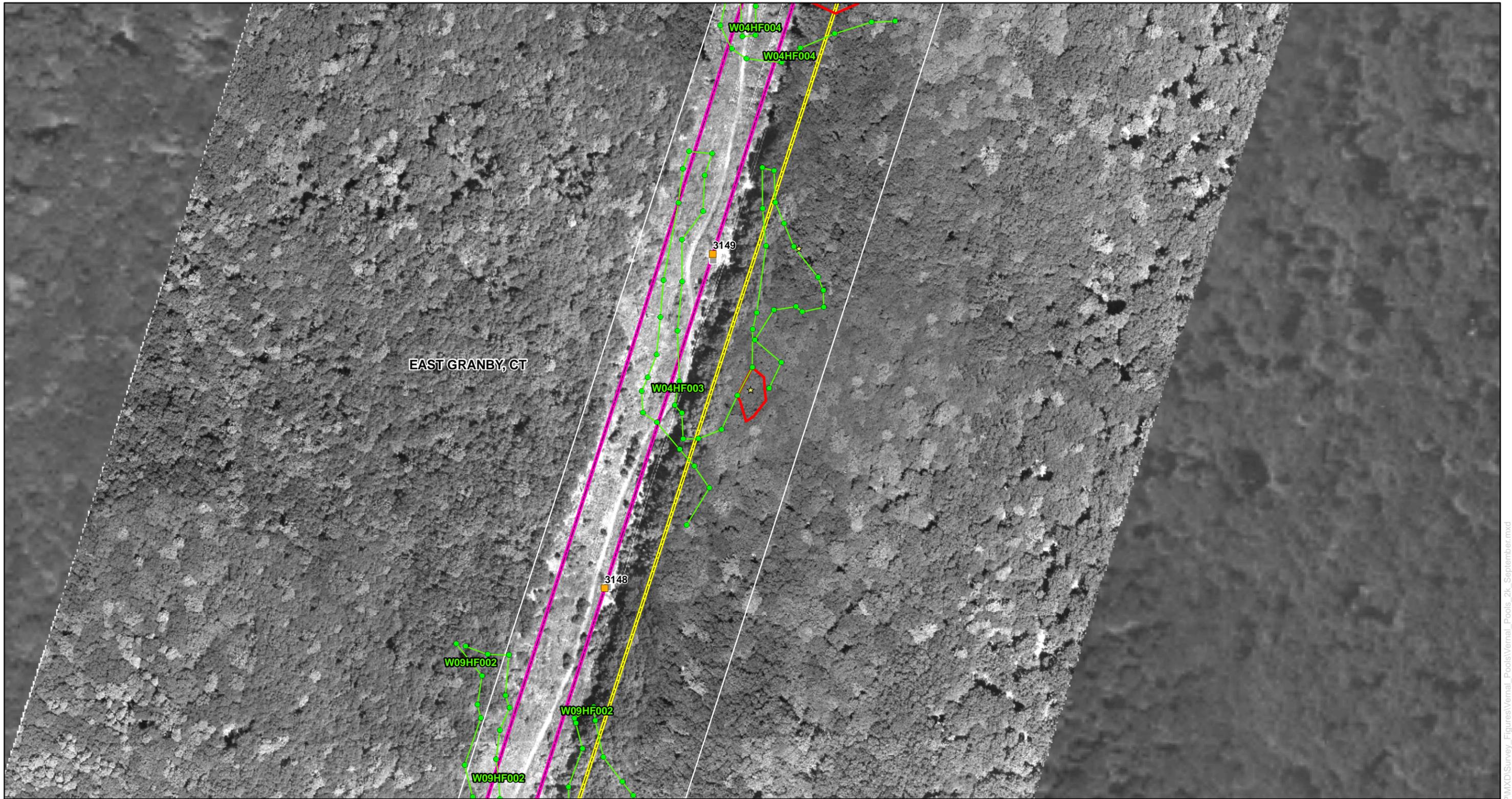
Durand, J., B. Windmiller, and F.P. Richards, "*In Press*", Vernal Pool Identification and Protection - Current and Future Permitting Implications, 8th International Symposium on Environmental Concerns in Rights-of-Way Management, Saratoga Springs, NY, September 2004.

Kenny, L.P. and M.R. Burne. 2001. A Field Guide to the animals of Vernal Pools. Natural Heritage and Endangered Species Program, MA Division of Fisheries and Wildlife, Westborough, Massachusetts.

Town of Suffield, Conservation Commission, Regulations of the Suffield Conservation Commission Regulations, 2007.

Attachment A

Vernal Pool Habitat Mapping



<ul style="list-style-type: none"> ■ Substation ● Junction ● Switching Station ■ Existing ROW — Confirmed Vernal Pool Habitat - - - 345-kV Underground Variation 	<ul style="list-style-type: none"> ■ Existing Structure ● Water Flag ● Wetland Flag ● MAHW Flag ★ Photo — Existing Transmission Line — Proposed Transmission Line 	<ul style="list-style-type: none"> ▲ ROW Access ◆ Access Road Flag ▲ Man-made Feature ▲ Natural Feature ● Generic Point 	<ul style="list-style-type: none"> — MAHW Line — Wetland Line — Water_Li — Access Road Line — Generic Line
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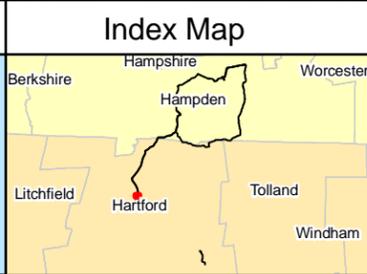
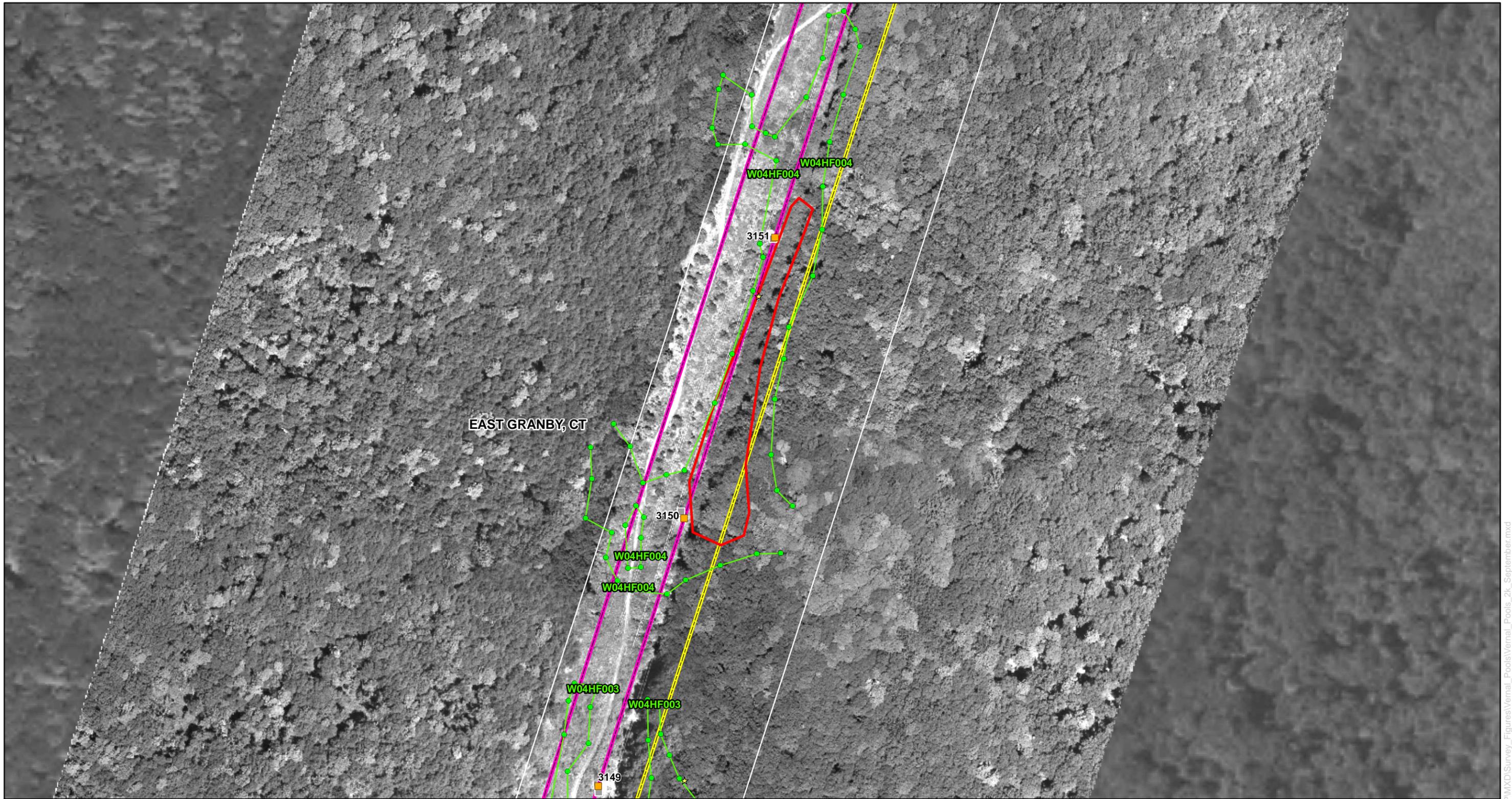
ENSR Survey: Summer, Fall 2007

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<p>Connecticut Light & Power The Northeast Utilities System</p>
Project Number: 01131-001 Date: September 2008

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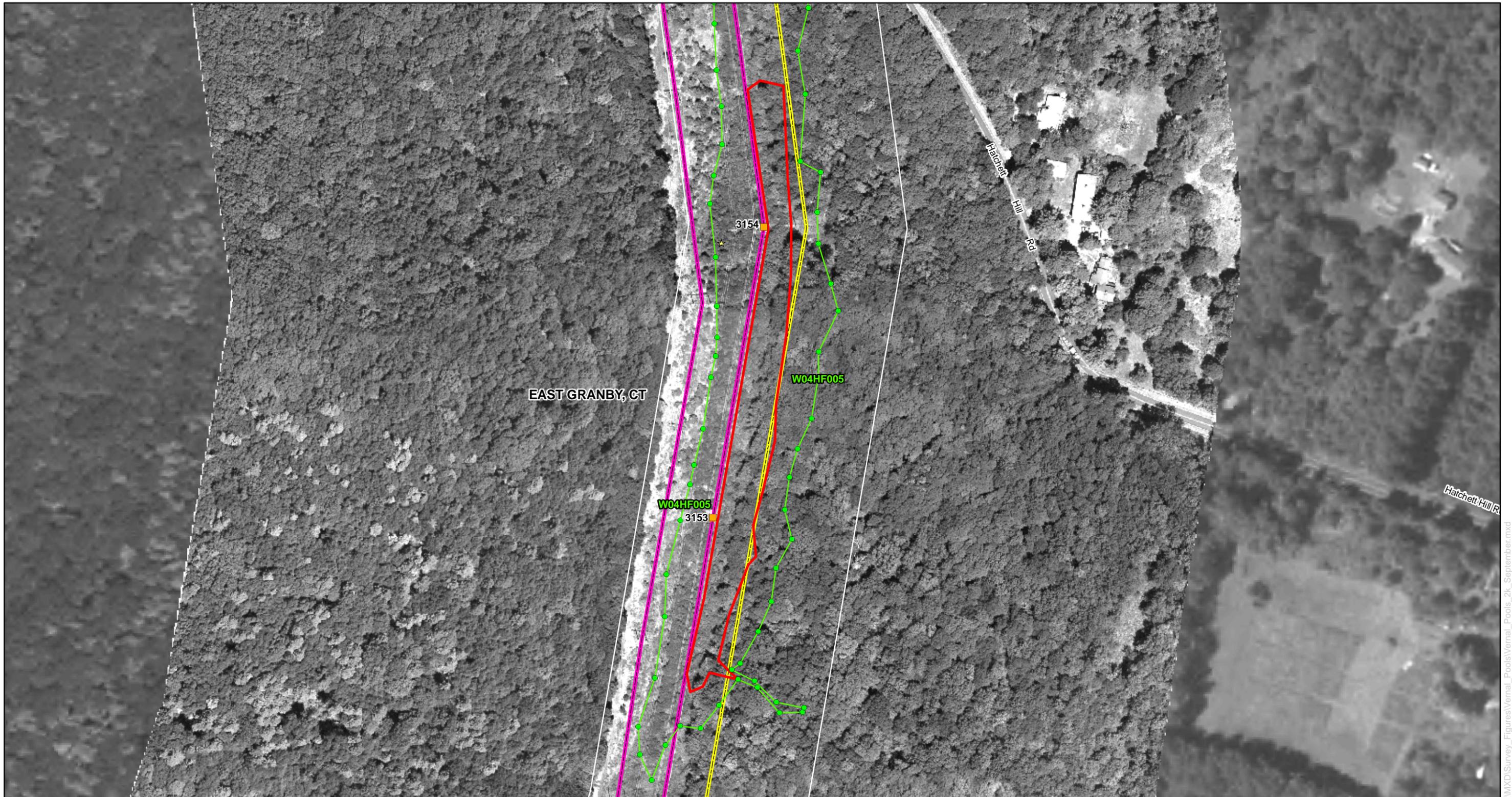
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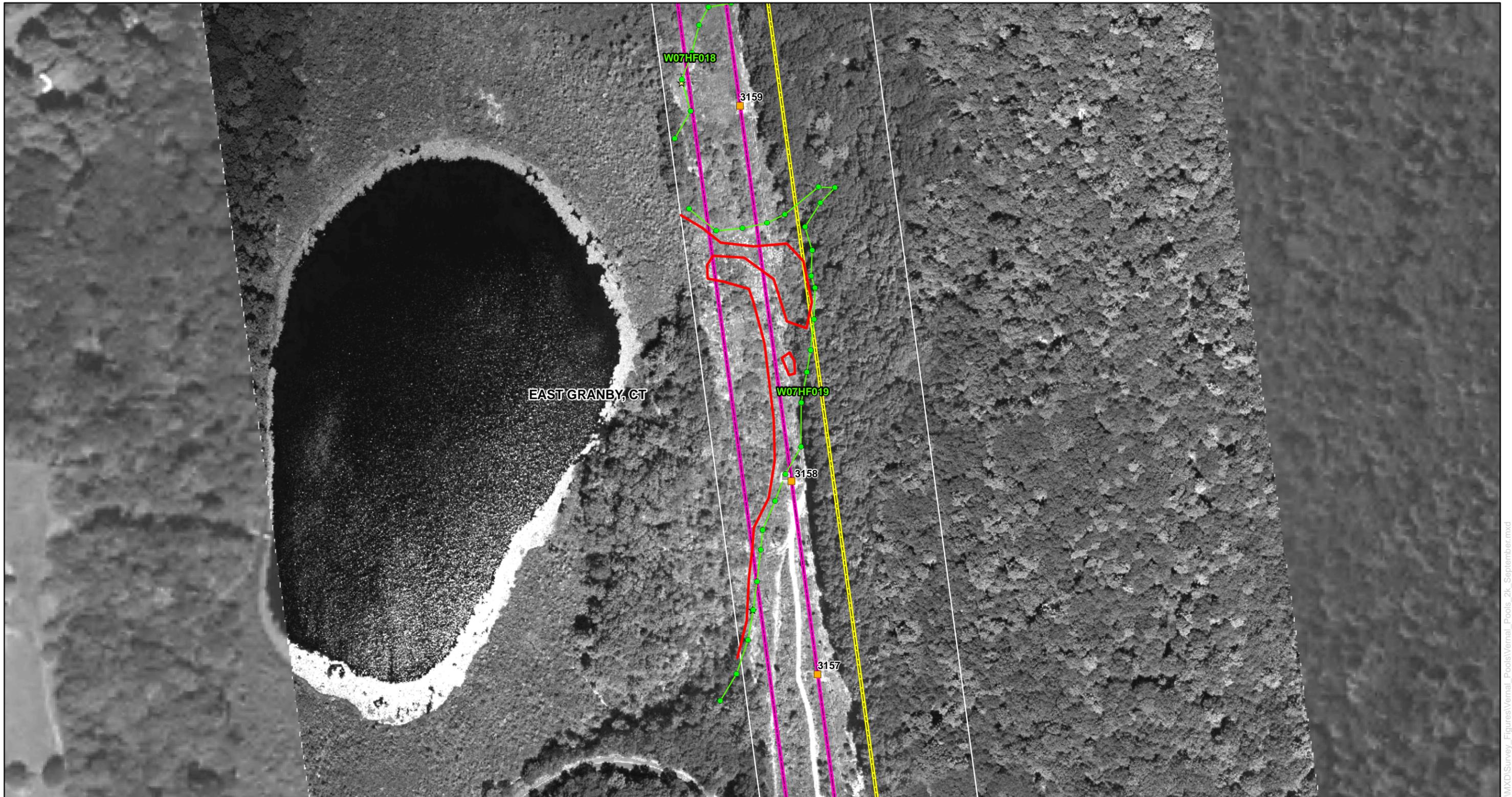
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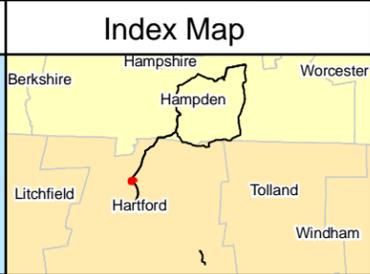


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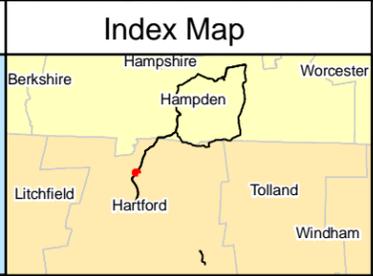
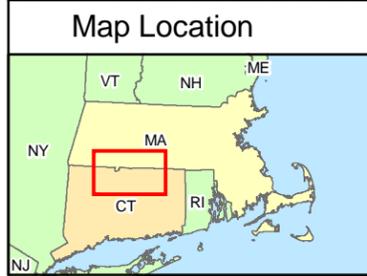
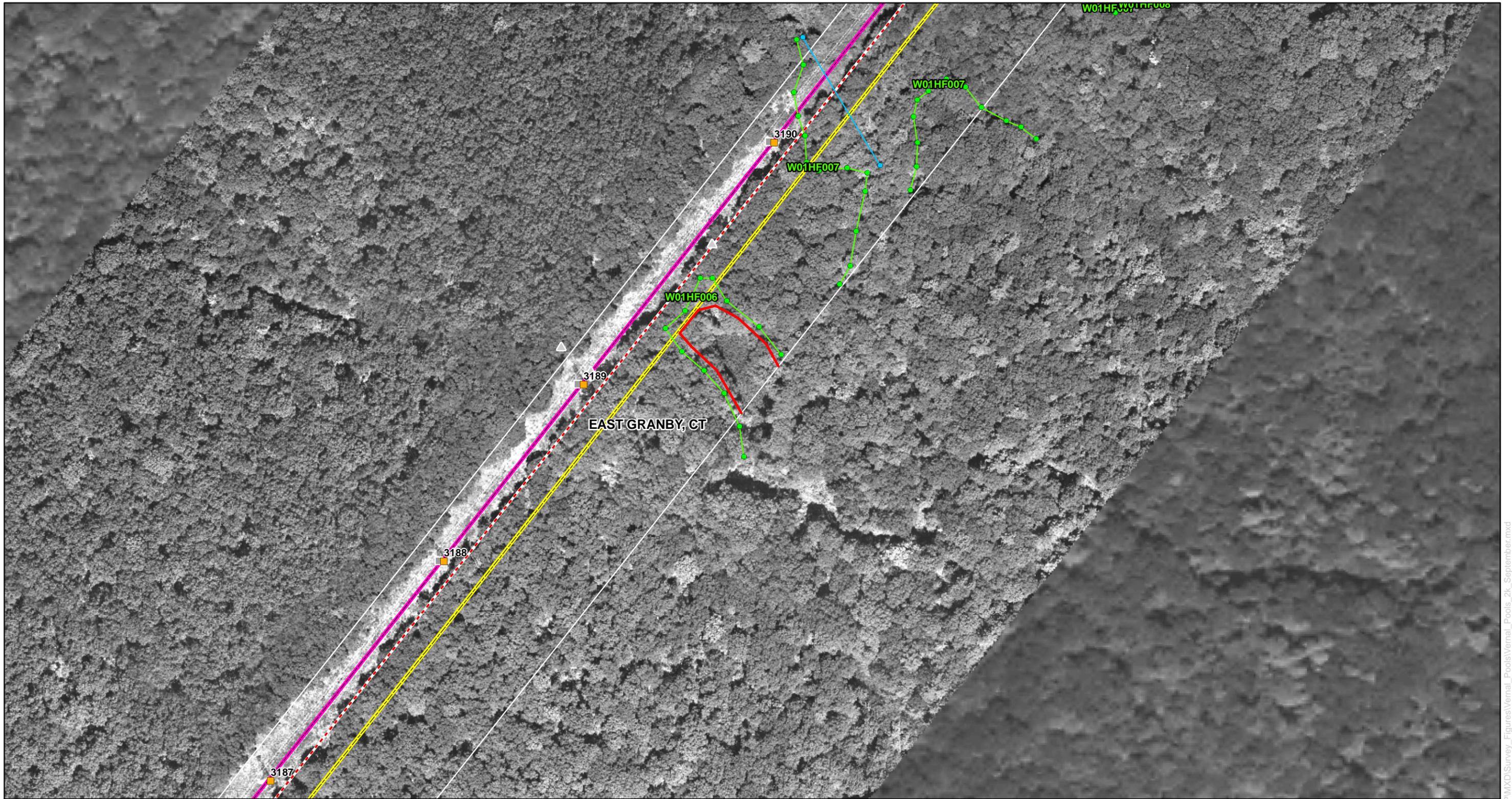
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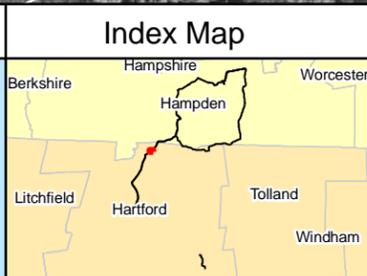
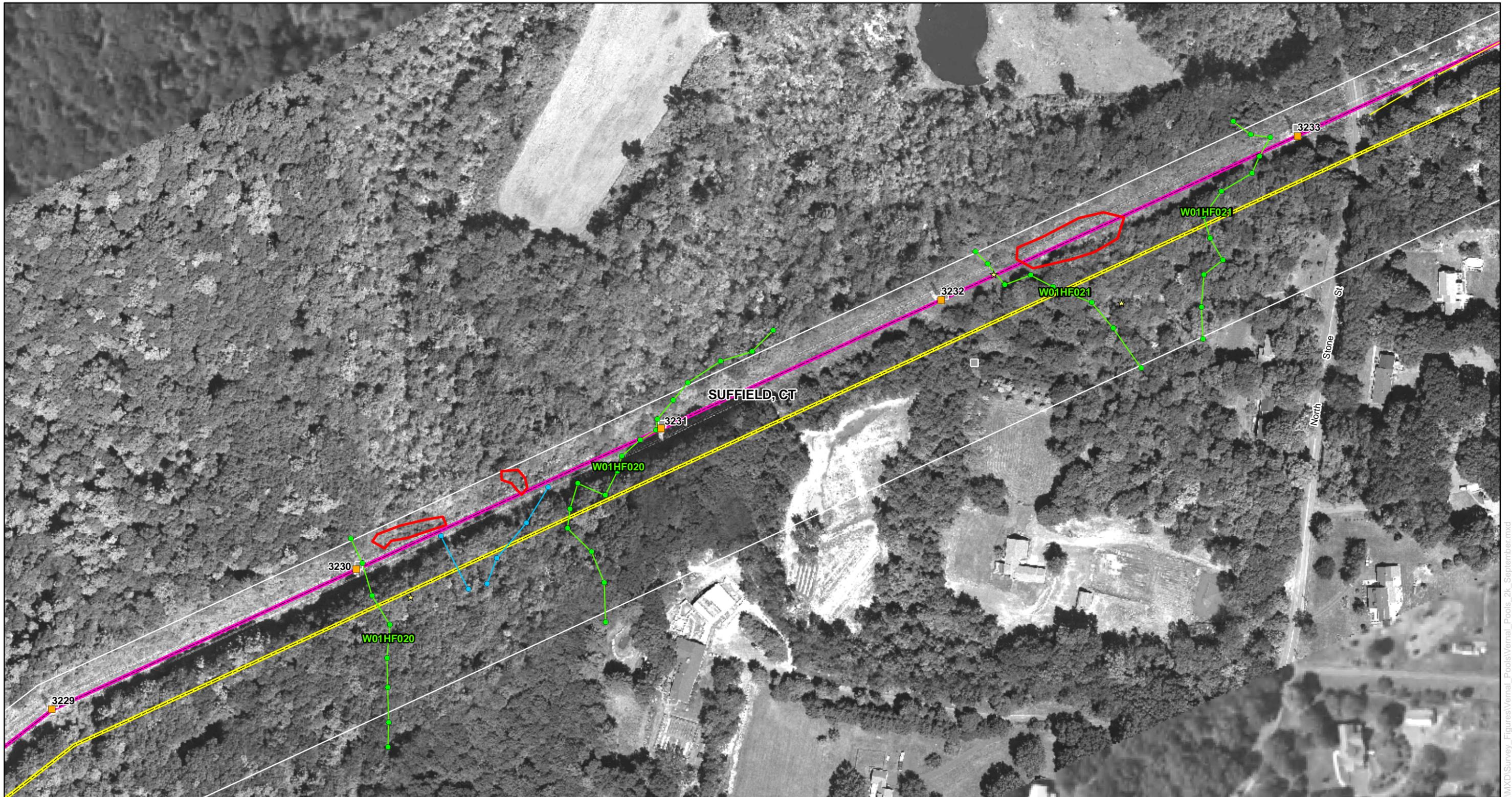
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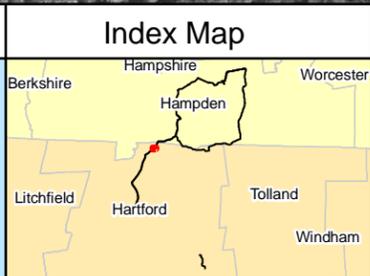
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Date: September 2008

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<ul style="list-style-type: none"> ■ Substation ● Junction ● Switching Station ■ Existing ROW — Confirmed Vernal Pool Habitat - - - 345-kV Underground Variation 	<ul style="list-style-type: none"> ■ Existing Structure ● Water Flag ● Wetland Flag ● MAHW Flag ★ Photo 	<ul style="list-style-type: none"> ▲ ROW Access ◆ Access Road Flag ▲ Man-made Feature ▲ Natural Feature ● Generic Point 	<ul style="list-style-type: none"> — MAHW Line — Wetland Line — Water_Li — Access Road Line — Generic Line — Existing Transmission Line — Proposed Transmission Line
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0 200 400 Feet 1:2000 1" = 167'

ENSR Survey: Summer, Fall 2007

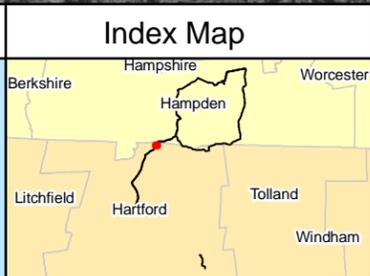
Greater Springfield Reliability Project
Confirmed Vernal Pool Habitats

 CT Mapsheet 12 of 18

Connecticut Light & Power
The Northeast Utilities System

ENSR | AECOM

Project Number: 01131-001
Date: September 2008



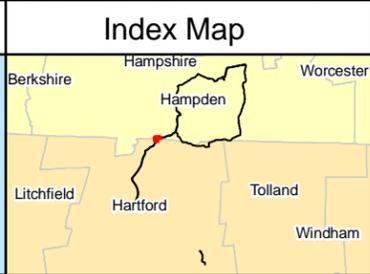
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<ul style="list-style-type: none"> — Existing Transmission Line — Proposed Transmission Line 		<p>0 200 400 Feet</p> <p>1:2000 1" = 167'</p> <p>ENSR Survey: Summer, Fall 2007</p>	

Greater Springfield Reliability Project
 Confirmed Vernal Pool Habitats

 CT Mapsheet 13 of 18

<p style="font-size: small;">The Northeast Utilities System</p>
<p style="font-size: x-small;">Project Number: 01131-001</p> <p style="font-size: x-small;">Date: September 2008</p>

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<ul style="list-style-type: none"> ■ Substation ● Junction ● Switching Station ■ Existing ROW — Confirmed Vernal Pool Habitat - - - 345-kV Underground Variation 	<ul style="list-style-type: none"> ■ Existing Structure ● Water Flag ● Wetland Flag ● MAHW Flag ★ Photo 	<ul style="list-style-type: none"> ▲ ROW Access ◆ Access Road Flag ▲ Man-made Feature ▲ Natural Feature ● Generic Point — Existing Transmission Line — Proposed Transmission Line 	<ul style="list-style-type: none"> — MAHW Line — Wetland Line — Water_Li — Access Road Line — Generic Line
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0 200 400 Feet 1:2000 1" = 167'

ENSR Survey: Summer, Fall 2007

Greater Springfield Reliability Project
Confirmed Vernal Pool Habitats

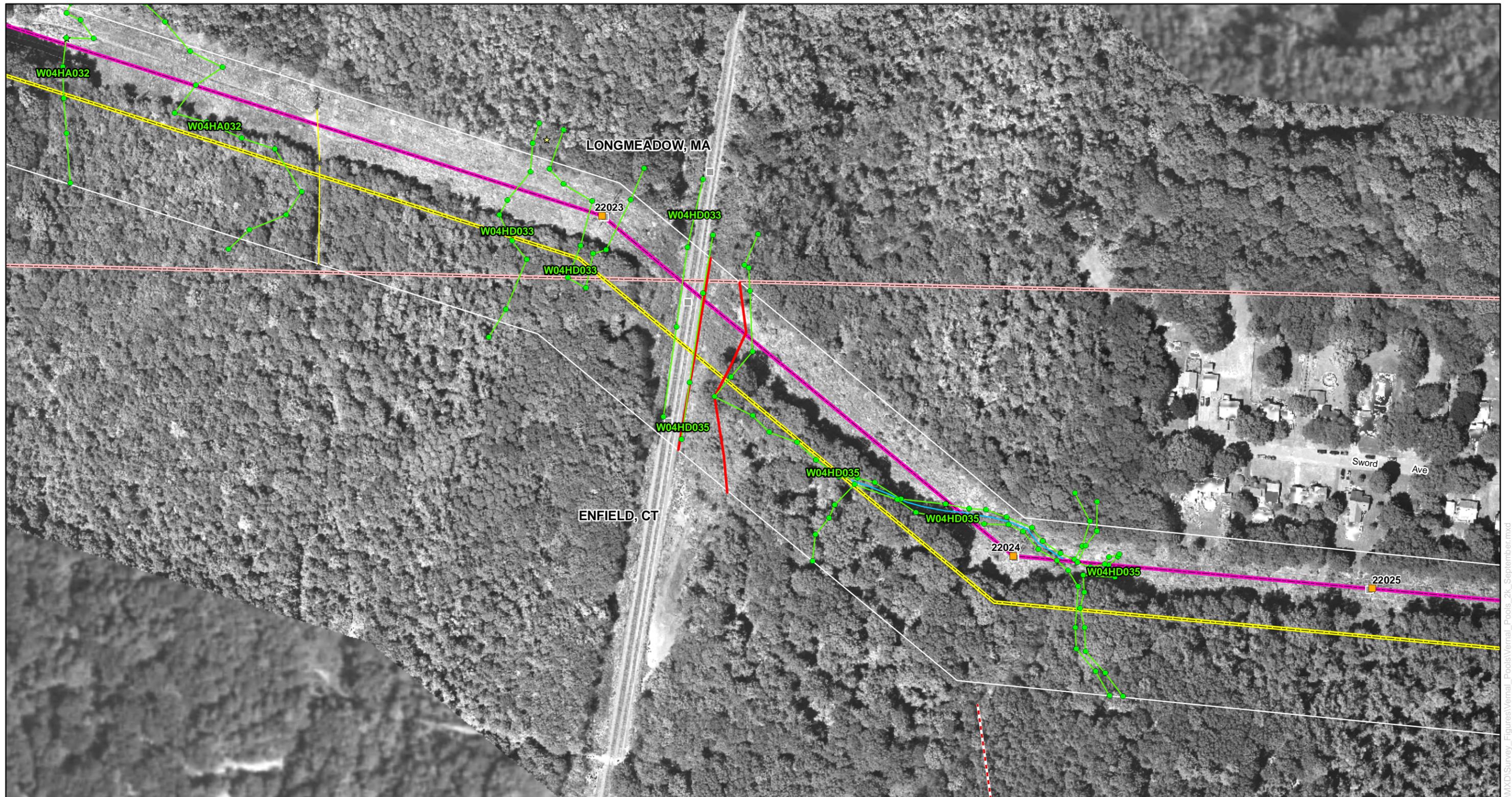
CT Mapsheet 14 of 18

Connecticut Light & Power
The Northeast Utilities System

Project Number: 01131-001

Date: September 2008

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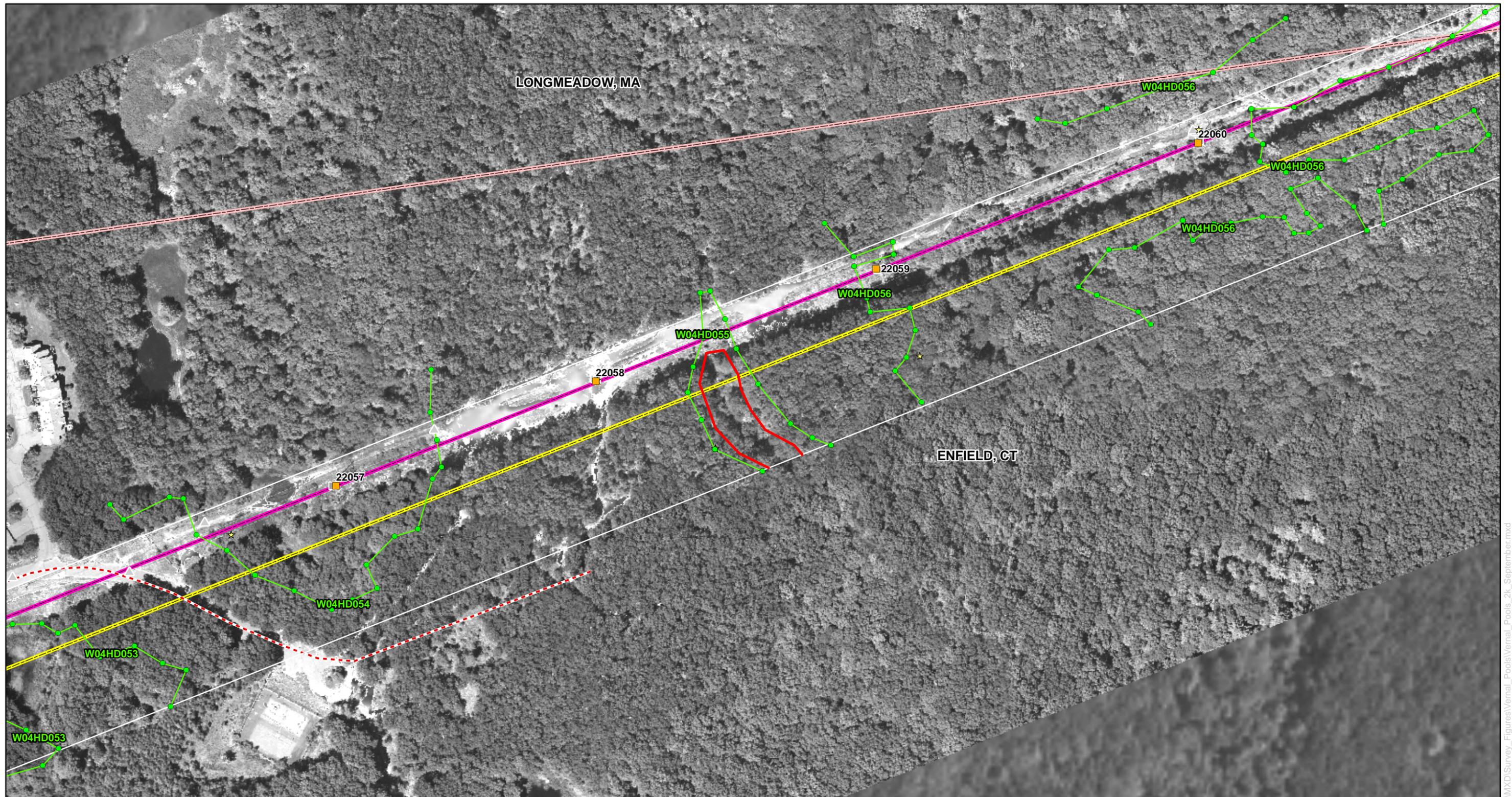


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<ul style="list-style-type: none"> — Existing Transmission Line — Proposed Transmission Line 		<p>0 200 400 Feet</p> <p>1:2000 1" = 167'</p> <p>ENSR Survey: Summer, Fall 2007</p>	

Greater Springfield Reliability Project
Confirmed Vernal Pool Habitats
 CT Mapsheet 15 of 18

<p style="font-size: small;">The Northeast Utilities System</p>
<p>Project Number: 01131-001</p> <p>Date: September 2008</p>

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<ul style="list-style-type: none"> ■ Substation ● Junction ● Switching Station ■ Existing ROW — Confirmed Vernal Pool Habitat - - - 345-kV Underground Variation 	<ul style="list-style-type: none"> ■ Existing Structure ● Water Flag ● Wetland Flag ● MAHW Flag ★ Photo 	<ul style="list-style-type: none"> ▲ ROW Access ◆ Access Road Flag ▲ Man-made Feature ▲ Natural Feature ● Generic Point 	<ul style="list-style-type: none"> — MAHW Line — Wetland Line — Water_Li — Access Road Line — Generic Line
<ul style="list-style-type: none"> — Existing Transmission Line — Proposed Transmission Line 	<p>0 200 400 Feet 1:2000 1" = 167'</p> <p>ENSR Survey: Summer, Fall 2007</p>		

Greater Springfield Reliability Project
 Confirmed Vernal Pool Habitats

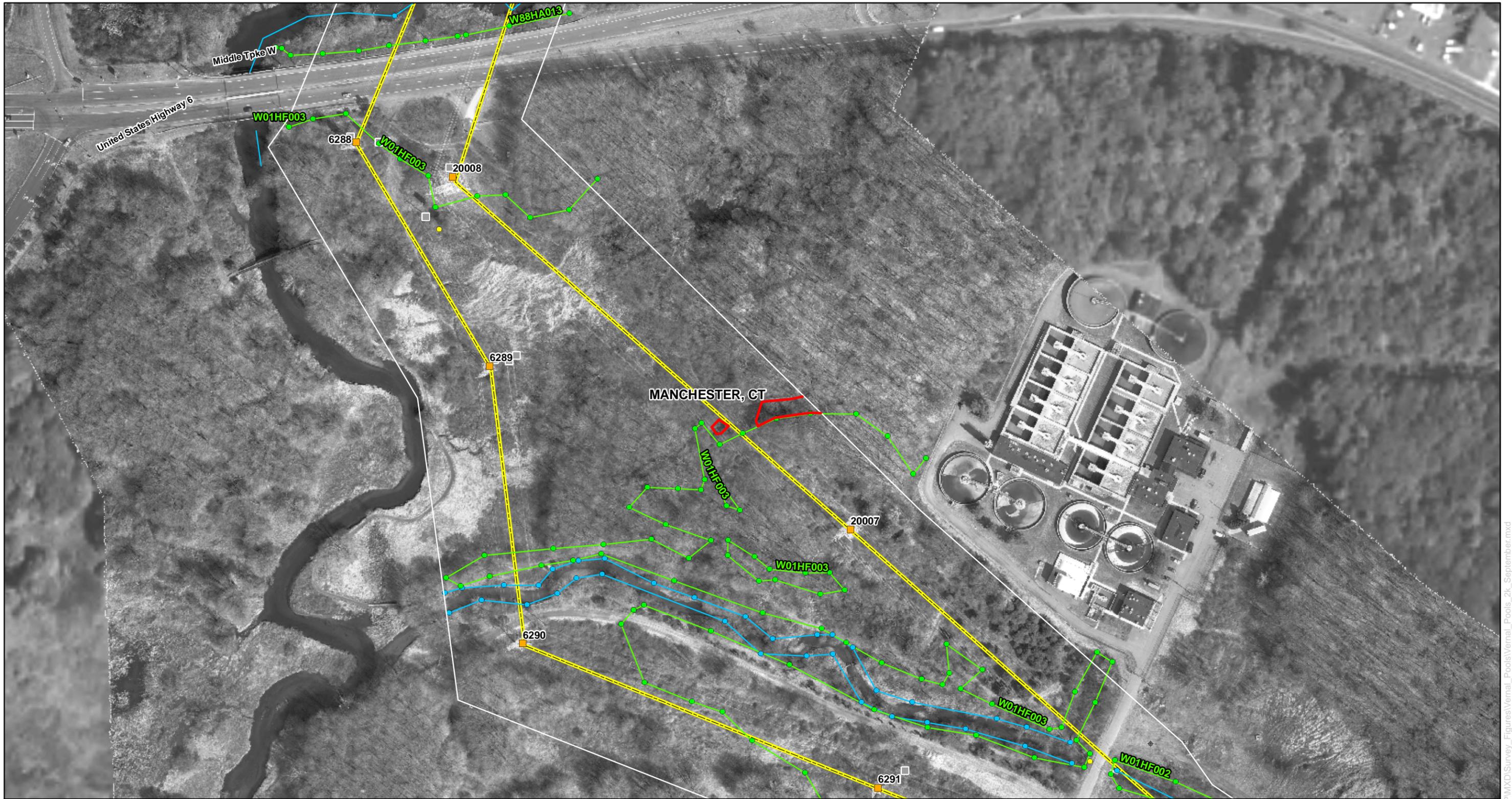
 CT Mapsheet 16 of 18

Connecticut Light & Power
The Northeast Utilities System

ENSR | AECOM

Project Number: 01131-001
Date: September 2008

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<ul style="list-style-type: none"> Substation Junction Switching Station Existing ROW Confirmed Vernal Pool Habitat 345-kV Underground Variation 	<ul style="list-style-type: none"> Existing Structure Water Flag Wetland Flag MAHW Flag Photo Existing Transmission Line Proposed Transmission Line 	<ul style="list-style-type: none"> ROW Access Access Road Flag Man-made Feature Natural Feature Generic Point 	<ul style="list-style-type: none"> MAHW Line Wetland Line Water_Li Access Road Line Generic Line
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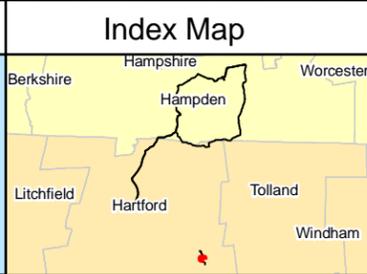
0 200 400 Feet 1:2000 1" = 167'

ENSR Survey: Summer, Fall 2007

Greater Springfield Reliability Project
Confirmed Vernal Pool Habitats
 CT Mapsheet 17 of 18

<p>Connecticut Light & Power The Northeast Utilities System</p>
Project Number: 01131-001 Date: September 2008

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<ul style="list-style-type: none"> ■ Substation ● Junction ● Switching Station ■ Existing ROW — Confirmed Vernal Pool Habitat - - - 345-kV Underground Variation 	<ul style="list-style-type: none"> ■ Existing Structure ● Water Flag ● Wetland Flag ● MAHW Flag ★ Photo 	<ul style="list-style-type: none"> ▲ ROW Access ◆ Access Road Flag ▲ Man-made Feature ▲ Natural Feature ● Generic Point 	<ul style="list-style-type: none"> — MAHW Line — Wetland Line — Water_Li — Access Road Line — Generic Line
<ul style="list-style-type: none"> — Existing Transmission Line — Proposed Transmission Line 		<p>0 200 400 Feet</p> <p>1:2000 1" = 167'</p> <p>ENSR Survey: Summer, Fall 2007</p>	

Greater Springfield Reliability Project
Confirmed Vernal Pool Habitats

 CT Mapsheet 18 of 18

<p style="font-size: small;">The Northeast Utilities System</p>
<p style="font-size: x-small;">Project Number: 01131-001</p> <p style="font-size: x-small;">Date: September 2008</p>

Attachment B

Vernal Pool Representative Photographs



Vernal Pool at Wetland W04HF003 (W9-222), view north.



Vernal Pool at Wetland W04HF004 (W9-223), view northwest.



Vernal Pool at Wetland W04HF005 (W9-224), view northwest.



Vernal Pool at Wetlands W07HF019 (W9-225), view west.



Vernal Pool at Wetland W7HF011 (W9-232A), view south.



Vernal Pool at Wetland W07HF007 (W9-236), view west.

Vernal Pool and Amphibian Breeding Habitat Report
Greater Springfield Reliability Project – Connecticut Portion



Vernal Pool at Wetland W07HF003 (W9-241), view southeast.



Vernal Pool at Wetland W07HF002 (W9-242), view east.



Vernal Pool 1 at Wetland W07HF001 (W9-243)



Vernal Pool 2 at Wetland W07HF001 (W9-243), view northwest



Vernal Pool 1 at Wetland W01HF001 (W9-244), view northwest.



Vernal Pool 2 at Wetland W01HF001 (W9-244), view north.



Vernal Pool at Wetland W01HF006 (W9-249), view east.



Vernal Pool at Wetland W01HF010 (W9-253), view northeast.



Vernal Pool 1 at Wetland W01HF020 (W9-263), view southeast.



Vernal Pool 2 at Wetland W01HF020 (W9-263), view north east.



Vernal Pool at Wetland W01HF021 (W9-264), view north.



Vernal Pool 01 at Wetland W01HF022 (W9-265), view north.



Vernal Pool 02 Wetland W01HF022 (W9-265), view north.



Vernal Pool at Wetland W01HF024 (W9-367), view west.



Vernal Pool at Wetland W01HF025 (W1-1), view north.



Vernal Pool at Wetland W04HA026 (W8-142), view east.



Wood frog egg mass in Vernal Pool at Wetland W04HA026 (W8-142).



Vernal Pool at Wetland W04HD035 (W8-151), view east.



Vernal Pool at Wetland W04HD055 (W8-156A), view north.



**Wood frog egg mass (top), spotted salamander egg mass (bottom) in pool
at Wetland W04HD055 (W8-156A)**



Vernal Pool at Wetland W01HF003 (W15-504)

Attachment C

Vernal Pool Data Forms

**VERNAL POOL DATA FORM
2008 FIELD SEASON**

PROJECT	GSRP CT		
DATE	3/31/08	WEATHER	40°, Rain, light breeze
OBSERVERS	S.O.H + D.M.B	CONDITIONS	

POOL CHARACTERISTICS			
WETLAND #	W061-hf-003	LENGTH & WIDTH	20x40'
TOWN	East Granby	CLOSEST WETLAND FLAG	309 326-327
AVERAGE WATER DEPTH	12-14"	COVER TYPE	PEM PSS (PFO)

SUBSTRATE TYPE:

- Peat
- Leaf Litter
- Sand
- Gravel
- Cobble
- Mud/Muck

DOMINANT VEGETATION WITHIN POOL:

Swamp white oak, Red maple, BI gum around pool

Breeding Criteria Codes

1	Breeding chorus
2	Egg masses
3	Frog tadpoles
4	Salamander larvae
5	Presence of adults

OBLIGATE SPECIES	CODE	QUANTITY
Wood frog		
Spotted salamander	2/5	3/2
Jefferson salamander		
Blue-spotted salamander		
Spadefoot toad		
Fingernail clams		
Marbled salamander		
Unidentified mole salamander		
Fairy shrimp		

FACULTATIVE SPECIES:

- Red-spotted newt adults
- Spotted turtles
- Blanding's turtles
- Painted turtles
- Snapping turtles
- Predacious diving beetles
- Dragonfly nymphs
- Fingernail Clams
- Amphibious snails
- Spring peepers
- American toads
- Fowler's Toad
- Caddis fly case/larvae
- Dragonfly nymphs
- Damselfly nymphs
- Leeches
- Pickerel Frogs

Additional Species Observed:

Spotted salamander spermatophores

Photo Documentation:

0163 egg mass 0164 facing North
0165 adult 0166 facing North

Conclusions / Comments:

Vernal pool habitat

20F2

VERNAL POOL DATA FORM
2008 FIELD SEASON

PROJECT	GSRD CT		
DATE	4/24/08	WEATHER	Sunny 70°F
OBSERVERS	TO'S / J. S.	CONDITIONS	

POOL CHARACTERISTICS			
WETLAND #	W04 HF 003	LENGTH & WIDTH	20x40
TOWN	East Granby	CLOSEST WETLAND FLAG	326-327
AVERAGE WATER DEPTH	12-14"	COVER TYPE	PEM PSS PFO

SUBSTRATE TYPE:

- Peat
- Leaf Litter
- Sand
- Gravel
- Cobble
- Mud/Muck

DOMINANT VEGETATION WITHIN POOL:

Breeding Criteria Codes

1	Breeding chorus
2	Egg masses
3	Frog tadpoles
4	Salamander larvae
5	Presence of adults

	OBLIGATE SPECIES	CODE	QUANTITY
	Wood frog	3	>1,000
	Spotted salamander	2	55-60
	Jefferson salamander		
	Blue-spotted salamander		
	Spadefoot toad		
	Fingernail clams	5	7100
	Marbled salamander	4	6
	Unidentified mole salamander		
	Fairy shrimp	5	>12

FACULTATIVE SPECIES:

- Red-spotted newt adults
- Spotted turtles
- Blanding's turtles
- Painted turtles
- Snapping turtles
- Predacious diving beetles
- Dragonfly nymphs
- Fingernail Clams
- Amphibious snails
- Spring peepers
- American toads
- Fowler's Toad
- Caddis fly case/larvae
- Dragonfly nymphs
- Damselfly nymphs
- Leeches
- Pickerel Frogs

Additional Species Observed:

Photo Documentation:

Conclusions / Comments:

**VERNAL POOL DATA FORM
2008 FIELD SEASON**

PROJECT	GSRP CT		
DATE	3/31/08	WEATHER	40°, Rain,
OBSERVERS	SOH + DMB	CONDITIONS	light breeze

POOL CHARACTERISTICS			
WETLAND #	W004 F1004 HF 004	LENGTH & WIDTH	800x 40'
TOWN	East Granby	CLOSEST WETLAND FLAG	109 to 207
AVERAGE WATER DEPTH	12"	COVER TYPE	PEM (PSS) PFO

SUBSTRATE TYPE:

- Peat
- Leaf Litter
- Sand
- Gravel
- Cobble
- Mud/Muck

DOMINANT VEGETATION WITHIN POOL:

speckled alder, tussock sedge, sphagnum

Breeding Criteria Codes

1	Breeding chorus
2	Egg masses
3	Frog tadpoles
4	Salamander larvae
5	Presence of adults

OBLIGATE SPECIES	CODE	QUANTITY
Wood frog		
Spotted salamander	2	13+
Jefferson salamander		
Blue-spotted salamander		
Spadefoot toad		
Fingernail clams		
Marbled salamander		
Unidentified mole salamander		
Fairy shrimp		

FACULTATIVE SPECIES:

- Red-spotted newt adults
- Spotted turtles
- Blanding's turtles
- Painted turtles
- Snapping turtles
- Predacious diving beetles
- Dragonfly nymphs
- Fingernail Clams
- Amphibious snails
- Spring peepers
- American toads
- Fowler's Toad
- Caddis fly case/larvae
- Dragonfly nymphs
- Damselfly nymphs
- Leeches
- Pickerel Frogs

Additional Species Observed:

Multiple sp Salamander spermatophores

Photo Documentation:

0167+0168 habitat facing west

Conclusions / Comments:

long continuous stretch of scrub/shrub vernal pool habitat

20F2

VERNAL POOL DATA FORM
2008 FIELD SEASON

PROJECT	GSRP LF		
DATE	4/24/08	WEATHER	70°F Clear
OBSERVERS	TOS / J.S.	CONDITIONS	

POOL CHARACTERISTICS			
WETLAND #	W6MF-004	LENGTH & WIDTH	800 - 40'
TOWN	East Granby	CLOSEST WETLAND FLAG	109 to 207
AVERAGE WATER DEPTH	10-12"	COVER TYPE	PEM <u>PSS</u> PFO

SUBSTRATE TYPE:

- Peat
- Leaf Litter
- Sand
- Gravel
- Cobble
- Mud/Muck

DOMINANT VEGETATION WITHIN POOL:

Breeding Criteria Codes

1	Breeding chorus
2	Egg masses
3	Frog tadpoles
4	Salamander larvae
5	Presence of adults

OBLIGATE SPECIES	CODE	QUANTITY
Wood frog		
Spotted salamander	2	300-350
Jefferson salamander	5	74
Blue-spotted salamander		
Spadefoot toad		
Fingernail clams		
Marbled salamander		
Unidentified mole salamander		
Fairy shrimp		

FACULTATIVE SPECIES:

- Red-spotted newt adults
- Spotted turtles
- Blanding's turtles
- Painted turtles
- Snapping turtles
- Predacious diving beetles
- Dragonfly nymphs
- Fingernail Clams
- Amphibious snails
- Spring peepers
- American toads
- Fowler's Toad
- Caddis fly case/larvae
- Dragonfly nymphs
- Damselfly nymphs
- Leeches
- Pickerel Frogs

Additional Species Observed:

Photo Documentation:

Conclusions / Comments:

10F2

**VERNAL POOL DATA FORM
2008 FIELD SEASON**

PROJECT	GSRP CT		
DATE	3/31/08	WEATHER	Rain, 40°,
OBSERVERS	SOH + DMB	CONDITIONS	light breeze

POOL CHARACTERISTICS			
WETLAND #	W04FH005 HF005	LENGTH & WIDTH	30' x 1000'
TOWN	East Granby	CLOSEST WETLAND FLAG	Entire Wetland
AVERAGE WATER DEPTH	10"	COVER TYPE	PEM <u>PSS</u> PFO

SUBSTRATE TYPE:

- Peat
- Leaf Litter
- Sand
- Gravel
- Cobble
- Mud/Muck

DOMINANT VEGETATION WITHIN POOL:

Spicered Alder, tussock sedges, Redosier dogwood
Sphagnum moss

Breeding Criteria Codes

1	Breeding chorus
2	Egg masses
3	Frog tadpoles
4	Salamander larvae
5	Presence of adults

	OBLIGATE SPECIES	CODE	QUANTITY
	Wood frog		
	Spotted salamander	2	5
	Jefferson salamander	5	
	Blue-spotted salamander		
	Spadefoot toad		
	Fingernail clams		
	Marbled salamander		
	Unidentified mole salamander		
	Fairy shrimp		

FACULTATIVE SPECIES:

- Red-spotted newt adults
- Spotted turtles
- Blanding's turtles
- Painted turtles
- Snapping turtles
- Predacious diving beetles
- Dragonfly nymphs
- Fingernail Clams
- Amphibious snails
- Spring peepers
- American toads
- Fowler's Toad
- Caddis fly case/larvae
- Dragonfly nymphs
- Damselfly nymphs
- Leeches
- Pickerel Frogs

Additional Species Observed:

Sp Sel Spermatothores throughout

Photo Documentation:

0169 egg masses
0170 habitat facing North

Conclusions / Comments:

- Egg masses were observed in SE corner but Spermatothores + open water were observed throughout wetland.
- Vernal pool habitat

20F2

**VERNAL POOL DATA FORM
2008 FIELD SEASON**

PROJECT	GSRP CT		
DATE	4/24/08	WEATHER	70°F clear
OBSERVERS	TOS JS	CONDITIONS	

POOL CHARACTERISTICS			
WETLAND #	W04 HF 005	LENGTH & WIDTH	30' x 1000'
TOWN	Egg Granby	CLOSEST WETLAND FLAG	
AVERAGE WATER DEPTH	10"	COVER TYPE	PEM <u>PSS</u> PFO

SUBSTRATE TYPE:

- Peat
- Leaf Litter
- Sand
- Gravel
- Cobble
- Mud/Muck

DOMINANT VEGETATION WITHIN POOL:

Breeding Criteria Codes

1	Breeding chorus
2	Egg masses
3	Frog tadpoles
4	Salamander larvae
5	Presence of adults

OBLIGATE SPECIES	CODE	QUANTITY
Wood frog		
Spotted salamander	2	250-300
Jefferson salamander	5	54
Blue-spotted salamander		
Spadefoot toad		
Fingernail clams		
Marbled salamander		
Unidentified mole salamander		
Fairy shrimp		

FACULTATIVE SPECIES:

- Red-spotted newt adults
- Spotted turtles
- Blanding's turtles
- Painted turtles
- Snapping turtles
- Predacious diving beetles
- Dragonfly nymphs
- Fingernail Clams
- Amphibious snails
- Spring peepers
- American toads
- Fowler's Toad
- Caddis fly case/larvae
- Dragonfly nymphs
- Damselfly nymphs
- Leeches
- Pickerel Frogs

Additional Species Observed:

Photo Documentation:

Conclusions / Comments:

**VERNAL POOL DATA FORM
2008 FIELD SEASON**

PROJECT	GSRP 01131-001		
DATE	4/1/08	WEATHER	SS-60, overcast,
OBSERVERS	SON + D.S.	CONDITIONS	showers

POOL CHARACTERISTICS			
WETLAND #	W-07-WF-019 VP-1	LENGTH & WIDTH	600 X 120 approx
TOWN	East Granby	CLOSEST WETLAND FLAG	326 to 301
AVERAGE WATER DEPTH	12-14"	COVER TYPE	PEM (PSS) PFO

SUBSTRATE TYPE:

- Peat
- Leaf Litter
- Sand
- Gravel
- Cobble
- Mud/Muck

DOMINANT VEGETATION WITHIN POOL:

Alder, winterberry, Red maple, cattail

Breeding Criteria Codes

1	Breeding chorus
2	Egg masses
3	Frog tadpoles
4	Salamander larvae
5	Presence of adults

OBLIGATE SPECIES	CODE	QUANTITY
Wood frog	1	NA
Spotted salamander	2	3
Jefferson salamander		
Blue-spotted salamander		
Spadefoot toad		
Fingernail clams		
Marbled salamander		
Unidentified mole salamander		
Fairy shrimp		

FACULTATIVE SPECIES:

- Red-spotted newt adults
- Spotted turtles
- Blanding's turtles
- Painted turtles
- Snapping turtles
- Predacious diving beetles
- Dragonfly nymphs
- Fingernail Clams
- Amphibious snails
- Spring peepers
- American toads
- Fowler's Toad
- Caddis fly case/larvae
- Dragonfly nymphs
- Damselfly nymphs
- Leeches
- Pickerel Frogs

Additional Species Observed:

Spotted salamander spermatophores
Grey treefrog chorus

Photo Documentation:

0173 + 174 habitat facing west

Conclusions / Comments:

Vernal pool habitat

**VERNAL POOL DATA FORM
2008 FIELD SEASON**

PROJECT	GSRP 01131-001		
DATE	4/1/08	WEATHER	55-60°, overcast,
OBSERVERS	SOH + D.S.	CONDITIONS	Showers

POOL CHARACTERISTICS			
WETLAND #	W-07-hf 019 VP-2	LENGTH & WIDTH	30x20
TOWN	East Granby	CLOSEST WETLAND FLAG	314
AVERAGE WATER DEPTH	14-16"	COVER TYPE	REM PSS PFO

SUBSTRATE TYPE:

- Peat
- Leaf Litter
- Sand
- Gravel
- Cobble
- Mud/Muck

DOMINANT VEGETATION WITHIN POOL:

Tussock sedge, alder, & maple

Breeding Criteria Codes

1	Breeding chorus
2	Egg masses
3	Frog tadpoles
4	Salamander larvae
5	Presence of adults

	OBLIGATE SPECIES	CODE	QUANTITY
	Wood frog		
X	Spotted salamander		
	Jefferson salamander		
	Blue-spotted salamander		
	Spadefoot toad		
	Fingernail clams		
	Marbled salamander		
	Unidentified mole salamander		
	Fairy shrimp		

FACULTATIVE SPECIES:

- Red-spotted newt adults
- Spotted turtles
- Blanding's turtles
- Painted turtles
- Snapping turtles
- Predacious diving beetles
- Dragonfly nymphs
- Fingernail Clams
- Amphibious snails
- Spring peepers
- American toads
- Fowler's Toad
- Caddis fly case/larvae
- Dragonfly nymphs
- Damselfly nymphs
- Leeches
- Pickerel Frogs

- X Isopods
- X Mayfly larvae

Additional Species Observed:

Clusters of spotted salamander spermatophores
-Isopods + Mayflower larvae

Photo Documentation:

171 + 172 habitat facing NE

Conclusions / Comments:

Vernal pool habitat

**VERNAL POOL DATA FORM
2008 FIELD SEASON**

PROJECT	GSRP LT		
DATE	4/1/08	WEATHER	55-60, overcast,
OBSERVERS	SOH + DS	CONDITIONS	Showers

POOL CHARACTERISTICS			
WETLAND #	W 07 HF 011	LENGTH & WIDTH	100 x 75
TOWN	East Granby	CLOSEST WETLAND FLAG	402
AVERAGE WATER DEPTH	3-4'	COVER TYPE	PEM PSS (PFO)

SUBSTRATE TYPE:

- Peat
- Leaf Litter
- Sand
- Gravel
- Cobble
- Mud/Muck

DOMINANT VEGETATION WITHIN POOL:

aquatic grasses, water starwort

Breeding Criteria Codes

1	Breeding chorus
2	Egg masses
3	Frog tadpoles
4	Salamander larvae
5	Presence of adults

	OBLIGATE SPECIES	CODE	QUANTITY
X	Wood frog	2	10+
X	Spotted salamander		
	Jefferson salamander		
	Blue-spotted salamander		
	Spadefoot toad		
	Fingernail clams		
	Marbled salamander		
	Unidentified mole salamander		
	Fairy shrimp		

FACULTATIVE SPECIES:

- Red-spotted newt adults
- Spotted turtles
- Blanding's turtles
- Painted turtles
- Snapping turtles
- Predacious diving beetles
- Dragonfly nymphs
- Fingernail Clams
- Amphibious snails
- Spring peepers
- American toads
- Fowler's Toad
- Caddis fly case/larvae
- Dragonfly nymphs
- Damselfly nymphs
- Leeches
- Pickerel Frogs
- X isopods

Additional Species Observed:

- Sp Salamander spermatophores
- Isopods

Photo Documentation:

188 + 189 facing south

Conclusions / Comments:

Man made pond

**VERNAL POOL DATA FORM
2008 FIELD SEASON**

PROJECT	GSRP CT		
DATE	4/1/08	WEATHER	55-60, overcast,
OBSERVERS	SCH + DS	CONDITIONS	Showers

POOL CHARACTERISTICS			
WETLAND #	W-07 hf 007 007	LENGTH & WIDTH	60x80
TOWN	East Granby	CLOSEST WETLAND FLAG	100
AVERAGE WATER DEPTH	12"	COVER TYPE	PEM PSS PFO

SUBSTRATE TYPE:

- Peat
- Leaf Litter
- Sand
- Gravel
- Cobble
- Mud/Muck

DOMINANT VEGETATION WITHIN POOL:

Woolgrass, aquatic grass, duckweed, winterberry, alder

Breeding Criteria Codes

1	Breeding chorus
2	Egg masses
3	Frog tadpoles
4	Salamander larvae
5	Presence of adults

	OBLIGATE SPECIES	CODE	QUANTITY
X	Wood frog	2	10+
	Spotted salamander		
	Jefferson salamander		
	Blue-spotted salamander		
	Spadefoot toad		
	Fingernail clams		
	Marbled salamander		
	Unidentified mole salamander		
	Fairy shrimp		

FACULTATIVE SPECIES:

- Red-spotted newt adults
- Spotted turtles
- Blanding's turtles
- Painted turtles
- Snapping turtles
- Predacious diving beetles
- Dragonfly nymphs
- Fingernail Clams
- Amphibious snails
- Spring peepers
- American toads
- Fowler's Toad
- Caddis fly case/larvae
- Dragonfly nymphs
- Damselfly nymphs
- Leeches
- Pickerel Frogs

Additional Species Observed:

Photo Documentation:

186 + 187. facina west-

Conclusions / Comments:

Vernal pool habitat

**VERNAL POOL DATA FORM
2008 FIELD SEASON**

PROJECT	GSRP CT		
DATE	4/1/08	WEATHER	55-60, overcast
OBSERVERS	SOH + OS	CONDITIONS	Showers

POOL CHARACTERISTICS			
WETLAND #	W-07-hf 003	LENGTH & WIDTH	30x40
TOWN	East Granby	CLOSEST WETLAND FLAG	Entire wetland
AVERAGE WATER DEPTH	18-24"	COVER TYPE	(PEM) (PSS) PFO

SUBSTRATE TYPE:

- Peat
- Leaf Litter
- Sand
- Gravel
- Cobble
- Mud/Muck

DOMINANT VEGETATION WITHIN POOL:

aquatic grasses

Breeding Criteria Codes

1	Breeding chorus
2	Egg masses
3	Frog tadpoles
4	Salamander larvae
5	Presence of adults

	OBLIGATE SPECIES	CODE	QUANTITY
<input checked="" type="checkbox"/>	Wood frog	2	2
<input checked="" type="checkbox"/>	Spotted salamander		
	Jefferson salamander		
	Blue-spotted salamander		
	Spadefoot toad		
	Fingernail clams		
	Marbled salamander		
	Unidentified mole salamander		
	Fairy shrimp		

FACULTATIVE SPECIES:

- Red-spotted newt adults
- Spotted turtles
- Blanding's turtles
- Painted turtles
- Snapping turtles
- Predacious diving beetles
- Dragonfly nymphs
- Fingernail Clams
- Amphibious snails
- Spring peepers
- American toads
- Fowler's Toad
- Caddis fly case/larvae
- Dragonfly nymphs
- Damselfly nymphs
- Leeches
- Pickerel Frogs

Additional Species Observed:

multiple areas of sp Salamander spermatophores

Photo Documentation:

184 + 185 facing south

Conclusions / Comments:

Man made farm pond

**VERNAL POOL DATA FORM
2008 FIELD SEASON**

PROJECT	GSRP LT		
DATE	4/1/08	WEATHER	60°; overcast
OBSERVERS	SOH+DS	CONDITIONS	showers

POOL CHARACTERISTICS			
WETLAND #	W-07-hf-002	LENGTH & WIDTH	100x100
TOWN	East Granby	CLOSEST WETLAND FLAG	402
AVERAGE WATER DEPTH	4'	COVER TYPE	PEM PSS PFO

open h2o

SUBSTRATE TYPE:

- Peat
- Leaf Litter
- Sand
- Gravel
- Cobble
- Mud/Muck

DOMINANT VEGETATION WITHIN POOL:

aquatic grasses

Breeding Criteria Codes

1	Breeding chorus
2	Egg masses
3	Frog tadpoles
4	Salamander larvae
5	Presence of adults

	OBLIGATE SPECIES	CODE	QUANTITY
	Wood frog		
X	Spotted salamander	2	2
	Jefferson salamander		
	Blue-spotted salamander		
	Spadefoot toad		
	Fingernail clams		
	Marbled salamander		
	Unidentified mole salamander		
	Fairy shrimp		

FACULTATIVE SPECIES:

- Red-spotted newt adults
- Spotted turtles
- Blanding's turtles
- Painted turtles
- Snapping turtles
- Predacious diving beetles
- Dragonfly nymphs
- Fingernail Clams
- Amphibious snails
- Spring peepers
- American toads
- Fowler's Toad
- Caddis fly case/larvae
- Dragonfly nymphs
- Damselfly nymphs
- Leeches
- Pickerel Frogs

X 150 pools

Additional Species Observed:

- Spotted salamander spermatophores
- Isopods

Photo Documentation:

0182-0183 view to East

Conclusions / Comments:

Farm pond, man made vernal pool habitat

**VERNAL POOL DATA FORM
2008 FIELD SEASON**

PROJECT	GSRP CT		
DATE	4/1/08	WEATHER	55-60°, overcast
OBSERVERS	SOH + DS	CONDITIONS	Showers

POOL CHARACTERISTICS			
WETLAND #	W-07-nf-001 VPZ	LENGTH & WIDTH	40x120
TOWN	East Granby	CLOSEST WETLAND FLAG	204
AVERAGE WATER DEPTH	12-14"	COVER TYPE	<u>PEM</u> <u>PSS</u> PFO

SUBSTRATE TYPE:

- Peat
- Leaf Litter
- Sand
- Gravel
- Cobble
- Mud/Muck

DOMINANT VEGETATION WITHIN POOL:

Willow, RO dogwood, alder, steeplebush

Breeding Criteria Codes

1	Breeding chorus
2	Egg masses
3	Frog tadpoles
4	Salamander larvae
5	Presence of adults

	OBLIGATE SPECIES	CODE	QUANTITY
X	Wood frog	2/5	6/2
X	Spotted salamander		
	Jefferson salamander		
	Blue-spotted salamander		
	Spadefoot toad		
	Fingernail clams		
	Marbled salamander		
	Unidentified mole salamander		
	Fairy shrimp		

FACULTATIVE SPECIES:

- Red-spotted newt adults
- Spotted turtles
- Blanding's turtles
- Painted turtles
- Snapping turtles
- Predacious diving beetles
- Dragonfly nymphs
- Fingernail Clams
- Amphibious snails
- Spring peepers
- American toads
- Fowler's Toad
- Caddis fly case/larvae
- Dragonfly nymphs
- Damselfly nymphs
- Leeches
- Pickerel Frogs

Additional Species Observed:

Spotted sal spermatophores

Photo Documentation:

0175+176 habitat facing North

Conclusions / Comments:

Vernal pool habitat created by vehicle ruts

VERNAL POOL DATA FORM
2008 FIELD SEASON

PROJECT	GSPR 01131002		
DATE	4-8-08	WEATHER	OVERCAST AM
OBSERVERS	SH/MB	CONDITIONS	CLEAR PM 45-55°

POOL CHARACTERISTICS			
WETLAND #	W01HF001VP4	LENGTH & WIDTH	500' x ?
TOWN	E. GRANBY	CLOSEST WETLAND FLAG	108
AVERAGE WATER DEPTH	18"	COVER TYPE	PEM (PSS) (PFO)

SUBSTRATE TYPE:

- Peat
- Leaf Litter
- Sand
- Gravel
- Cobble
- Mud/Muck

DOMINANT VEGETATION WITHIN POOL:

C. minimum *C. stricto*
V. corymbosum *S. cyperinus*
Z. verticillata
A. rostrum

Breeding Criteria Codes

1	Breeding chorus
2	Egg masses
3	Frog tadpoles
4	Salamander larvae
5	Presence of adults

	OBLIGATE SPECIES	CODE	QUANTITY
	Wood frog		
X	Spotted salamander	Z	8
	Jefferson salamander		
	Blue-spotted salamander		
	Spadefoot toad		
	Fingernail clams		
	Marbled salamander		
	Unidentified mole salamander		
	Fairy shrimp		

FACULTATIVE SPECIES:

- Red-spotted newt adults
- Spotted turtles
- Blanding's turtles
- Painted turtles
- Snapping turtles
- Predacious diving beetles
- Dragonfly nymphs
- Fingernail Clams
- Amphibious snails
- Spring peepers
- American toads
- Fowler's Toad
- Caddis fly case/larvae
- Dragonfly nymphs
- Damselfly nymphs
- Leeches
- Pickerel Frogs

Additional Species Observed:

NONE

Photo Documentation:

14 15 N ASPECT

Conclusions / Comments:

AMPHIBIAN BREEDING AREA
 CREATED BY PRESENCE OF
 BEAVER DAM.
 NO FISH OBSERVED.

QUESTIONABLE AREA - SEE COMMENTS

**VERNAL POOL DATA FORM
2008 FIELD SEASON**

PROJECT	GSRP 01131002		
DATE	4/8/08	WEATHER	OVERCAST AM
OBSERVERS	SH/MS	CONDITIONS	CLEAR PM 45-55°

POOL CHARACTERISTICS			
WETLAND #	W01HF001VP3	LENGTH & WIDTH	400 X ?
TOWN	E. GRANBY	CLOSEST WETLAND FLAG	209
AVERAGE WATER DEPTH	18"	COVER TYPE	PEM (PSS) (PFO)

SUBSTRATE TYPE:

- Peat
- Leaf Litter
- Sand
- Gravel
- Cobble
- Mud/Muck

DOMINANT VEGETATION WITHIN POOL:

A. rubrum *N. sylvestris*
B. papyrus *Spiraea latifolia*
V. corymbosum *C. zosterifera*
Carpinus Carolinensis

Breeding Criteria Codes

1	Breeding chorus
2	Egg masses
3	Frog tadpoles
4	Salamander larvae
5	Presence of adults

	OBLIGATE SPECIES	CODE	QUANTITY
	Wood frog		
X	Spotted salamander	2	10+
	Jefferson salamander		
	Blue-spotted salamander		
	Spadefoot toad		
	Fingernail clams		
	Marbled salamander		
	Unidentified mole salamander		
	Fairy shrimp		

FACULTATIVE SPECIES:

- Red-spotted newt adults
- Spotted turtles
- Blanding's turtles
- Painted turtles
- Snapping turtles
- Predacious diving beetles
- Dragonfly nymphs
- Fingernail Clams
- Amphibious snails
- Spring peepers
- American toads
- Fowler's Toad
- Caddis fly case/larvae
- Dragonfly nymphs
- Damselfly nymphs
- Leeches
- Pickerel Frogs

Additional Species Observed:

BEAVER ACTIVITY - CONSTRUCTED DAM
 UNID'S BEETLE
 MINNOWS

Photo Documentation:

12/13 SW ASPECT

Conclusions / Comments:

AMPHIB BREEDING AREA
 HOWEVER, PRESENCE OF FISH RAISES
 QUESTION OF WHETHER AMPHIB'S CAN
 SURVIVE.

**VERNAL POOL DATA FORM
2008 FIELD SEASON**

PROJECT	GSRP 01131002		
DATE	4-7-08	WEATHER	OVERCAST AM 45-55°
OBSERVERS	SH/MB	CONDITIONS	CLEAR PM

POOL CHARACTERISTICS			
WETLAND #	WD1HFOO1VP2	LENGTH & WIDTH	80 x 60'
TOWN	E. GRANBY	CLOSEST WETLAND FLAG	201
AVERAGE WATER DEPTH	8"	COVER TYPE	PEM PSS PFO

SUBSTRATE TYPE:

- Peat
- Leaf Litter
- Sand
- Gravel
- Cobble
- Mud/Muck

DOMINANT VEGETATION WITHIN POOL:

A. rubrum
Q. velutina
V. cosymbosum
C. stricta

Breeding Criteria Codes

1	Breeding chorus
2	Egg masses
3	Frog tadpoles
4	Salamander larvae
5	Presence of adults

	OBLIGATE SPECIES	CODE	QUANTITY
X	Wood frog	1;2	20+
X	Spotted salamander	2	2
	Jefferson salamander		
	Blue-spotted salamander		
	Spadefoot toad		
	Fingernail clams		
	Marbled salamander		
	Unidentified mole salamander		
	Fairy shrimp		

FACULTATIVE SPECIES:

- Red-spotted newt adults
- Spotted turtles
- Blanding's turtles
- Painted turtles
- Snapping turtles
- Predacious diving beetles
- Dragonfly nymphs
- Fingernail Clams
- Amphibious snails
- Spring peepers
- American toads
- Fowler's Toad
- Caddis fly case/larvae
- Dragonfly nymphs
- Damselfly nymphs
- Leeches
- Pickerel Frogs

Additional Species Observed:

SPERMATOPHYTES - SPOTTED SAL'
WATER STRIDER
UNID'D LARVA

Photo Documentation:

8;9 NW ASPECT

Conclusions / Comments:

VP HABITAT
PORTION OFF ROW CORRIDOR

**VERNAL POOL DATA FORM
2008 FIELD SEASON**

PROJECT	GSRP 0113100Z		
DATE	4-7-08	WEATHER	OVERCAST AM
OBSERVERS	SH/MB	CONDITIONS	CLEAR PM 45-55°

POOL CHARACTERISTICS			
WETLAND #	W011HF001NPI	LENGTH & WIDTH	20' x 15'
TOWN	E. GRANBY	CLOSEST WETLAND FLAG	206
AVERAGE WATER DEPTH	3-4"	COVER TYPE	PEM <u>PSS</u> PFO

SUBSTRATE TYPE:

- Peat
- Leaf Litter
- Sand
- Gravel
- Cobble
- Mud/Muck

DOMINANT VEGETATION WITHIN POOL:

J. verticillata
Sphagnum MOSS
V. corymbosum
A. robustum

Breeding Criteria Codes

1	Breeding chorus
2	Egg masses
3	Frog tadpoles
4	Salamander larvae
5	Presence of adults

	OBLIGATE SPECIES	CODE	QUANTITY
	Wood frog		
X	Spotted salamander	2	3
	Jefferson salamander		
	Blue-spotted salamander		
	Spadefoot toad		
	Fingernail clams		
	Marbled salamander		
	Unidentified mole salamander		
	Fairy shrimp		

FACULTATIVE SPECIES:

- Red-spotted newt adults
- Spotted turtles
- Blanding's turtles
- Painted turtles
- Snapping turtles
- Predacious diving beetles
- Dragonfly nymphs
- Fingernail Clams
- Amphibious snails
- Spring peepers
- American toads
- Fowler's Toad
- Caddis fly case/larvae
- Dragonfly nymphs
- Damselfly nymphs
- Leeches
- Pickerel Frogs

Additional Species Observed:

NO WATER STRIDER

Photo Documentation:

10/11 NW ASPECT

Conclusions / Comments:

AMPHIBIAN BREEDING HABITAT
HOWEVER, BASED UPON MINIMAL
WATER DEPTH, THIS AREA SHOULD BE
RECHECKED TO DETERMINE IF CONTAINS
SUFFICIENT DURATION OF INUNDATION TO
SUPPORT BREEDING

**VERNAL POOL DATA FORM
2008 FIELD SEASON**

PROJECT	GSRP 01131002		
DATE	4-7-08	WEATHER	OVERCAST AM 50°+
OBSERVERS	MB/SH	CONDITIONS	CLEAR PM

POOL CHARACTERISTICS			
WETLAND #	WOLF CREEK	LENGTH & WIDTH	400' x 120'
TOWN	E. GRANBY	CLOSEST WETLAND FLAG	303
AVERAGE WATER DEPTH	2.5'	COVER TYPE	PEM <u>PSS</u> PFO

SUBSTRATE TYPE:

- Peat
- Leaf Litter
- Sand
- Gravel
- Cobble
- Mud/Muck

DOMINANT VEGETATION WITHIN POOL:

C. occidentalis
A. rostratum
I. verticillata

Breeding Criteria Codes

1	Breeding chorus
2	Egg masses
3	Frog tadpoles
4	Salamander larvae
5	Presence of adults

	OBLIGATE SPECIES	CODE	QUANTITY
	Wood frog		
X	Spotted salamander	2	100+
	Jefferson salamander		
	Blue-spotted salamander		
	Spadefoot toad		
	Fingernail clams		
	Marbled salamander		
	Unidentified mole salamander		
X	Fairy shrimp	5	MULT

FACULTATIVE SPECIES:

- Red-spotted newt adults
- Spotted turtles
- Blanding's turtles
- Painted turtles
- Snapping turtles
- Predacious diving beetles
- Dragonfly nymphs
- Fingernail Clams
- Amphibious snails
- Spring peepers
- American toads
- Fowler's Toad
- Caddis fly case/larvae
- Dragonfly nymphs
- Damselfly nymphs
- Leeches
- Pickerel Frogs

Additional Species Observed:

SPERMATOPHYTES ABUNDANT

Photo Documentation:

6:7 EAST ASPECT

Conclusions / Comments:

VP HABITAT

**VERNAL POOL DATA FORM
2008 FIELD SEASON**

PROJECT	GSRP 01131002		
DATE	4-7-08	WEATHER	OVERCAST AM
OBSERVERS	SH / MB	CONDITIONS	CLEAR PM 45-50°

POOL CHARACTERISTICS			
WETLAND #	W01HFO10	LENGTH & WIDTH	100' x 80'
TOWN	WEST GRANBY	CLOSEST WETLAND FLAG	303
AVERAGE WATER DEPTH	10-12"	COVER TYPE	PEM PSS PFO

SUBSTRATE TYPE:

- Peat
- Leaf Litter
- Sand
- Gravel
- Cobble
- Mud/Muck

DOMINANT VEGETATION WITHIN POOL:

C. stricta
J. effusus
C. maximum
S. perennans

Breeding Criteria Codes

1	Breeding chorus
2	Egg masses
3	Frog tadpoles
4	Salamander larvae
5	Presence of adults

	OBLIGATE SPECIES	CODE	QUANTITY
X	Wood frog	2	20+
	Spotted salamander		
	Jefferson salamander		
	Blue-spotted salamander		
	Spadefoot toad		
	Fingernail clams		
	Marbled salamander		
	Unidentified mole salamander		
	Fairy shrimp		

FACULTATIVE SPECIES:

- Red-spotted newt adults
- Spotted turtles
- Blanding's turtles
- Painted turtles
- Snapping turtles
- Predacious diving beetles
- Dragonfly nymphs
- Fingernail Clams
- Amphibious snails
- Spring peepers (CHORUS)
- American toads
- Fowler's Toad
- Caddis fly case/larvae
- Dragonfly nymphs
- Damselfly nymphs
- Leeches
- Pickerel Frogs

Additional Species Observed:

BACKSWIMMERS
H. versicolor CHORUS

Photo Documentation:

4:5 HABITAT
FACING NE

Conclusions / Comments:

VERNAL POOL HABITAT

10/2

VERNAL POOL DATA FORM
2008 FIELD SEASON

PROJECT	GSRP 01131-002		
DATE	4-8-08	WEATHER	55-65°, PARTLY CLOUDY
OBSERVERS	SOH/MB	CONDITIONS	

POOL CHARACTERISTICS			
WETLAND #	W01HFOZ0VPI	LENGTH & WIDTH	40x8
TOWN	SUFFIELD	CLOSEST WETLAND FLAG	Z06
AVERAGE WATER DEPTH	10"	COVER TYPE	PEM (PSS) (PFO)

SUBSTRATE TYPE:

- Peat
- Leaf Litter
- Sand
- Gravel
- Cobble
- Mud/Muck

DOMINANT VEGETATION WITHIN POOL:

Alnus
I. verticillata
S. hypericus
Valeriana americana
Lemna sp.

Breeding Criteria Codes

1	Breeding chorus
2	Egg masses
3	Frog tadpoles
4	Salamander larvae
5	Presence of adults

	OBLIGATE SPECIES	CODE	QUANTITY
x	Wood frog	2/5	5/1
x	Spotted salamander	2	20+
	Jefferson salamander		
	Blue-spotted salamander		
	Spadefoot toad		
	Fingernail clams		
	Marbled salamander		
	Unidentified mole salamander		
	Fairy shrimp		

FACULTATIVE SPECIES:

- Red-spotted newt adults
- Spotted turtles
- Blanding's turtles
- Painted turtles
- Snapping turtles
- Predacious diving beetles
- Dragonfly nymphs
- Fingernail Clams
- Amphibious snails
- Spring peepers
- American toads
- Fowler's Toad
- Caddis fly case/larvae
- Dragonfly nymphs
- Damselfly nymphs
- Leeches
- Pickerel Frogs

Additional Species Observed:

MOSQUITO LARVAE
MAYFLY LARVAE

Photo Documentation:

24 & 25 SE ASPECT

Conclusions / Comments:

VERNAL POOL HABITAT
"U" SHAPED

VERNAL POOL DATA FORM
2008 FIELD SEASON

PROJECT	GSRP 01131-002		
DATE	4-8-08	WEATHER	PARTLY CLOUDY
OBSERVERS	SOH / MB	CONDITIONS	55-65°

POOL CHARACTERISTICS			
WETLAND #	W014FOZ0VP2	LENGTH & WIDTH	100 x 10
TOWN	SUFFERFIELD	CLOSEST WETLAND FLAG	107
AVERAGE WATER DEPTH	10"	COVER TYPE	PEM PSS PFO

SUBSTRATE TYPE:

- Peat
- Leaf Litter
- Sand
- Gravel
- Cobble
- Mud/Muck

DOMINANT VEGETATION WITHIN POOL:

Alnus rugosa
 C. zosterifolium
 C. stricta
 Lemna sp.
 Vallesneria spiralis

Breeding Criteria Codes

1	Breeding chorus
2	Egg masses
3	Frog tadpoles
4	Salamander larvae
5	Presence of adults

	OBLIGATE SPECIES	CODE	QUANTITY
	Wood frog		
X	Spotted salamander	2	20+
	Jefferson salamander		
	Blue-spotted salamander		
	Spadefoot toad		
	Fingernail clams		
	Marbled salamander		
	Unidentified mole salamander		
	Fairy shrimp		

FACULTATIVE SPECIES:

- Red-spotted newt adults
- Spotted turtles
- Blanding's turtles
- Painted turtles
- Snapping turtles
- Predacious diving beetles
- Dragonfly nymphs
- Fingernail Clams
- Amphibious snails
- Spring peepers (CHORUS)
- American toads
- Fowler's Toad
- Caddis fly case/larvae
- Dragonfly nymphs
- Damselfly nymphs
- Leeches
- Pickerel Frogs

Additional Species Observed:

Photo Documentation:

26 & 27 NE ASPECT

Conclusions / Comments:

VERNAL POOL HABITAT

**VERNAL POOL DATA FORM
2008 FIELD SEASON**

PROJECT	GSRP 01131-002		
DATE	4/8/08	WEATHER	55-65°; partly cloudy
OBSERVERS	S.O.H + M.B	CONDITIONS	

POOL CHARACTERISTICS			
WETLAND #	W01NF021	LENGTH & WIDTH	400x200
TOWN	Suffield	CLOSEST WETLAND FLAG	104
AVERAGE WATER DEPTH	10"	COVER TYPE	<input checked="" type="checkbox"/> PEM <input checked="" type="checkbox"/> PSS <input type="checkbox"/> PFO

SUBSTRATE TYPE:

- Peat
- Leaf Litter
- Sand
- Gravel
- Cobble
- Mud/Muck

DOMINANT VEGETATION WITHIN POOL:

PSS - Red osier dogwood, winterberry
 PEM - NL cattail, skunk cabbage, tussock sedge, sensitive fern

Breeding Criteria Codes

1	Breeding chorus
2	Egg masses
3	Frog tadpoles
4	Salamander larvae
5	Presence of adults

	OBLIGATE SPECIES	CODE	QUANTITY
<input checked="" type="checkbox"/>	Wood frog	2	30+
	Spotted salamander		
	Jefferson salamander		
	Blue-spotted salamander		
	Spadefoot toad		
	Fingernail clams		
	Marbled salamander		
	Unidentified mole salamander		
	Fairy shrimp		

FACULTATIVE SPECIES:

- Red-spotted newt adults
- Spotted turtles
- Blanding's turtles
- Painted turtles
- Snapping turtles
- Predacious diving beetles
- Dragonfly nymphs
- Fingernail Clams
- Amphibious snails
- Spring peepers (chorus)
- American toads
- Fowler's Toad
- Caddis fly case/larvae
- Dragonfly nymphs
- Damselfly nymphs
- Leeches
- Pickerel Frogs

Additional Species Observed:

None

Photo Documentation:

22 + 23 Habitat facing NE

Conclusions / Comments:

Amphibian Breeding area

**VERNAL POOL DATA FORM
2008 FIELD SEASON**

PROJECT	GSRP 01131-002		
DATE	4-8-08	WEATHER	PARTLY CLOUDY
OBSERVERS	SOH/MB	CONDITIONS	55-65°

POOL CHARACTERISTICS			
WETLAND #	W01HFOZZ V P1	LENGTH & WIDTH	1500 x 400
TOWN	SUFFIELD	CLOSEST WETLAND FLAG	Z05
AVERAGE WATER DEPTH	12"	COVER TYPE	<u>PEM</u> <u>PSS</u> <u>PFO</u>

SUBSTRATE TYPE:

- Peat
- Leaf Litter
- Sand
- Gravel
- Cobble
- Mud/Muck

DOMINANT VEGETATION WITHIN POOL:

- A. rubrum
- V. corymbosum
- C. stricta
- C. binnunum

Breeding Criteria Codes

1	Breeding chorus
2	Egg masses
3	Frog tadpoles
4	Salamander larvae
5	Presence of adults

	OBLIGATE SPECIES	CODE	QUANTITY
	Wood frog		
X	Spotted salamander	Z	4
	Jefferson salamander		
	Blue-spotted salamander		
	Spadefoot toad		
	Fingernail clams		
	Marbled salamander		
	Unidentified mole salamander		
	Fairy shrimp		

FACULTATIVE SPECIES:

- Red-spotted newt adults
- Spotted turtles
- Blanding's turtles
- Painted turtles
- Snapping turtles
- Predacious diving beetles
- Dragonfly nymphs
- Fingernail Clams
- Amphibious snails
- Spring peepers (CHORUS)
- American toads
- Fowler's Toad
- Caddis fly case/larvae
- Dragonfly nymphs
- Damselfly nymphs
- Leeches
- Pickerel Frogs

Additional Species Observed:

WATER SPIDER

Photo Documentation:

28 ; 29 N ASPECT - PFO
30 ; 31 N ASPECT - PEM

Conclusions / Comments:

AMPHIBIAN BREEDING AREA
PERMANENT WLET / OUTLET - FLOW
LOW EGG-MASS DENSITY
RELATIVE TO OVERALL SIZE

VERNAL POOL DATA FORM
2008 FIELD SEASON

PROJECT	GSRP 01131-002		
DATE	4-8-08	WEATHER	PARTLY CLOUDY
OBSERVERS	SOH/MB	CONDITIONS	55-65°

POOL CHARACTERISTICS			
WETLAND #	NOIHF 002 VPZ	LENGTH & WIDTH	30 X 20
TOWN	SUFFIELD	CLOSEST WETLAND FLAG	116
AVERAGE WATER DEPTH	6"	COVER TYPE	PEM PSS (PFO)

SUBSTRATE TYPE:

- Peat
- Leaf Litter
- Sand
- Gravel
- Cobble
- Mud/Muck

DOMINANT VEGETATION WITHIN POOL:

A. rubrum
Q. ilicifolia
V. corymbosum
C. stricta

Breeding Criteria Codes

1	Breeding chorus
2	Egg masses
3	Frog tadpoles
4	Salamander larvae
5	Presence of adults

	OBLIGATE SPECIES	CODE	QUANTITY
X	Wood frog	2	1
	Spotted salamander		
	Jefferson salamander		
	Blue-spotted salamander		
	Spadefoot toad		
	Fingernail clams		
	Marbled salamander		
	Unidentified mole salamander		
	Fairy shrimp		

FACULTATIVE SPECIES:

- Red-spotted newt adults
- Spotted turtles
- Blanding's turtles
- Painted turtles
- Snapping turtles
- Predacious diving beetles
- Dragonfly nymphs
- Fingernail Clams
- Amphibious snails
- Spring peepers (CHORUS)
- American toads
- Fowler's Toad
- Caddis fly case/larvae
- Dragonfly nymphs
- Damselfly nymphs
- Leeches
- Pickerel Frogs

Additional Species Observed:

Photo Documentation:

32 ; 33 N ASPECT

Conclusions / Comments:

VP HABITAT, BUT MAY NOT HOLD WATER FOR SUFFICIENT DURATION TO SUPPORT SUCCESSFUL BREEDING.

**VERNAL POOL DATA FORM
2008 FIELD SEASON**

PROJECT	GSRP 01131-002		
DATE	4-8-08	WEATHER	PARTLY CLOUDY
OBSERVERS	SDH/MB	CONDITIONS	55-65°

POOL CHARACTERISTICS			
WETLAND #	W014FO24	LENGTH & WIDTH	80x40
TOWN	SUFFIELD	CLOSEST WETLAND FLAG	204
AVERAGE WATER DEPTH	8"	COVER TYPE	PEM PSS PFO

SUBSTRATE TYPE:

- Peat
- Leaf Litter / GRASS
- Sand
- Gravel
- Cobble
- Mud/Muck

DOMINANT VEGETATION WITHIN POOL:

REED CANARY GRASS (Phalaris)
J. effusus

Breeding Criteria Codes

1	Breeding chorus
2	Egg masses
3	Frog tadpoles
4	Salamander larvae
5	Presence of adults

	OBLIGATE SPECIES	CODE	QUANTITY
X	Wood frog	Z	4
X	Spotted salamander	Z	2
	Jefferson salamander		
	Blue-spotted salamander		
	Spadefoot toad		
	Fingernail clams		
	Marbled salamander		
	Unidentified mole salamander		
	Fairy shrimp		

FACULTATIVE SPECIES:

- Red-spotted newt adults
- Spotted turtles
- Blanding's turtles
- Painted turtles
- Snapping turtles
- Predacious diving beetles
- Dragonfly nymphs
- Fingernail Clams
- Amphibious snails
- Spring peepers
- American toads
- Fowler's Toad
- Caddis fly case/larvae
- Dragonfly nymphs
- Damselfly nymphs
- Leeches
- Pickerel Frogs

Additional Species Observed:

SPOTTED SAL' SPERMATOPHYTES,
WATER SPIDER,
180POD, MOSQUITO LARVAE

Photo Documentation:

35 N ASPECT

Conclusions / Comments:

VERNAL POOL HABITAT
MOUND DEPRESSION w/ IN ROW

**VERNAL POOL DATA FORM
2008 FIELD SEASON**

PROJECT	GSRP 01131-002		
DATE	4-8-08	WEATHER	PARTLY CLOUDY
OBSERVERS	SOH/MB	CONDITIONS	55-65°

POOL CHARACTERISTICS			
WETLAND #	NO1HFOZ5	LENGTH & WIDTH	20' X 10'
TOWN	SUFFIELD	CLOSEST WETLAND FLAG	114
AVERAGE WATER DEPTH	6-8"	COVER TYPE	PEM PSS PFO

SUBSTRATE TYPE:

- Peat
- Leaf Litter
- Sand
- Gravel
- Cobble
- Mud/Muck

DOMINANT VEGETATION WITHIN POOL:

T. angustifolia
Sporogonium sp.
J. effosus
 AQUATIC GRASS (UNID'D)

Breeding Criteria Codes

1	Breeding chorus
2	Egg masses
3	Frog tadpoles
4	Salamander larvae
5	Presence of adults

	OBLIGATE SPECIES	CODE	QUANTITY
X	Wood frog	Z	1
X	Spotted salamander	Z	1
	Jefferson salamander		
	Blue-spotted salamander		
	Spadefoot toad		
	Fingernail clams		
	Marbled salamander		
	Unidentified mole salamander		
	Fairy shrimp		

FACULTATIVE SPECIES:

- Red-spotted newt adults
- Spotted turtles
- Blanding's turtles
- Painted turtles
- Snapping turtles
- Predacious diving beetles
- Dragonfly nymphs
- Fingernail Clams
- Amphibious snails
- Spring peepers (CHORUS)
- American toads
- Fowler's Toad
- Caddis fly case/larvae
- Dragonfly nymphs
- Damselfly nymphs
- Leeches
- Pickerel Frogs

Additional Species Observed:

ISOPODS

Photo Documentation:

34. E ASPECT

Conclusions / Comments:

VERNAL POOL HABITAT

VERNAL POOL DATA FORM
2008 FIELD SEASON

PROJECT	Greater Springfield Reliability Project		
DATE	04/07/08	WEATHER	~ 50 degrees, blue sky
OBSERVERS	T. Ramborger	CONDITIONS	12:30 PM

POOL CHARACTERISTICS			
WETLAND #	W04HD035	LENGTH & WIDTH	~1000' x 50'
TOWN	Enfield, CT & Agawam, MA	CLOSEST WETLAND FLAG	#103
AVERAGE WATER DEPTH		COVER TYPE	PEM PSS PFO

SUBSTRATE TYPE:

- Peat
- Leaf Litter
- Sand
- Gravel
- Cobble
- Mud/Muck

DOMINANT VEGETATION WITHIN POOL:

Cornus amomum, Onoclea sensibilis,
 Lythrum salicaria, Prunus serotina
 Algal mats

Breeding Criteria Codes

1	Breeding chorus
2	Egg masses
3	Frog tadpoles
4	Salamander larvae
5	Presence of adults

	OBLIGATE SPECIES	CODE	QUANTITY
	Wood frog	5	24+
	Spotted salamander		
	Jefferson salamander		
	Blue-spotted salamander		
	Spadefoot toad		
	Fingernail clams		
	Marbled salamander		
	Unidentified mole salamander		
	Fairy shrimp		

FACULTATIVE SPECIES:

- Red-spotted newt adults
- Spotted turtles - 2
- Blanding's turtles
- Painted turtles
- Snapping turtles
- Predacious diving beetles
- Dragonfly nymphs
- Fingernail Clams
- Amphibious snails
- Spring peepers
- American toads
- Fowler's Toad
- Caddis fly case/larvae
- Dragonfly nymphs
- Damselfly nymphs
- Leeches
- Pickerel Frogs

Additional Species Observed:

Evidence of Beaver in area

Photo Documentation: See attached photos

Conclusions / Comments:

Wetland contained in CT & MA

VERNAL POOL DATA FORM
2008 FIELD SEASON

PROJECT	Greater Springfield Reliability Project		
DATE	04/08/08	WEATHER	~50 degrees, sunny
OBSERVERS	T. Ramborger	CONDITIONS	2:15 PM

POOL CHARACTERISTICS			
WETLAND #	W04HD055	LENGTH & WIDTH	~300' x 30'
TOWN	Enfield, CT	CLOSEST WETLAND FLAG	#304
AVERAGE WATER DEPTH	2-3'	COVER TYPE	PEM PSS PFO

SUBSTRATE TYPE:

- Peat
- Leaf Litter
- Sand
- Gravel
- Cobble
- Mud/Muck

DOMINANT VEGETATION WITHIN POOL:

Lyonia ligustrina & Rhododendron sp.

Breeding Criteria Codes

1	Breeding chorus
2	Egg masses
3	Frog tadpoles
4	Salamander larvae
5	Presence of adults

	OBLIGATE SPECIES	CODE	QUANTITY
	Wood frog	2	14
	Spotted salamander	2	2
	Jefferson salamander		
	Blue-spotted salamander		
	Spadefoot toad		
	Fingernail clams		
	Marbled salamander		
	Unidentified mole salamander		
	Fairy shrimp		

FACULTATIVE SPECIES:

- Red-spotted newt adults
- Spotted turtles
- Blanding's turtles
- Painted turtles
- Snapping turtles
- Predacious diving beetles
- Dragonfly nymphs
- Fingernail Clams
- Amphibious snails
- Spring peepers
- American toads
- Fowler's Toad
- Caddis fly case/larvae
- Dragonfly nymphs
- Damselfly nymphs
- Leeches
- Pickerel Frogs

Additional Species Observed:

None

Photo Documentation: See attached photos

Conclusions / Comments:

1062

VERNAL POOL DATA FORM
2008 FIELD SEASON

PROJECT	GSRP – Manchester Substation to Meekville Junction		
DATE	04/16/08	WEATHER	~ 60 degrees, sunny
OBSERVERS	TDR/JG	CONDITIONS	2:45 PM

POOL CHARACTERISTICS			
WETLAND #	W01HF003	LENGTH & WIDTH	~200' X 50'
TOWN	Manchester, CT	CLOSEST WETLAND FLAG	#168
AVERAGE WATER DEPTH	2-3'	COVER TYPE	PEM PSS PFO

SUBSTRATE TYPE:

- Peat
- Leaf Litter
- Sand
- Gravel
- Cobble
- Mud/Muck

DOMINANT VEGETATION WITHIN POOL:

Scirpis cyperinus

Breeding Criteria Codes

1	Breeding chorus
2	Egg masses
3	Frog tadpoles
4	Salamander larvae
5	Presence of adults

	OBLIGATE SPECIES	CODE	QUANTITY
	Wood frog	2/3	20+
	Spotted salamander	2	5
	Jefferson salamander		
	Blue-spotted salamander		
	Spadefoot toad		
	Fingernail clams		
	Marbled salamander		
	Unidentified mole salamander		
	Fairy shrimp		

FACULTATIVE SPECIES:

- Red-spotted newt adults
- Spotted turtles
- Blanding's turtles
- Painted turtles
- Snapping turtles
- Predacious diving beetles
- Dragonfly nymphs
- Fingernail Clams
- Amphibious snails
- Spring peepers
- American toads
- Fowler's Toad
- Caddis fly case/larvae
- Dragonfly nymphs
- Damselfly nymphs
- Leeches
- Pickerel Frogs

Additional Species Observed:

Green Frog

Photo Documentation: See attached photo

Conclusions / Comments:

This area connected to adjacent pool via a culvert under a woods road.

**VERNAL POOL DATA FORM
2008 FIELD SEASON**

PROJECT	GSRP – Manchester Substation to Meekville Junction		
DATE	04/16/08	WEATHER	~60 degrees, sunny
OBSERVERS	TDR/JG	CONDITIONS	2:45 PM

POOL CHARACTERISTICS			
WETLAND #	W01HF003	LENGTH & WIDTH	~50' X 50'
TOWN	Manchester, CT	CLOSEST WETLAND FLAG	#166
AVERAGE WATER DEPTH	1 – 2'	COVER TYPE	PEM PSS PFO

SUBSTRATE TYPE:

- Peat
- Leaf Litter
- Sand
- Gravel
- Cobble
- Mud/Muck

DOMINANT VEGETATION WITHIN POOL:

Alnus rugosa, Cornus amomum

Breeding Criteria Codes

1	Breeding chorus
2	Egg masses
3	Frog tadpoles
4	Salamander larvae
5	Presence of adults

	OBLIGATE SPECIES	CODE	QUANTITY
	Wood frog		
	Spotted salamander	2	18
	Jefferson salamander		
	Blue-spotted salamander		
	Spadefoot toad		
	Fingernail clams		
	Marbled salamander		
	Unidentified mole salamander		
	Fairy shrimp		

FACULTATIVE SPECIES:

- Red-spotted newt adults
- Spotted turtles
- Blanding's turtles
- Painted turtles
- Snapping turtles
- Predacious diving beetles
- Dragonfly nymphs
- Fingernail Clams
- Amphibious snails
- Spring peepers
- American toads
- Fowler's Toad
- Caddis fly case/larvae
- Dragonfly nymphs
- Damselfly nymphs
- Leeches
- Pickerel Frogs

Additional Species Observed:

None

Photo Documentation: See attached photos

Conclusions / Comments:

This area connected to adjacent pool via a culvert under a woods road.



**Connecticut
Light & Power**

The Northeast Utilities System

NEW ENGLAND
EAST  **WEST
SOLUTION**

EX. 3: “Environmental Sound Assessment Study – North Bloomfield Substation” by Burns & McDonnell Engineering Company, Inc.

ENVIRONMENTAL SOUND ASSESSMENT STUDY

NORTH BLOOMFIELD SUBSTATION

THE GREATER SPRINGFIELD RELIABILITY PROJECT

BY

THE CONNECTICUT LIGHT AND POWER COMPANY

JANUARY 2008



**Connecticut
Light & Power**

The Northeast Utilities System

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1.0 Introduction

Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) has been contracted by Northeast Utilities System (NUS) to conduct an environmental sound assessment study for the proposed modification at their existing North Bloomfield substation in Connecticut. NUS is proposing to install a new transformer, breakers, and a control house (Project) at their existing North Bloomfield substation, as part of the Greater Springfield Reliability Project.

The objectives of this study are to identify local noise ordinances, measure ambient noise levels at the existing substation, estimate operational noise levels from the proposed modifications, and examine the potential effects of the projected noise levels on the closest sound receivers in the surrounding communities due to operation of the proposed noise sources.

2.0 Acoustical Terminology

Noise is often considered unwanted sound. However, human response to sound is complex and is influenced by a variety of acoustic and non-acoustic factors. Acoustic factors generally include the sound's amplitude, duration, frequency content, and fluctuations. Non-acoustic factors typically include the listener's ability to become accustomed to the sound, the listener's attitude towards the noise and the noise source, the listener's view of the necessity of the noise, and the predictability of the noise. As such, response to noise is highly individualized.

Amplitude and frequency physically characterize sound energy. Sound amplitude is measured in decibels (dB) as the logarithmic ratio of a sound pressure to a reference sound pressure (20 microPascals). The reference sound pressure corresponds to the typical threshold of human hearing. A three dB change in a continuous broadband noise is generally considered "just barely perceptible" to the average listener. Similarly, a six dB change is generally considered "clearly noticeable" and a 10 dB change is generally considered a doubling (or halving) of the apparent loudness.

Frequency is measured in hertz (Hz), which is the number of cycles per second. The typical human ear can hear frequencies ranging from approximately 20 to 20,000 Hz. Normally, the human ear is most sensitive to sounds in the middle frequencies (1,000 to 8,000 Hz) and is less sensitive to sounds in the low and high frequencies. As such, the A-weighting scale was developed to simulate the frequency response of the human ear to sounds at typical environmental levels. The A-weighting scale emphasizes sounds in the middle frequencies and de-emphasizes sounds in the low and high frequencies. Any sound level to which the A-weighting scale has been applied is expressed in A-weighted decibels or dBA. For

reference, the A-weighted sound pressure level and subjective loudness associated with some common noise sources are listed in Table 1.

Table 1: Typical Sound Pressure Levels Associated with Common Noise Sources

Sound Pressure Level (dBA)	Subjective Evaluation	Environment	
		Outdoor	Indoor
140	Deafening	Jet aircraft at 75 ft	
130	Threshold of pain	Jet aircraft during takeoff at a distance of 300 ft	
120	Threshold of feeling	Elevated train	Hard rock band
110		Jet flyover at 1000 ft	Inside propeller plane
100	Very loud	Power mower, motorcycle at 25 ft, auto horn at 10 ft, crowd noise at football game	
90		Propeller plane flyover at 1000 ft, noisy urban street	Full symphony or band, food blender, noisy factory
80	Moderately loud	Diesel truck (40 mph) at 50 ft	Inside auto at high speed, garbage disposal, dishwasher
70	Loud	B-757 cabin during flight	Close conversation, vacuum cleaner, electric typewriter
60	Moderate	Air-conditioner condenser at 15 ft, near highway traffic	General office
50	Quiet		Private office
40		Farm field with light breeze, birdcalls	Soft stereo music in residence
30	Very quiet	Quiet residential neighborhood	Bedroom, average residence (without t.v. and stereo)
20		Rustling leaves	Quiet theater, whisper
10	Just audible		Human breathing
0	Threshold of hearing		

Source: Adapted from Architectural Acoustics, M. David Egan, 1988 and Architectural Graphic Standards, Ramsey and Sleeper, 1994.

There are also objective factors to consider when determining the sound and how people may be affected by the sound. A noise spectrum that contains audible pure tones is typically more annoying than a spectrum with the same overall level, but without the tones. It has been shown that, when noise complaints were received when registering sound levels under 45 dBA, the noise had some tonal components.

Noise in the environment is constantly fluctuating; examples could be when a car drives by, a dog barks, or a plane passes overhead. Therefore, sound metrics have been developed to quantify fluctuating environmental sound levels. These metrics include the exceedance sound levels. The exceedance sound level, L_x , is the sound level exceeded “x” percent of the sampling period and is referred to as a statistical sound level. The most common L_x values are L_{eq} , L_{90} , L_{50} , and L_{10} . The L_{eq} is the equivalent level of a constant sound over a specific time period that has the same sound energy as the actual sound over the same period. The L_{90} is the sound level exceeded 90 percent of the sampling period. The L_{90} represents the sound level without the influence of loud, transient noise sources and is often referred to as the residual or background sound level. The L_{50} is the sound level exceeded 50 percent of the sampling period. The L_{10} represents the occasional louder sounds and is often referred to as the intrusive sound level. The variation between the L_{90} , L_{50} , and L_{10} sound levels can provide an indication of the variability of the acoustical environment. If the acoustical environment is perfectly steady, all values are identical. A large variation between the values indicates highly fluctuating sound levels. For instance, measurements near a roadway with frequent passing vehicles may cause a large variation in the statistical sound levels. For this report, L_{eq} is used.

3.0 Applicable Regulations

The State of Connecticut Noise Regulation (Section 22a-69-1 to 7.4) limits noise on the basis of both emitter and receptor land use classifications. These limits apply at or within the receptor property boundary and are presented below in Table 2.

Table 2: State of Connecticut Noise Regulation Sound Level Limits (dBA)

Emitter Class	Receptor Class			
	C	B	A/Day	A/Night
C	70	66	61	51
B	62	62	55	45
A	62	55	55	45

In the above table, “day” is defined as the time interval from 7:00 A.M. to 10:00 P.M. “Night” is defined as the time interval from 10:00 P.M. to 7:00 A.M. Noise zone classifications are based on the actual use of the land. Where multiple land uses exist on the same property, the least restrictive limits apply.

A Class A noise zone is land generally designated for residential use or areas where serenity and tranquility are essential to the intended use. A Class B noise zone includes land uses generally of a

commercial nature. A Class C noise zone includes uses generally of an industrial nature including utilities such as the substation.

The regulation also prohibits the production of prominent, audible discrete tones. If a facility produces such sounds, the applicable limits in Table 2 are reduced by five dBA to offset the undesirable nature of tonal sound in the environment. The regulation defines prominent discrete tones on the basis of one-third octave band sound levels.

For the purposes of this analysis, the North Bloomfield substation was assumed to be a Class C noise zone, while the area surrounding the substation was assumed to be a Class A, or residential, noise zone. Therefore, the applicable noise limits for the North Bloomfield substation during the day and night are 61 and 51 dBA, respectively. Further, meeting limits of 56 and 46 dBA, respectively, will offset any prominent discrete tones.

4.0 Existing Noise Measurements

On January 7, 2008, between the hours of 5:00 P.M. and 6:00 P.M., and on January 8, 2008, between the hours of 1:00 A.M. and 2:00 A.M., 5:00 A.M. and 6:00 A.M., and 10:00 A.M. and 11:00 A.M., Burns & McDonnell personnel obtained environmental sound level measurements to capture the ambient sound levels near the existing North Bloomfield substation, located in the town of Bloomfield. The land use surrounding the North Bloomfield substation consists of undeveloped upland forest and rural residential areas. St. Andrews Church and cemetery are also located in the vicinity of the substation (see Figure 1).

Weather conditions were favorable for conducting ambient sound measurements during all survey periods. On January 7, 2008, winds were calm and temperatures were approximately 39 degrees Fahrenheit with 79 percent relative humidity. On January 8, 2008, winds were calm during all three measurement periods. Temperatures were approximately 36 degrees Fahrenheit with 92 percent relative humidity during the 1:00 A.M. to 2:00 A.M. period, 37 degrees Fahrenheit with 96 percent relative humidity during the 5:00 A.M. to 6:00 A.M. period, and 44 degrees Fahrenheit with 96 percent relative humidity during the 10:00 A.M. to 11:00 A.M. measurement period.

\\Espsrv\data\DATA2\Projects\NUS\NETR_Projects\45063_Springfield_345k\Environmental\GIS\ARC\ArcMXD\Network\GreaterSpringfield\Figures\Noise_Study\GSRP_2008.01.30_CT_NorthBloomfield_Figure1.mxd (Issued: January 30, 2008)

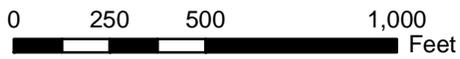
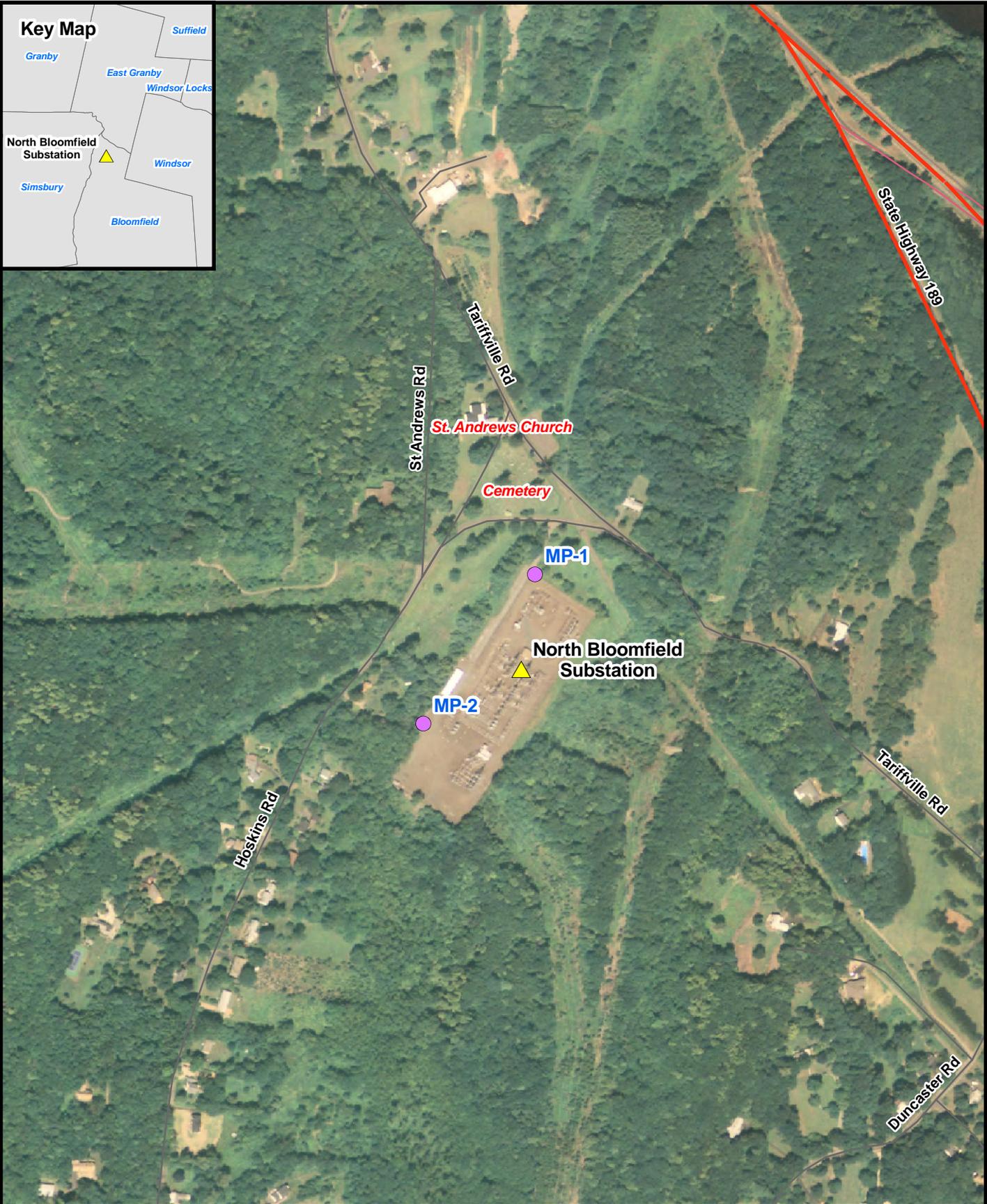


Figure 1
Greater Springfield Reliability
Project
Measurement Locations
North Bloomfield Substation

Source: USDA NAIP 2006 Aerial Photography & CT DEP.

Sound level measurements were made at two locations around the existing fenceline of the North Bloomfield substation, and in the direction of nearby residences as shown in Figure 1. These locations were selected because they were deemed to be representative of existing environmental conditions, are near sensitive noise receivers, and were accessible. Measurements were taken using two Larson-Davis Model 824 Type I sound level meters. The sound level meter was calibrated before each set of measurements. None of the calibration level changes exceeded ± 0.3 dB. A windscreen was used at all times on the meter, and the meter was mounted on a tripod, approximately five feet above ground with the microphone directed toward the substation. The meter measured overall L_{eq} sound levels along with octave band and one-third octave band frequency sound levels.

At each location, sound levels at each frequency band were measured and logged by the noise meter. Fifteen-minute measurement samples were recorded during each of the measurement periods. The sound levels varied at each measurement point depending on the proximity to the substation and the extraneous sounds that occurred during the measurement points. The measurement points were located at approximately the same elevation as the existing substation.

Extraneous noises during the measurement periods included noise associated with the substation, traffic, planes overhead, and birds. The existing North Bloomfield substation was audible during most of the measurement periods. The measured, A-weighted L_{eq} sound levels are presented in Table 3. Ambient A-weighted sound levels varied from a low of 36.4 dBA at MP2 during the night to a high of 49.6 dBA at both MP1 and MP2 during the early evening.

Table 3: Existing Ambient Noise Level Measurements (L_{eq})

Time Period	Measurement Point	Location Description	Existing Ambient Noise (dBA)
1/7/08; 5 P.M. - 6 P.M.	MP1	NW corner of substation fenceline	49.6
	MP2	SW side of substation fenceline	49.6
1/8/08; 1 A.M.- 2 A.M.	MP1	NW corner of substation fenceline	39.6
	MP2	SW side of substation fenceline	36.4
1/8/08; 5 A.M.- 6 A.M.	MP1	NW corner of substation fenceline	42.3
	MP2	SW side of substation fenceline	40.8
1/8/08; 10 A.M.- 11 A.M.	MP1	NW corner of substation fenceline	45.2
	MP2	SW side of substation fenceline	42.3

5.0 Operational Noise Levels

NUS plans to install one set of transformers at the North Bloomfield substation which will consist of one, 345-kilovolts (kV) unit. NUS also plans to install additional breakers and a control house at the existing substation. The only new noise source at the substation will be the proposed transformer as the breakers and control house are not expected to create any additional noise. In order to evaluate the sound predicted from the new transformer, the proposed noise source was modeled using industry-accepted sound modeling software which calculated the expected sound levels at the identified receivers. The program used to model the new transformer was the Computer Aided Design for Noise Abatement (CadnaA), Version 3.7, published by DataKustik, Ltd., Munich, Germany. The CadnaA program is a scaled, three-dimensional program which takes into account each piece of noise-emitting equipment on the Project site and predicts sound levels in circular contours of equal sound pressure. Appropriate sound generation sources are applied for all sound radiating surfaces and points. The model calculates sound propagation based on ISO 9613-2:1996, General Method of Calculation. ISO 9613 and CadnaA assess the sound levels based on the Octave Band Center Frequency range from 31.5 to 8,000 Hz.

The sound power levels emitted from the transformer were predicted based on vendor's data. Table 4 presents the sound power level at each of the octave bands, as well as the overall sound power levels for the transformer. Vendor data for the sound power level at the lower and higher octave bands was not available. As a conservative approach, existing buildings and structures were not included in the model.

Table 4: New Transformer Sound Power Levels at Each Octave Band Frequency

Equipment	dB at Octave Band Frequency (Hz)									Total Sound Power Level (dB)	Total Sound Power Level (dBA)
	32	63	125	250	500	1000	2000	4000	8000		
Transformer	---	76.9	85.8	79.5	70.6	62.1	---	---	---	87.3	74.6

The predicted sound levels from the CadnaA noise model at each measurement point are presented in Table 5. These sound levels are a result of the proposed noise-emitting equipment (transformers) that will be installed at the existing North Bloomfield substation as part of this Project. Existing background measurements (which include the current North Bloomfield substation operation) were logarithmically added to the expected sound levels from the proposed Project to determine total sound levels at each measurement location when the new Project is operational, and are presented in Table 5 as well.

Table 5: Predicted Sound Pressure Levels

Measurement Point	Time Period	Existing Ambient Noise Levels (dBA)	Estimated Noise Levels from Project (dBA)	Overall Projected Noise Levels (Existing Ambient with New Project Operating) (dBA)
MP1	5 P.M. – 6 P.M.	49.6	19.1	49.6
MP2	5 P.M. – 6 P.M.	49.6	39.1	50.0
MP1	1 A.M.- 2 A.M.	39.6	19.1	39.6
MP2	1 A.M.- 2 A.M.	36.4	39.1	41.0
MP1	5 A.M. – 6 A.M.	42.3	19.1	42.3
MP2	5 A.M. – 6 A.M.	40.8	39.1	43.0
MP1	10 A.M. – 11 A.M.	45.2	19.1	45.2
MP2	10 A.M. – 11 A.M.	42.3	39.1	44.0

The overall projected noise levels (existing ambient noise levels combined with the new transformer operating) were compared to the applicable Connecticut noise regulations in Table 6. The town of Bloomfield does not have noise regulations so the Connecticut noise regulations are the only applicable regulations at this location. The Connecticut noise regulations prohibit the production of prominent, audible discrete tones which are defined in the regulation based on one-third octave band sound levels. If a facility produces such sounds, the applicable overall noise limits are reduced by five dBA to offset the undesirable nature of tonal sound in the environment. The CadnaA noise model is not capable of predicting one-third octave band sound levels; therefore, as a conservative approach, the overall project noise levels were also compared to the applicable noise limits reduced by five dBA.

Table 6: Overall Projected Noise Levels and Connecticut Noise Limits for Receptor Class A

Measurement Point	Time Period	Overall Projected Noise Levels (Existing Ambient with New Project Operating) (dBA)	Connecticut Noise Limits for Receptor Class A* (dBA)	Connecticut Noise Limits for Receptor Class A minus 5 dBA (dBA)
MP1	5 P.M. – 6 P.M.	49.6	61	56
MP2	5 P.M. – 6 P.M.	50.0	61	56
MP1	1 A.M.- 2 A.M.	39.6	51	46
MP2	1 A.M.- 2 A.M.	41.0	51	46
MP1	5 A.M. – 6 A.M.	42.3	51	46
MP2	5 A.M. – 6 A.M.	43.0	51	46
MP1	10 A.M. – 11 A.M.	45.2	61	56
MP2	10 A.M. – 11 A.M.	44.0	61	56

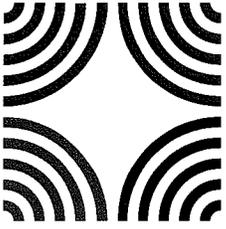
*Noise daytime limits for Receptor Class A were used for measurement periods between the hours of 7 A.M. and 10 P.M. and night-time limits were used for measurement periods between the hours of 10 P.M. and 7 A.M.

6.0 Conclusions and Recommendations

As shown by the above results, it is predicted that the overall projected noise levels at the North Bloomfield substation (after the proposed transformer is operating) will not exceed either the day- or night-time Connecticut noise limits. Also shown in Table 6, the overall projected noise levels at the North Bloomfield substation will not exceed any of the reduced noise limits; therefore, the proposed modifications at the North Bloomfield substation will be in compliance with all Connecticut noise regulations.

EX. 4: Federal, State, and Municipal Agencies Correspondence

- 1) SHPO Letter to Jeff Borne, NU dated February 8, 2006. Sub: CL&P Greater Springfield Reliability Project Bloomfield, East Granby, Suffield and Enfield, CT.
- 2) US FWS letter to Don Biondi, NU dated May 14, 2008. Re: Transmission line upgrade/expansion in Manchester, CT.
- 3) US FWS letter to Don Biondi, NU dated Nov 8, 2007. Re: Electric transmission facilities expansion 6 sites in CT, 17 sites MA.
- 4) CT DEP Bureau of Natural Resources letter to Don Biondi, NU dated March 17, 2008. Re: The Connecticut Light & Power Company Greater Springfield Reliability Project in Bloomfield, East Granby, Granby, Enfield, Somers and Suffield, Connecticut.
- 5) CT DEP letter to Don Biondi, NU dated March 10, 2008. Re: Greater Springfield Reliability Project.
- 6) CT DEP letter to Don Biondi, NU dated April 24, 2008. Re: Proposed upgrade and expansion of CL&P Manchester Substation to Meekville Junction in Manchester.
- 7) Town of Bloomfield Inland Wetlands and Watercourses Commission, NU dated August 28, 2008. Re: CL&P Location Review North Bloomfield Substation Expansion.
- 8) Town of Bloomfield Plan and Zoning Commission to Jeff Towle, NU dated September 2, 2008.
- 9) CT DEP National Diversity Database, NU dated September 15, 2008. Re: Update on the CL&P Greater Springfield Reliability Project Rare Species Surveys.



Connecticut Commission on Culture & Tourism

February 8, 2008

**Historic Preservation
and Museum Division**

One Constitution Plaza
Second Floor
Hartford, Connecticut
06103

860.256.2800
860.256.2763 (f)

Mr. Jeffrey Borne
Transmission Siting and Permitting
Northeast Utilities Service Company
PO Box 270
Hartford, CT 06141-0270

Subject: CL&P Greater Springfield Reliability Project
Bloomfield, East Granby, Suffield and Enfield, CT

Dear Mr. Borne:

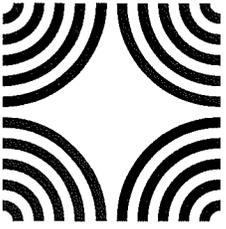
The State Historic Preservation Office has reviewed the *Historical and Archaeological Assessment of Connecticut Sections of the Connecticut Light & Power Company Greater Springfield Reliability Project, Towns of Bloomfield, East Granby, Suffield & Enfield, Connecticut* prepared by Raber Associates concerning the above-named project. In the opinion of the State Historic Preservation Office, the archival and archaeological methodologies employed by Raber Associates are consistent with our *Environmental Review Primer for Connecticut's Archaeological Resources*.

The State Historic Preservation Office understands that the location, size and nature of the actual transmission route(s) and associated new structures remain undetermined pending Connecticut Siting Council approval of a preferred route and CL&P's subsequent completion of a Development and Management Plan. As such, this office concurs with Raber Associates that further historic and archaeological investigations and/or technical evaluations appear warranted with respect to the identification, assessment and professional management of cultural resources that may be located along or within immediate proximity to transmission routes and structures associated with the Greater Springfield Reliability Project.

This office looks forward to additional coordination and consultation with the Northeast Utilities Service Company and all interested parties concerning the professional consideration of Connecticut's historic, architectural and archaeological resources within CL&P's Development and Management Plan for this complex transmission project.

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CL&P Greater Springfield Reliability Project
Bloomfield, East Granby, Suffield and Enfield, CT
Page 2

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

Sincerely,

Karen Senich
State Historic Preservation Officer

cc: Dr. Nicholas Bellantoni/OSA
Dr. Michael Raber/RA



United States Department of the Interior



FISH AND WILDLIFE SERVICE

New England Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5087

<http://www.fws.gov/northeast/newenglandfieldoffice>

May 14, 2008

Reference:	<u>Project</u>	<u>Location</u>
	Transmission line upgrade/expansion	Manchester, CT

Donald Biondi
Northeast Utilities System
107 Selden St.
Berlin, CT 06037

Dear Mr. Biondi:

This responds to your recent correspondence requesting information on the presence of federally-listed and/or proposed endangered or threatened species in relation to the proposed activity(ies) referenced above.

Based on information currently available to us, no federally-listed or proposed, threatened or endangered species or critical habitat under the jurisdiction of the U.S. Fish and Wildlife Service are known to occur in the project area(s). Preparation of a Biological Assessment or further consultation with us under Section 7 of the Endangered Species Act is not required.

This concludes our review of listed species and critical habitat in the project location(s) and environs referenced above. No further Endangered Species Act coordination of this type is necessary for a period of one year from the date of this letter, unless additional information on listed or proposed species becomes available.

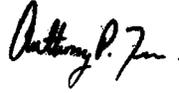
In order to curtail the need to contact this office in the future for updated lists of federally-listed or proposed threatened or endangered species and critical habitats, please visit the Endangered Species Consultation page on the New England Field Office's website:

www.fws.gov/northeast/newenglandfieldoffice/EndangeredSpec-Consultation.htm

In addition, there is a link to procedures that may allow you to conclude if habitat for a listed species is present in the project area. If no habitat exists, then no federally-listed species are present in the project area and there is no need to contact us for further consultation. If the above conclusion cannot be reached, further consultation with this office is advised. Information describing the nature and location of the proposed activity that should be provided to us for further informal consultation can be found at the above-referenced site.

Thank you for your coordination. Please contact us at 603-223-2541 if we can be of further assistance.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Anthony P. Tur". The signature is written in a cursive style with a prominent initial "A".

Anthony P. Tur
Endangered Species Specialist
New England Field Office



United States Department of the Interior



FISH AND WILDLIFE SERVICE
New England Field Office
70 Commercial Street, Suite 300
Concord, New Hampshire 03301-5087

November 8, 2007

Reference: Project Location
 Electric transmission facilities expansion 6 sites in CT, 17 sites in MA

Donald Biondi
Northeast Utilities System
107 Selden St.
Berlin, CT 06037

Dear Mr. Biondi:

This responds to your recent correspondence requesting information on the presence of federally-listed and/or proposed endangered or threatened species in relation to the proposed activity(ies) referenced above.

Based on information currently available to us, no federally-listed or proposed, threatened or endangered species or critical habitat under the jurisdiction of the U.S. Fish and Wildlife Service are known to occur in the project area(s). Preparation of a Biological Assessment or further consultation with us under Section 7 of the Endangered Species Act is not required.

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www.fws.gov/northeast/newenglandfieldoffice/EndangeredSpec-Consultation.htm

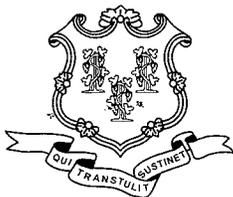
In addition, there is a link to procedures that may allow you to conclude if habitat for a listed species is present in the project area. If no habitat exists, then no federally-listed species are present in the project area and there is no need to contact us for further consultation. If the above conclusion cannot be reached, further consultation with this office is advised. Information describing the nature and location of the proposed activity that should be provided to us for further informal consultation can be found at the above-referenced site.

Thank you for your coordination. Please contact us at 603-223-2541 if we can be of further assistance.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Anthony P. Tur". The signature is written in a cursive style with a prominent initial "A".

Anthony P. Tur
Endangered Species Specialist
New England Field Office



STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION



Bureau of Natural Resources
Wildlife Division
79 Elm Street, Sixth Floor
Hartford, CT 06106
Natural Diversity Data Base

March 17, 2008

Mr. Donald D. Biondi
Northeast Utilities Service Company
P.O. Box 270
Hartford, CT 06141-0270

re: The Connecticut Light and Power
Company Greater Springfield Reliability
Project in Bloomfield, East Granby, Granby,
Enfield, Somers and Suffield, Connecticut

Dear Mr. Biondi:

I have reviewed Natural Diversity Data Base maps and files regarding the area delineated on the map you provided for the proposed Connecticut Light and Power Company Greater Springfield Reliability Project in Bloomfield, East Granby, Granby, Enfield, Somers and Suffield, Connecticut. Attached to this letter are two maps showing the locations of several state-listed plants that may be impacted by this proposed project. These plants need to be field located and flagged to avoid impacts by the proposed work. If you have any questions or need assistance, please call our program ecologist, Mr. Ken Metzler at 860-424-3585 or at kennth.metzler@po.state.ct.us. A separate letter from the Wildlife Division was sent regarding the impact of this project on any state-listed animal species that may occur in the study area.

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 DEP's Natural History Survey and cooperating units of Department of Environmental Protection's 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.

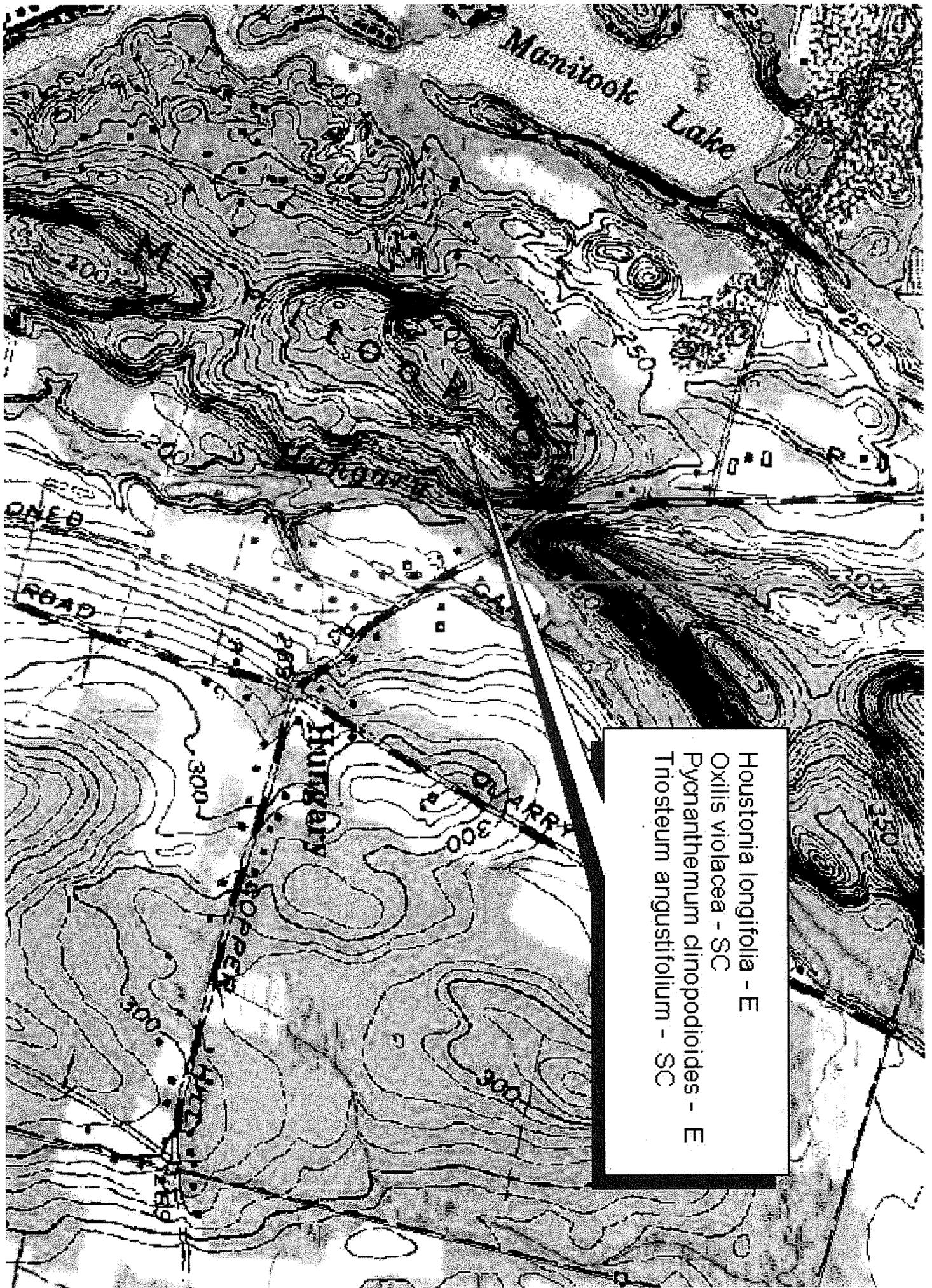
Please contact me if you have further questions at 424-3592. Thank you for consulting the Natural Diversity Data Base. Also be advised that this is a preliminary review and not a final determination. A more detailed review may be conducted as part of any subsequent environmental permit applications submitted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

Sincerely,

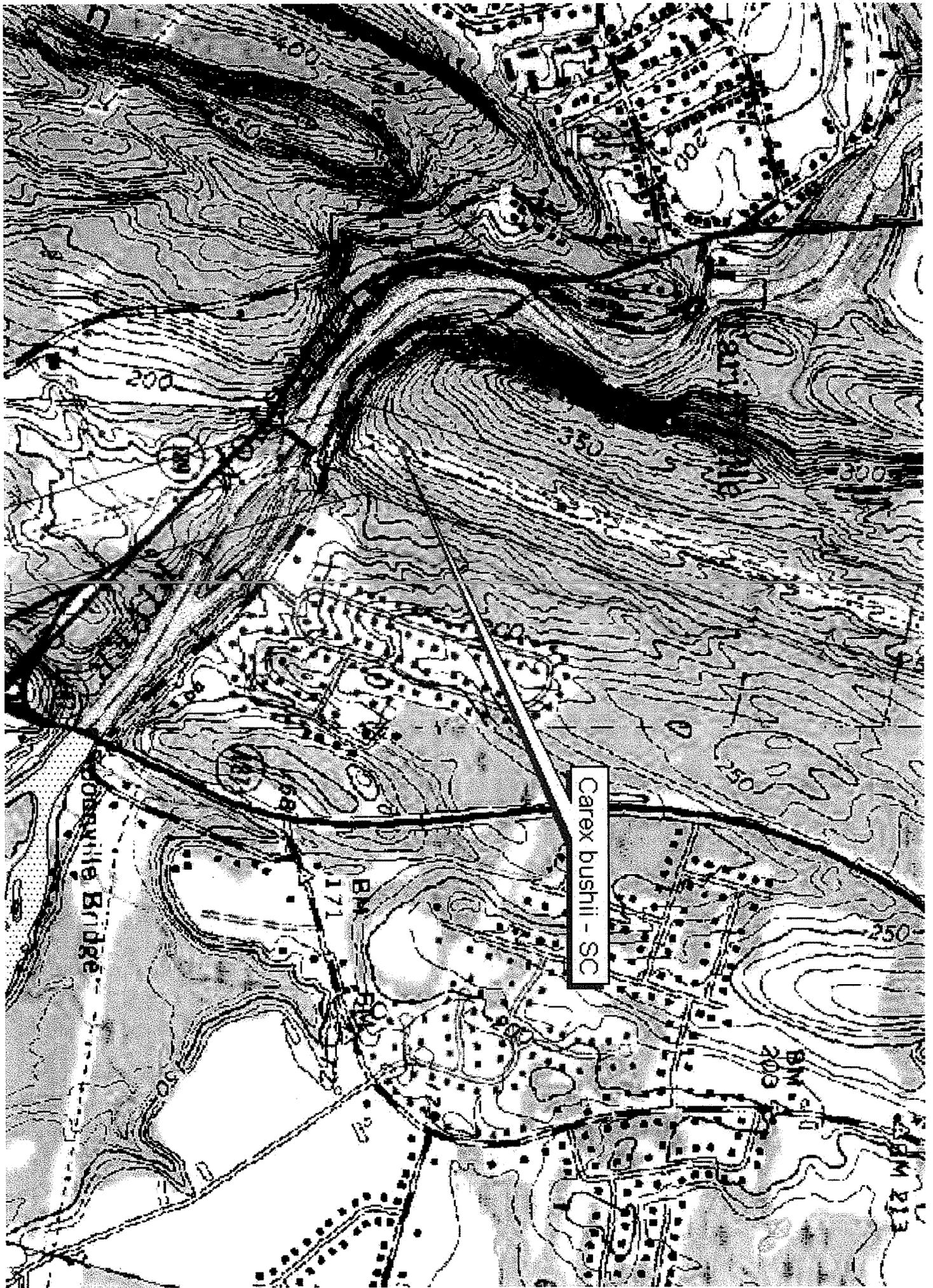
A handwritten signature in black ink, appearing to read "D.M. McKay".

Dawn M. McKay
Biologist/Environmental Analyst 3

Cc: NDDDB File # 15747



- Houstonia longifolia - E
- Oxilis violacea - SC
- Pycnanthemum clinopodioides - E
- Tristeum angustifolium - SC



Carex bushii - SC

Cossythe Bridge

BM
171

BM
209

250

300

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200

7



STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION
FRANKLIN WILDLIFE MANAGEMENT AREA



391 ROUTE 32
NORTH FRANKLIN, CT 06254
TELEPHONE: (860) 642-7239

March 10, 2008

Mr. Donald D. Biondi
Transmission siting and Permitting
Northeast Utilities
107 Selden Street
Berlin, CT 06037

re: Greater Springfield Reliability Project

Dear Mr. Biondi

Your request for information was reviewed on 1/9/08 with Dawn McKay of the Department of Environmental Protection's (DEP) Natural Diversity Data Base. Their records indicated the following:

Mapsheets 1 of 4 – Yellow hatched circles

The state species of special concern, Eastern Box turtles (*Terrapene c. carolina*) require old field and deciduous forests habitats, which can include power lines and logged woodlands. They are often found near small streams and ponds, the adults are completely terrestrial but the young may be semiaquatic, and hibernate on land by digging down in the soil from October to April. They have an extremely small home range and can usually be found in the same area year after year. We recommend that work be done in the dormant season, October through April.

Mapsheets 2 of 4 – Yellow hatched circles

The state species of special concern, Eastern Box turtles (*Terrapene c. carolina*) require old field and deciduous forests habitats, which can include power lines and logged woodlands. They are often found near small streams and ponds, the adults are completely terrestrial but the young may be semiaquatic, and hibernate on land by digging down in the soil from October to April. They have an extremely small home range and can usually be found in the same area year after year. We recommend that work be done in the dormant season, October through April.

Mapsheets 3 of 4

Yellow hatched circle to the west of Granby Jct.

The state species of special concern, Eastern Box turtles (*Terrapene c. carolina*) require old field and deciduous forests habitats, which can include power lines and logged woodlands. They are often found near small streams and ponds, the adults are completely terrestrial but the young may be semiaquatic, and hibernate on land by digging down in the soil from October to April. They have an extremely small home range and can usually be found in the same area year after year. We recommend that work be done in the dormant season, October through April.

Yellow hatched circle to the east of Granby Jct. The state species of special concern, Eastern Pearlshell mussel (*Margaritifera margaritifera*) occurs in river. If the river will actually be manipulated this project could have a serious impact on the mussels. At a minimum, the Wildlife Division recommends: That no vegetation be removed from the stream banks adjacent to the mussel habitat since land clearing activities will affect the mussels. There can be no erosion or siltation discharged into the river that can bury and kill these mussels. There can be no polluted runoff such as chemicals or fertilizer discharged into the river that can contaminate the water.

Mapsheets 4 of 4

Yellow hatched circle to the near Hatchett Hill Road

The state species of special concern Jefferson salamander (*Ambystoma jeffersonianum*) prefers steep, rocky areas with rotten logs and a heavy duff layer. They are found in or near undisturbed second growth deciduous forests and their breeding pools may be in hemlock groves or grassy pasture ponds. Jefferson salamanders are not found in nor do they tolerate radically disturbed habitats. If the route has any woods with rotten logs and duff layers, breeding pools or ponds, we recommend that work be done in the dormant season, October through February.

Yellow hatched circle to the near Hatchett Hill Road

The state species of special concern, Eastern Box turtles (*Terrapene c. carolina*) require old field and deciduous forests habitats, which can include power lines and logged woodlands. They are often found near small streams and ponds, the adults are completely terrestrial but the young may be semiaquatic, and hibernate on land by digging down in the soil from October to April. They have an extremely small home range and can usually be found in the same area year after year. We recommend that work be done in the dormant season, October through April.

Yellow hatched circles near the Spoonville Bridge

The state species of special concern, Arrow Clubtail dragonfly (*Stylurus spiniceps*) requires trees along the river, especially tree stumps above the water line to provide important emergence sites for the larvae to crawl on to and turn into adults. The adults spend the majority of their lives in the tree canopy. Activities that effect the trees or tree canopy from April to October will affect these species. The aquatic nymph stage of these species require fine sand deposits. Activities that alter the physical or chemical nature of the aquatic habitat, cause siltation or any source of pollution will be detrimental.

The state and federally endangered, dwarf wedgemussel (*Alasmidonta heterodon*) and a state species of special concern, Eastern Pond mussel (*Ligumia nasuta*) occurs in river. If the river will actually be manipulated this project could have a serious impact on the mussels. At a minimum, the Wildlife Division recommends: That no vegetation be removed from the riverbanks adjacent to the mussel habitat since land clearing activities will affect the mussels. There can be no erosion or siltation discharged into the river that can bury and kill these mussels. There can be no polluted runoff such as chemicals or fertilizer discharged into the river that can contaminate the water.

The Wildlife Division would be happy to provide additional, site-specific recommendations pursuant to any of the species issues outlined above. Thank you for the opportunity to comment.

Sincerely,



Julie Victoria, Wildlife Biologist
Franklin Swamp Wildlife Management Area
391 Route 32
N. Franklin, CT 06254
phone: 860-642-7239

cc: NDDB - 15747
J. Dickson



STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION
FRANKLIN/WILDLIFE MANAGEMENT AREA



391 ROUTE 32
NORTH FRANKLIN, CT 06254
TELEPHONE: (860) 642-7239

April 24, 2008

Mr. Donald D. Biondi
Northeast Utilities Service Company
P. O. Box 270
Hartford, Ct 06141-0270

re: proposed upgrade and expansion of CL&P Manchester Substation to Meekville Junction in Manchester

Dear Mr. Biondi:

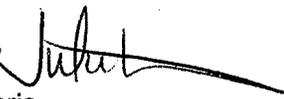
Your request was forwarded to me on 4/23/08 from Dawn McKay of the Department of Environmental Protection (DEP) Natural Diversity Data Base. Their records indicate that there are historic records of a state endangered species, the Barn Owl (*Tyto alba*) in the vicinity of this project site.

Barn owls occur in low numbers in Connecticut because their habitat which is grasslands and farmlands are declining. Their main food source, meadow voles, mice and shrews, occur in open areas such as grassy fields, old fields and wet meadows. Any activities that decrease the open areas or destroy natural nesting sites in hollow trees will eliminate barn owls from an area. However, many habitat enhancements can be made to keep or encourage barn owls to nest in the vicinity. These activities range from erecting artificial nest structures, improving natural nests or increasing natural nest site availability. Barn owls nest from March through July.

Please be advised that the Wildlife Division has not made a field inspection of the project nor have we seen detailed plans or timetables for work to be done. The past practices at a site do not preclude the existence of wildlife. If this work will be conducted in any barn owl habitat (grassy fields, old fields and wet meadows), the Wildlife Division recommends that an ornithologist familiar with the habitat requirements of this species conduct surveys. The Division recommends that surveys for barn owls be conducted during their nesting season March – July. A report summarizing the results of such surveys should include habitat descriptions, bird species list and a statement/resume giving the ornithologist' qualifications. The Wildlife Division does not maintain a list of ornithologists in the state. The results of this investigation can be forwarded to the Wildlife Division and, after evaluation, recommendations for additional surveys, if any, will be made.

Please be advised that should state permits be required or should state involvement occur in some other fashion, specific restrictions or conditions relating to the species discussed above may apply. In this situation, additional evaluation of the proposal by the DEP Wildlife Division should be requested. Consultation with the Wildlife Division should not be substituted for site-specific surveys that may be required for environmental assessments. If the proposed project has not been initiated within 6 months of this review, contact the NDDDB for an updated review. If you have any additional questions, please feel free to contact me at Julie.Victoria@ct.gov, please reference the NDDDB # at the bottom of this letter when you e-mail. Thank you for the opportunity to comment.

Sincerely,


Julie Victoria
Wildlife Biologist
Franklin Wildlife Management Area
391 Route 32
N. Franklin, CT 06254

cc: NDDDB – 16104



Vanasse Hangen Brustlin, Inc.

54 Tuttle Place
Middletown, Connecticut 06457
860 632-1500
FAX 860 632-7879

Memorandum

To: Mr. David Peter Castaldi
Civil Engineer and Wetlands Agent
Town of Bloomfield

Date: August 28, 2008

Project No.: 4145200

From: Mike Libertine

Re: CL&P Location Review
North Bloomfield Substation Expansion

Thank you for meeting with the Connecticut Light and Power (CL&P) team and allowing us the opportunity to present our project to the Inland Wetlands and Watercourses Commission at your August meeting. As a follow-up to comments contained in your August 14, 2008 memorandum and those made at the August 18th meeting, CL&P offers the following responses.

- Concern was raised about how the project could affect storm water runoff from adjacent properties (4 and 22 Hoskins Road). Existing runoff flow patterns from the adjacent house lots onto CL&P's property will remain unaltered to promote adequate drainage away from these abutting properties.
- Tree clearing activities will be necessary on both sides of Griffin Brook to accommodate new lines and structures. Sufficient room exists on the property to reestablish riparian vegetated buffers. Specific areas where additional trees and shrubs can be planted as riparian buffers will be identified in subsequent filings with the Connecticut Siting Council.
- Additional vegetative screening between existing residences and the substation expansion is under consideration. A landscape plan, including tree and shrub plantings for screening will be developed and included in subsequent filings with the Connecticut Siting Council.
- Excess soil generated as a result of grading the expansion area will be removed from the property.
- Soil and erosion control measures will be implemented during earthwork and construction phases of the project in accordance with the 2002 *Connecticut Guidelines for Soil Erosion and Sediment Control*. CL&P will perform construction sequencing to minimize the time earth materials are exposed before they are properly stabilized or otherwise controlled to prevent erosion. Upon completion of construction, exposed ground areas will be stabilized with trap rock or other ground cover.
- CL&P anticipates that the Army Corp of Engineers (ACOE) will require wetland mitigation for impacts resulting from the Greater Springfield Reliability Project and that mitigation will be addressed on a project-wide basis. CL&P will be working with the ACOE to determine suitable locations for mitigation.

MEMORANDUM

TO: Bloomfield Inland Wetlands and Watercourses Commission
FROM: David Peter Castaldi, Civil Engineer and Wetlands Agent 
DATE: August 14, 2008

**RE: Northeast Utilities/ Connecticut Light & Power – Location Review
Expansion of Hoskins Road/ Tariffville Road Substation**

This property is located at the northerly end of Hoskins Road, on the east side, and south of Tariffville Road opposite Saint Andrew's Church and cemetery. The substation is located behind 4 and 22 Hoskins Road. There are wetlands and watercourses to the north, south and east of the existing substation. Griffin Brook flows south to north through the property just to the east of the substation. A small watercourse drains areas on the west side of Hoskins Road, around the southerly end of the substation, and joins with Griffin Brook south of the proposed expansion area.

This project is part of a multi-state upgrade of the Northeast Utilities/ Connecticut Light & Power (NU/CL&P) electric power grid. The plan is to expand the existing Hoskins Road/ Tariffville Road substation to the southeast and behind 24-, 26 and 28 Hoskins Road. See enclosed plans and GIS plot.

This project falls under the Connecticut Siting Council's authority and local (Town) permits from the Wetlands or Planning Commission are not required. However, permits from the DEP and/or Army Corps of Engineers (ACOE) will be required.

The plans indicate a flagged wetlands line that is significantly different than the Official Map which appears to be in error and shows wetlands within the gravel surface of the existing substation and surrounding the barn at 4 Hoskins Road.

The proposed expansion will impact a large area of wetlands and a small area of the Griffin Brook flood hazard zone. Overhead feeder lines and poles will be installed for the new expansion near its southerly end and will require clearing of some trees on both sides of Griffin Brook.

A presentation will be made by NU/CL&P consultants for information purposes only. This location review is one of the first steps in the public information stage of the project. NU/CL&P are looking for comments from the Commission in writing.

There will be a formal Public Hearing before the Siting Council in the near future when residents' comments and feedback will be heard.

The property available for the expansion includes significant areas of inland wetlands, watercourses and some of the floodplain of Griffin Brook. The project will result in a large area of filled wetlands and some mitigation should be provided.

The main issue from the Wetlands point of view is the impact to the wetlands and watercourses from the regulated activities (mostly grading, filling and clearing) required for the construction of the expansion. The present plan does not include any direct watercourse impacts. The impacts to the wetlands appear to be fairly significant and NU/CL&P anticipate that an ACOE permit will be necessary. The ACOE normally requires wetland mitigation for wetland impacts and will in all likelihood require mitigation for this project as well. The plans are preliminary and final plans will show mitigation if required by ACOE.

There is concern about the affect this project will have on the adjacent properties especially 4 and 22 Hoskins Road. Any existing runoff flow patterns from the house lots onto or adjacent to the proposed expansion should be maintained and not altered with this project.

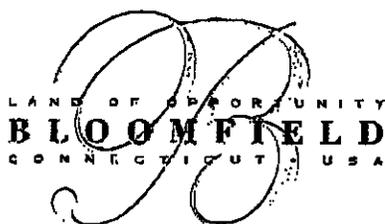
The clearing of trees on both sides of Griffin Brook for the new feeder lines and poles is necessary to install and maintain these lines. There appears to be some areas where additional trees could be planted as riparian vegetated buffers, adjacent to the east side of the substation outside of the existing fence line.

The planting of trees and shrubs for screening between the existing residences and the substation should also be considered.

The proposed expansion may require regrading of existing material. Excess materials should be removed from the property.

The need for soil erosion and sedimentation control measures is obvious for this project. Perimeter erosion controls, construction entrances, and prompt stabilization of exposed ground will be necessary.

A field inspection of the proposed expansion area will be made before the Wetlands meeting and an update will be given verbally at the meeting.



*Department of
Planning & Zoning*

TOWN OF BLOOMFIELD
800 BLOOMFIELD AVENUE
BLOOMFIELD
CONNECTICUT 06002
TEL 860.769.3515
FAX 860.769.3507

September 2, 2008

Mr. Jeffery M. Towle
Project Manager
Transmission Business -- Projects
Northeast Utilities Service Company
107 Seldon Street
Berlin, CT 06037

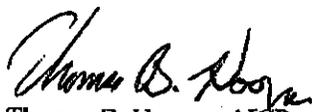
Dear Mr. Towle:

The Bloomfield Town Plan and Zoning Commission, at its regular meeting of August 28, 2008, reviewed the proposed North Bloomfield substation expansion as submitted August 7, 2008. It was the consensus of the Commission that this expansion was necessary and that since the facility had existed at the present location for over 50 years, the use would not be a detriment to the surrounding residential neighbors. In general, the Commission supported the plan as it would improve the service and reliability provided by Northeast Utilities to Bloomfield and the surrounding region.

The Commission also commended your organization for working with one neighbor in particular who had expressed concerns regarding your proposed expansion. Please continue to work with this person as the project moves forward.

Please feel free to contact me should you have any questions on this matter.

Sincerely,


Thomas B. Hooper, AICP
Director of Planning

CC: Marianne Barbino Dubuque



**Connecticut
Light & Power**

The Northeast Utilities System

107 Selden Street, Berlin, CT 06037
Northeast Utilities Service Company
P.O. Box 270
Hartford, CT 06141-0270
(860) 665-5000

September 15, 2008

Ms. Dawn McKay, Biologist
Connecticut Department of Environmental Protection
Natural Diversity Database
Bureau of Natural Resources
Wildlife Division
79 Elm Street, Sixth Floor
Hartford, CT 06106

**RE: Update on the Connecticut Light and Power Greater Springfield Reliability Project
Rare Species Surveys**

Dear Ms. McKay:

This letter updates the Connecticut Department of Environmental Protection (CT DEP) on rare species surveys performed in connection with the Greater Springfield Reliability Project (GSRP or the Project), and seeks to confirm that Northeast Utilities Service Company (NU) and Connecticut Light and Power (CL&P) have followed the CT DEP's directives for the GSRP and requests confirmation from the CT DEP. For your convenience, a chronological summary of rare species deliberations, correspondence and activities to date for the GSRP is provided below.

Initial Identification of GSRP Scope and Resulting Rare Species

CL&P originally submitted a rare species request for the GSRP to the Natural Diversity Database, Environmental & Geographic Information Center (NDDDB) in a letter dated October 1, 2007 (Attachment A). Attached to this letter were three (3) sets of U.S.G.S topographic maps. These consisted of:

- one (1) set of four (4) maps entitled GSRP Natural Diversity Map: Connecticut Agawam to North Bloomfield Substation (Sheets 1 through 4),
- one (1) set of three (3) maps entitled GSRP Natural Diversity Map: Connecticut Ludlow to Agawam Substation and,
- one (1) set of two (2) maps entitled GSRP Natural Diversity Map: Connecticut Southwick to Granby Junction.

As currently proposed, the GSRP only includes the first two sets of these maps. The Southwick to Granby Junction component has been removed from the Project scope. However, subsequent to the October 1, 2007 CL&P letter, CL&P added another component to the Project. This new component is known as Manchester Substation to Meekville Junction component and is located in Manchester, CT. CL&P submitted a rare species request for this component of the GSRP in a letter dated April 7, 2008. This

letter had an attachment of one U.S.G.S. map entitled GSRP Natural Diversity Map: Meekville Jct. to Manchester Substation (Attachment B). The CT DEP has responded to the October 1, 2007 NU request with two (2) letters, one (1) dated March 10, 2008 from Ms. Julie Victoria (Attachment C) and the other dated March 17, 2008 from Ms. Dawn McKay (Attachment D).

CL&P notes that the CT DEP response letter dated March 10, 2008 included rare species which were limited to the set of four (4) U.S.G.S. maps (Preferred or Northern Route). No species were included for either the set of three (3) (Noticed Alternative or Southern Route) or the set of two (2) maps (Southwick to Granby Junction). As noted above, the Southwick to Granby Junction route is no longer a part of the Project. NU further notes, that the March 17, 2008 CT DEP response letter from Ms. Dawn McKay included one plant species from the set of four (4) U.S.G.S. maps (Preferred Route or Northern Route) and three (3) plant species from the set of two (2) maps (Southwick to Granby Junction). As previously noted, the Southwick to Granby Junction route is no longer a part of the Project, therefore this route will not be surveyed for the presence of any rare species. In addition, the CT DEP has responded to the April 7, 2008 CL&P rare species request letter with a letter from Ms. Julie Victoria dated April 24, 2008 (Attachment E). As a result of a review of all CT DEP letters pertaining to rare species, CL&P has generated a rare species summary table, which lists all of the rare species associated with the Project as well as which Project segment they occur on (Attachment F).

During the course of the T&E correspondence described above, ENSR and Burns and McDonnell (environmental and engineering consultants retained by CL&P to assist with the Project) met with the CT DEP on April 1, 2008 to discuss in more detail the potential rare species implications for the GSRP. The following is a summary of the rare species surveys and related activities ENSR has completed thus far for the Connecticut component of the GSRP, as well as a species specific discussion on anticipated actions.

Field Surveys for Rare Animal Species

Jefferson Salamander (*Ambystoma jeffersonianum*)

The March 10, 2008 CT DEP response letter indicated the potential presence of Jefferson Salamanders on or in close proximity to the Project ROW in East Granby, CT. During the April 1, 2008 meeting the CT DEP recommended egg mass surveys as well as live trapping using minnow traps in an effort to locate breeding adults.

As directed by the CT DEP, Jefferson Salamander surveys were conducted on the ROW in East Granby, CT in the Spring of 2008. The surveys were performed in accordance with a protocol submitted by ENSR to CT DEP and under a Scientific Collection Permit issued by the CT DEP. The mapping used for the field surveys was generated by ENSR with data obtained from the Connecticut Natural Diversity Database (CT NDDDB).

As a result of the surveys, ENSR has confirmed the presence of Jefferson Salamanders on the ROW in East Granby, CT. Shortly after the surveys were completed, ENSR generated and submitted a Special Animal Survey Form and supporting materials, including mapping to the CT DEP, which documented their findings. The CT DEP may require seasonal restrictions on work activities in these areas to reduce any potential negative impacts to the species.

Barn Owl (*Tyto alba*)

In response to NU's April 7, 2008 rare species information request sent to the CT NDDDB, the CT DEP responded with a letter dated April 24, 2008. This data request was specific to the Manchester Substation to Meekville Junction component of the GSRP. In the CT DEP response letter, it was indicated that the state has historic records of a state endangered species, the Barn Owl, in the vicinity of the Project site. The letter further indicated that if the proposed work was to take place in Barn Owl habitat that an ornithologist familiar with the requirements of this species conduct surveys. In response to that request, ENSR wildlife biologists performed field surveys for this species and documented their findings in a report dated July, 2008 (Attachment G). As a result of the surveys, ENSR has identified extremely limited Barn Owl foraging habitat on the ROW (as shown in Figure one of Attachment G) and no areas/sites suitable for breeding.

Field Surveys for Rare Plant Species

The CT DEP's March 17, 2008 response letter indicated two areas within which rare plants were a potential concern. One area was encompassed within the Southwick to Granby Junction ROW which is no longer a component of the Project. Accordingly, no surveys are planned for this location. The other area was indicated to be on the CL&P ROW just north of the Farmington River in East Granby, CT (part of the Preferred or Northern Route). This area was identified as potentially supporting a population of Bush's Sedge. In that letter, the DEP asked that a survey be done and if these plants were located indicated they would need to be avoided and/or transplanted so as to avoid negative impacts as a result of any construction activities.

As directed by the CT DEP, on June 26, 2008 ENSR performed a survey for Bush's Sedge (*Carex bushii*) on the ROW in East Granby, CT. As a result of the survey, ENSR has confirmed the presence of a small population of this rare sedge on the ROW. ENSR is in the process of generating a Special Plant Survey Form and supporting materials and intends to submit the package to the CT DEP in the near future.

Additional Rare Species Concerns

Eastern Box Turtle (*Terrapene carolina*)

As a result of the aforementioned April 1, 2008 meeting with the CT DEP, several issues were discussed regarding box turtles. The CT DEP is recommending habitat characterization surveys to determine the locations of potentially suitable habitats, pre-construction sweep surveys to locate and remove any box turtles from the active work areas, pre-construction reconnaissance surveys for nesting habitat, installation of turtle exclusion fencing, contractor awareness training and the parking of equipment on established roadways and other designated areas at night, as opposed to areas that could potentially serve as box turtle habitat. The CT DEP further stated their concern relative to clearing and grubbing activities, which may be required. If clearing and grubbing becomes a necessity, the DEP would prefer to see it done during the active period for the box turtles (late Spring, Summer and early Fall) to avoid disturbing the turtles when they are dormant.

Freshwater Mussels

Three species of freshwater mussels have been identified by the CT NDDB as potentially occurring within close proximity to the Project area. These species are the Eastern Pearlshell mussel (*Margaritifera margaritifera*), the dwarf wedgemussel (*Alasmidonta heterodon*) and the Eastern Pond mussel (*Ligumia nasuta*). Two of these, the Eastern Pond mussel and the dwarfwedge mussel are mapped by the CT NDDB as potentially occurring in the Farmington River near the Spoonville Bridge. This location is over 2,000 feet to the southeast of the Project ROW. The third species, the Eastern Pearlshell mussel may potentially occur in a headwater tributary stream to Muddy Brook, on the ROW in East Granby, CT. ENSR will determine the status of the watercourse and make a determination as to the suitability of this feature relative to providing habitat for the mussel. According to the CT DEP this watercourse would not provide habitat if it were intermittent.

The CT DEP has stressed the importance of proper installation and maintenance of erosion and sediment controls as well as maintaining an undisturbed riparian buffer zone to the subject waterbodies.

Odonates

The Arrow Clubtail Dragonfly (*Stylurus spiniceps*), has been identified by the CT NDDB as potentially occurring in close proximity to the Project. According to the CT DEP, if there are no in-water work activities proposed, odonates are not a concern. However, as with the freshwater mussels, the CT DEP has stressed the importance of proper installation and maintenance of erosion and sediment controls as well as maintaining an undisturbed riparian buffer zone to the subject waterbodies. In addition, the habitat provided by the Farmington River in the Spoonville Bridge area has been identified as critically important. As noted above, this location is over 2,000 feet to the southeast of the Project ROW.

Conclusions

CL&P is currently refining the constructability mapping for the project and then will seek to meet with the CT DEP in the coming months to develop appropriate rare species mitigation measures for the GSRP.

CL&P requests a letter response from the CT DEP confirming that we are in possession of all data pertaining to rare species for both the Preferred Route (Northern Route) and the Noticed Alternative (Southern Route) as they relate to the GSRP in Connecticut. In addition, we request concurrence that our proceedings to date are consistent with the expectations and goals of the CT DEP relative to the GSRP.

Thank you for your attention to this project. If you have questions pertaining to any of the information within this report please call me at 860-665-4861 (marotsa@nu.com) or Tim O'Sullivan of ENSR at 860-429-5323, extension 229 (tosullivan@ensr.aecom.com).

Sincerely,

Northeast Utilities Service Company

A handwritten signature in black ink, appearing to read "Scott Marotta". The signature is fluid and cursive, with a large loop at the end.

Scott A. Marotta
Environmental Scientist

Attachments: A NU rare species data request, dated October 1, 2007
B NU rare species data request dated April 7, 2008
C CT DEP response letter dated March 10, 2008
D CT DEP response letter dated March 17, 2008
E CT DEP response letter dated April 24, 2008
F GSRP CT rare species summary table
G Inventory of Potential Breeding Birds and Habitats Addendum

CC: Julie Victoria (CT DEP)
J. Towle (NU)
D. Lukehart (NU)
D. Biondi (NU)
J. Fan (B&McD)
D. Cameron (ENSR)
J. Durand (ENSR)
T. O'Sullivan (ENSR)
R. Child (Mintz Levin)