

INLAND WETLANDS DELINEATION REPORT

**THE UNITED ILLUMINATING COMPANY
OPERATIONS CENTER SITE
100-110 AND 114 MARSH HILL ROAD
ORANGE, CONNECTICUT**

August 17, 2009

MMI #2982-02-8

Prepared for:

The United Illuminating Company

Prepared by:

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1.0 INTRODUCTION

This Inland Wetland Delineation Report was prepared in connection with applications submitted by The United Illuminating Company (UI) to the Inland Wetlands and Watercourses Commission for the Town of Orange to construct an operations center (the "Application").

The 34-acre site is located in the southern portion of the Town of Orange at 100-110 and 114 Marsh Hill Road. It is bordered by I-95 to the south and southeast, Marsh Hill Road to the east, an existing hotel and restaurant development to the north, and residential properties to the west. The site was previously developed as a Showcase Cinema complex with access off Marsh Hill Road. The western portion of the property remains mostly wooded and undeveloped. The majority of this undeveloped area is located within a conservation easement, which was established as a condition of the original approval of the Showcase Cinema project.

The proposed project involves the construction of an operations center with office space, warehouse space, a training facility, a parking garage and surface parking areas and associated improvements.

2.0 DRAINAGE BASINS

The State of Connecticut has assigned identification numbers to each watershed in the state. The subject property is located in the South Central Coast Drainage Basin, #5306. Drainage flows generally from the north to the south toward Indian River and Indian Lake. These waterbodies receive substantial input from commercial and residential development areas adjacent to Route 1 and Route 152. As a result, these waterbodies are classified as Class B (Indian Lake) and Class C-D/B (Indian River).

3.0 SOIL TYPES

On November 4, 2008, William A. Root, a certified professional soil scientist with Milone & MacBroom, Inc. (MMI), conducted a site inspection of the subject property as it is depicted on the plans submitted in support of the Application (the "Plans"). Inland wetlands and watercourses on the site were delineated in accordance with the regulations of the Town of Orange, Connecticut and the State of Connecticut *Inland Wetlands and Watercourses Act*, CGS 22a-36 through 45. Regulated wetland areas consist of any of the soil types designated by the National Cooperative Soils Survey as poorly drained, very poorly drained, alluvial, or floodplain. Regulated watercourses consist of rivers; streams; brooks; waterways; lakes; ponds; marshes; swamps; bogs; and all other bodies of water, natural or artificial, vernal or intermittent, public or private, not regulated pursuant to sections 22a-28 to 22a-35 inclusive (tidal wetlands).

Weather conditions were clear and dry, and the ground was frost free. Ground water conditions were moderately high, and standing water was observed within many of the wetlands areas. Intermittent watercourses in the surrounding area were flowing. Site conditions were suitable for wetland delineation work. Soils were examined using a spade and Dutch auger. Generally, soils were explored to a depth of 24 inches looking for signs of wetness including redoximorphic features (mottling) and gleyed soil horizons. Hydrophytic vegetation was also observed as an aid to locating regulated wetland areas. Upland soils were explored by walking transects over the landscape and examining soils to a depth of 24 inches.

Wetland and watercourse boundaries were marked with sequentially numbered, colored flagging affixed to sturdy vegetation to facilitate survey work. Generally, flags were placed about 50 feet apart, or as needed, to best define the wetland/upland boundary. Geospatial data was accessed via the National Cooperative Soil Survey maintained by the United States Department of Agriculture (USDA) – Natural Resources Conservation Service (NRCS) to determine current soil survey mapping for the project site. This soils map is attached as Figure 1. The field work and the survey identified the following mapping units on the property:

3.1 Upland Soils

The native soils on this site are a mix of stratified glaciofluvial soils and unstratified glacial till soils. The parent material consists of acidic crystalline rocks and schist, granite, and gneiss. There has been substantial reworking of the native soil and extensive areas of filling (*Udorthents*). The dominant native, upland soils are:

- *Ninigret and Tisbury* soils (moderately well drained)
- *Agawam*, fine sandy loam (well drained)
- *Canton and Charlton* soils (well drained)
- *Charlton-Chatfield* soils (well drained)
- *Paxton and Montauk* soils (well drained)
- *Udorthents-Urban* land

Upland soils were examined and sampled during the course of the wetland investigation, but their precise boundaries were not fully delineated in the field.

3.2 Wetland Soils

The NRCS resource mapping identifies only one area of wetland soils on the subject property. As shown on the attached Web Soil survey map, it is located immediately west of the former cinema building near I-95. This does not mean that no other wetland soils occur on the site. Typically, small pockets of wetland soils (less than two acres) and intermittent watercourses are not shown at the scale of these published maps. Our detailed site investigation identified several areas of wetlands and intermittent watercourses as indicated on the application drawings. The wetland soils are in the *Leicester* series, *Raypol* series, and the *Timakwa* series, as described below.

3.2.1 The Leicester Series

The *Leicester* series consists of very deep, poorly drained loamy soils formed in friable till. They are nearly level or gently sloping soils in drainageways and low-lying positions on hills. Slope ranges from 0 to eight percent. Permeability is moderate or moderately rapid in the surface layer and subsoil and moderate to rapid in the substratum. Mean annual temperature is about 50 degrees F., and mean annual precipitation is about 47 inches.

TAXONOMIC CLASS: Coarse-loamy, mixed, active, acid, mesic Aeric Endoaquepts.

DRAINAGE AND PERMEABILITY: Poorly drained. Surface runoff is slow. Permeability is moderate or moderately rapid in the solum and moderate to rapid in the substratum. *Leicester* soils have a water table at or near the surface much of the year.

USE AND VEGETATION: Most areas are wooded. Some areas are in brushy unimproved pasture. Cleared areas are used for hay or pasture. Common trees are red maple, red oak, elm, yellow birch, white pine, and ironwood.

3.2.2 The Raypol Series

The *Raypol* series consists of very deep, poorly drained soils formed in loamy over sandy and gravelly outwash. They are nearly level to gently sloping soils in shallow drainageways and low-lying positions on terraces and plains. Slope ranges from 0 to five percent. The soils have a water table at or near the surface much of the year. Mean annual temperature is about 50 degrees F., and mean annual precipitation is about 47 inches.

TAXONOMIC CLASS: Coarse-loamy over sandy or sandy-skeletal, mixed, active, acid, mesic Aeric Endoaquepts.

DRAINAGE AND PERMEABILITY: Poorly drained. Surface runoff is slow. Permeability is moderate in the solum and rapid or very rapid in the coarse-textured substratum. *Raypol* soils have a water table at or near the surface much of the year.

USE AND VEGETATION: Most areas are wooded. Cleared areas are used for hay and pasture. Drained areas are used for silage corn, hay, or vegetables. Common trees are red maple, white oak, white ash, elm, white pine, and hemlock.

3.2.3 The Timakwa Series

The *Timakwa* series consists of very deep, very poorly drained soils formed in woody and herbaceous organic materials over sandy deposits in depressions on lake plains, outwash plains, till plains, moraines, and floodplains. Saturated hydraulic conductivity is moderately low to high in the organic layers and high or very high in the sandy material. Slope ranges from 0 to two percent. Mean annual temperature is about 48 degrees F, and the mean annual precipitation is about 47 inches.

TAXONOMIC CLASS: Sandy or sandy-skeletal, mixed, euic, mesic Terric Haplosaprists.

DRAINAGE AND PERMEABILITY: Very poorly drained. Depth to the seasonal high water table ranges from one foot above the surface to one foot below the surface from October to June. Surface runoff is negligible or very low. Saturated hydraulic conductivity is moderately low to high in the organic layers and high or very high in the sandy material.

USE AND VEGETATION: Most areas are used for wildlife or are in woodland or clear-cut woodland. Some of these soils are used for pasture. Common vegetation is red maple, skunk cabbage, and sphagnum moss.

4.0 WETLAND ASSESSMENT

4.1 Wetland Cover Types

Wetland cover types present on the property have been described and categorized using the U.S. Fish and Wildlife Service's wetland classification system described in *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin, et al., 1979). All of the wetlands on the site belong to the Palustrine ecological system, which includes nontidal wetlands dominated by trees, shrubs, persistent emergent species, and emergent mosses or lichens. Ponds and watercourses are also included within this system. Wetland cover types present on site include:

- Palustrine forested
- Palustrine scrub-shrub
- Palustrine persistent emergent/wet meadow

4.2 Wetland Functions and Values

Wetlands possess the capacity to perform a variety of ecological and societal functions. These vary depending on the specific characteristics of the wetland being evaluated. The wetlands on the site were assessed in order to identify the functions and values that they provide. The principal functions and values of each wetland are identified in the following text using the ACOE method (*U.S. Army Corps of Engineers. 1993. The Highway Methodology Workbook with Functions and Values Supplement*). In the text following each wetland area, a Functions and Values table is provided.






5.0 WETLAND DESCRIPTIONS




The wetlands described below are shown and identified on the Topographical Survey included in the Plans submitted with the Application.

5.1 W1 – W18

This is a highly disturbed, isolated wetland depression located at the toe of the fill slope supporting the cinema building and its parking lots as depicted on the plans. It abuts I-95 southbound. The soils are rocky and show evidence of prolonged saturation in the past. However, the current condition is much drier and facultative, and even upland plant species dominate the wetland. Prior site disturbances may have intercepted hydrology to this area. Fill piles and debris are common. The area is forested, but only a few large diameter trees occur.

TABLE 1

| | <i>Wetland Functions and Values</i> W1 – W18 | Occurrence Yes / No |
|---|--|-------------------------------|
|  | Ground Water Recharge / Discharge | Yes |
|  | Floodflow Alteration (Storage & Desynchronization) | No |
|  | Fish & Shellfish Habitat | No |
|  | Sediment / Toxicant Retention | Yes |
|  | Nutrient Removal / Retention / Transformation | Yes |
|  | Production Export (Nutrient) | Yes |
|  | Sediment / Shoreline Stabilization | No |
|  | Wildlife Habitat | Yes |
|  | Recreation (Consumptive & Non-Consumptive) | No |

| | <i>Wetland Functions and Values</i> W1 – W18 | Occurrence Yes / No |
|---|---|-------------------------------|
|  | Educational Scientific Value | No |
|  | Uniqueness / Heritage | No |
|  | Visual Quality / Aesthetics | No |
| ES | Endangered Species | No |













The principal functions and values of this system within this watershed are:

- None – This small area contributes little either locally or regionally. The retention/detention function could serve to trap and treat runoff.

5.2 W21 – W46

The wetland begins near I-95 southbound at a drainage discharge structure. The flagging proceeds westerly and encompasses a former wetland mitigation area and a large, permanently flooded pool. There is a discharge into the pool from a drainage swale west of the pool at W33 as depicted on the Plans. The swale conveys runoff from the cinema parking lots. An outlet structure from the pool is located at W38. It supports an intermittent watercourse (W71-W81) that drains off the property to the south. The pond is ringed by a steep berm of fill but, near the high water line, it does support hydrophytic trees and shrubs. Both floating and rooted aquatic plants were observed. Fish and green frogs were noted as were painted and snapping turtles. A few spotted salamander egg masses were observed near the pond outfall, but all had been eaten. The permanent nature of the pool precludes successful breeding by vernal pool obligate species, and the heavily disturbed surroundings provide low quality upland habitat. The pond does not function as a vernal pool.

TABLE 2

| | <i>Wetland Functions and Values</i> W21 – W46 | Occurrence Yes / No |
|---|--|-------------------------------|
|  | Ground Water Recharge / Discharge | Yes |
|  | Floodflow Alteration (Storage & Desynchronization) | Yes |
|  | Fish & Shellfish Habitat | Yes |
|  | Sediment / Toxicant Retention | Yes |
|  | Nutrient Removal / Retention / Transformation | Yes |
|  | Production Export (Nutrient) | Yes |
|  | Sediment / Shoreline Stabilization | No |
|  | Wildlife Habitat | Yes |
|  | Recreation (Consumptive & Non-Consumptive) | No |
|  | Educational Scientific Value | No |
|  | Uniqueness / Heritage | No |
|  | Visual Quality / Aesthetics | No |
| ES | Endangered Species | No |













The principal functions and values of this system within this watershed are:

- Stormwater detention and trapping of runoff contaminants
- Local wildlife habitat

5.3 W51-W64

This wetland consists of two linked, semipermanently flooded pools in close proximity to I-95 southbound. The area has a relatively closed tree canopy shading the terrain, and the more flooded sections are dominated by hydrophytic shrubs and herbaceous plants. The upper pool supported breeding by small numbers of spotted salamanders. The lower pool is not flooded long enough to provide such habitat. It was dry in April 2009.

TABLE 3

| | <i>Wetland Functions and Values</i> W51 – W64 | Occurrence Yes / No |
|---|--|-------------------------------|
|  | Ground Water Recharge / Discharge | Yes |
|  | Floodflow Alteration (Storage & Desynchronization) | No |
|  | Fish & Shellfish Habitat | No |
|  | Sediment / Toxicant Retention | No |
|  | Nutrient Removal / Retention / Transformation | No |
|  | Production Export (Nutrient) | Yes |
|  | Sediment / Shoreline Stabilization | No |
|  | Wildlife Habitat | Yes |
|  | Recreation (Consumptive & Non-Consumptive) | No |
|  | Educational Scientific Value | No |
|  | Uniqueness / Heritage | No |
|  | Visual Quality / Aesthetics | No |
| ES | Endangered Species | No |











The principal function and value of this system within this watershed is:



- Local wildlife habitat

5.4 W80-W136a

This flag sequence delineates the wetland boundary along the southern property edge. Most of the wetlands are off site; however, several troughs extend onto the site in the direction of the cinema parking lots. As with the first wetland described above (W1), these troughs (W93-W100a and W106a-W127a) have dried substantially over time and now support few hydrophytes.

TABLE 4

| | <i>Wetland Functions and Values</i> W80 – W136a | Occurrence Yes / No |
|---|--|-------------------------------|
|  | Ground Water Recharge / Discharge | Yes |
|  | Floodflow Alteration (Storage & Desynchronization) | Yes |
|  | Fish & Shellfish Habitat | No |
|  | Sediment / Toxicant Retention | Yes |
|  | Nutrient Removal / Retention / Transformation | Yes |
|  | Production Export (Nutrient) | Yes |
|  | Sediment / Shoreline Stabilization | No |
|  | Wildlife Habitat | Yes |
|  | Recreation (Consumptive & Non-Consumptive) | No |
|  | Educational Scientific Value | No |

| | <i>Wetland Functions and Values</i> W80 – W136a | Occurrence Yes / No |
|---|--|-------------------------------|
|  | Uniqueness / Heritage | No |
|  | Visual Quality / Aesthetics | No |
| ES | Endangered Species | No |













The principal functions and values of this system within this watershed are:

- None – the functions and values of the cinema site wetlands have deteriorated over time. They now provide drainage conveyance and may serve to trap and cleanse runoff. Off-site wetlands provide local wildlife habitat among other functions and values listed above.

5.5 W136a-W146a

This wetland is a small, apparently man-made pond. As shown on the plans, it is supported by an intermittent watercourse (W147a) and local ground water. It is permanently flooded. The overflow from the "dry" detention pond near the parking lots outlets to the pond but appears to flow infrequently. There is a low dam that impounds the pond. A small intermittent watercourse begins here and supports marshy wetlands off site. Although the margins of the pond are wooded, the open water section is wide enough that the pond is sunny and warm. There are rooted and floating aquatic plants. No fish were observed, but the pond is likely inhabited by a population of fish, frogs, and turtles similar to the larger pond described above (W21-W46). The pond is not a vernal pool.

TABLE 5

| | <i>Wetland Functions and Values</i> W136a-Wa146a | Occurrence Yes / No |
|---|---|-------------------------------|
|  | Ground Water Recharge / Discharge | Yes |
|  | Floodflow Alteration (Storage & Desynchronization) | Yes |
|  | Fish & Shellfish Habitat | Yes |
|  | Sediment / Toxicant Retention | Yes |
|  | Nutrient Removal / Retention / Transformation | Yes |
|  | Production Export (Nutrient) | Yes |
|  | Sediment / Shoreline Stabilization | No |
|  | Wildlife Habitat | Yes |
|  | Recreation (Consumptive & Non-Consumptive) | No |
|  | Educational Scientific Value | No |
|  | Uniqueness / Heritage | No |
|  | Visual Quality / Aesthetics | No |
| ES | Endangered Species | No |













The principal functions and values of this system within this watershed are:

- Stormwater detention and trapping of runoff contaminants
- Local wildlife habitat

5.6 W150a-W159a

This is a narrow trough near the entrance drive to the cinema site. It originates at the retaining wall of the Marriott building. An intermittent watercourse develops and drains both to the pond described in Section 4.4 and also westerly toward neighboring properties. The area is shrubby and lightly forested due to recent disturbances, perhaps during the construction of the cinema site and/or the Marriott facilities.

TABLE 6

| | <i>Wetland Functions and Values</i> W136a-Wa146a | Occurrence Yes / No |
|---|---|-------------------------------|
|  | Ground Water Recharge / Discharge | Yes |
|  | Floodflow Alteration (Storage & Desynchronization) | No |
|  | Fish & Shellfish Habitat | No |
|  | Sediment / Toxicant Retention | No |
|  | Nutrient Removal / Retention / Transformation | No |
|  | Production Export (Nutrient) | Yes |
|  | Sediment / Shoreline Stabilization | No |
|  | Wildlife Habitat | No |
|  | Recreation (Consumptive & Non-Consumptive) | No |
|  | Educational Scientific Value | No |
|  | Uniqueness / Heritage | No |
|  | Visual Quality / Aesthetics | No |
| ES | Endangered Species | No |

The principal functions and values of this system within this watershed are:

- None – this small trough provides only a conduit for seasonal discharge of shallow ground water.

6.0 AMPHIBIAN SURVEYS

As indicated earlier, MMI visited all areas of standing water, including the man-made ponds in early April 2009 to look for evidence of breeding by vernal pool obligate species, particularly amphibians. Only a few spotted salamander egg masses were observed as described within the description of each wetland in Section 5.

7.0 SUMMARY

Wetlands and watercourses on the site were mapped by a certified professional soil scientist and evaluated by a professional wetland scientist. Several classes of wetlands were identified on the site including small areas of scrub/shrub wetlands and larger tracts of forested wetlands. Several intermittent watercourses and man-made ponds were located. The permitted utilization of the site by the cinema operation resulted in the construction of retention/detention basins and swales and the collection and discharge of runoff to wetlands and presumably some wetland mitigation activities. Each of these altered the natural setting and the functions and values of the wetland systems on site.

If there are questions or comments regarding this report or the wetland systems described, please contact me.

Submitted by,

MILONE & MACBROOM, INC.

William A. Root
eh

William A. Root, M.E.S.
Certified Professional Soil Scientist
Senior Environmental Scientist

Attachments: Figure 1: Soils Map

References

Cowardin, L. M., Carter, F. C., Golet, E. T., LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Government Printing Office. Washington, D.C. GPO 024-010-00524-6. 103 pp.

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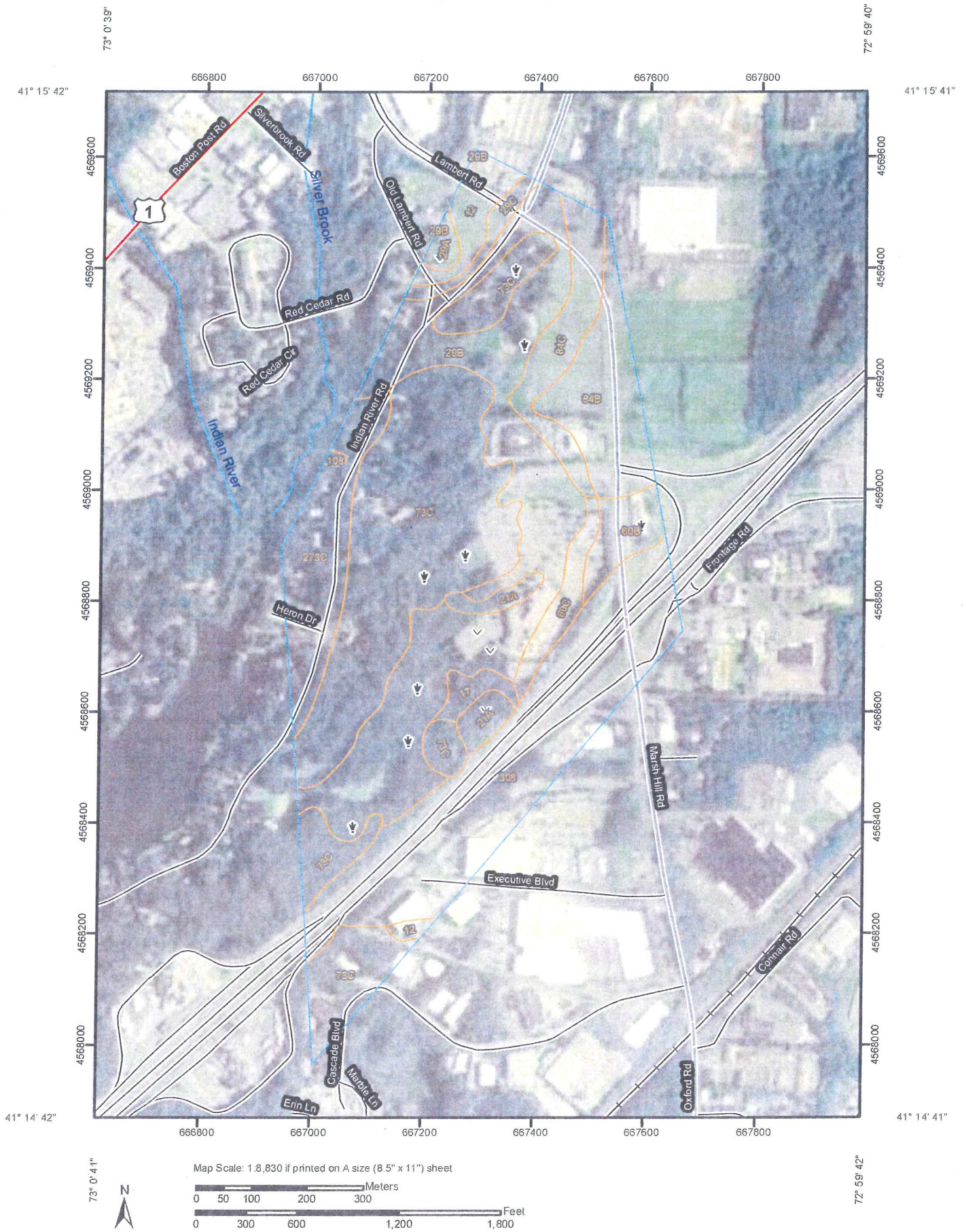
MAP LEGEND

| | | | |
|-------------------------------|------------------------|--|-----------------------|
| | Area of Interest (AOI) | | Very Stony Spot |
| | Soils | | Wet Spot |
| | Soil Map Units | | Other |
| Special Point Features | | | |
| | Blowout | | Special Line Features |
| | Borrow Pit | | Gully |
| | Clay Spot | | Short Steep Slope |
| | Closed Depression | | Other |
| | Gravel Pit | | Political Features |
| | Gravelly Spot | | Cities |
| | Landfill | | Water Features |
| | Lava Flow | | Oceans |
| | Marsh or swamp | | Streams and Canals |
| | Mine or Quarry | | Transportation |
| | Miscellaneous Water | | Rails |
| | Perennial Water | | Interstate Highways |
| | Rock Outcrop | | US Routes |
| | Saline Spot | | Major Roads |
| | Sandy Spot | | Local Roads |
| | Severely Eroded Spot | | |
| | Sinkhole | | |
| | Slide or Slip | | |
| | Sodic Spot | | |
| | Spoil Area | | |
| | Stony Spot | | |

MAP INFORMATION

Map Scale: 1:8,830 if printed on A size (8.5" x 11") sheet.
 The soil surveys that comprise your AOI were mapped at 1:12,000.
 Please rely on the bar scale on each map sheet for accurate map measurements.
 Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
 Coordinate System: UTM Zone 18N NAD83
 This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.
 Soil Survey Area: State of Connecticut
 Survey Area Data: Version 6, Mar 22, 2007
 Date(s) aerial images were photographed: 8/14/2006
 The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Soil Map—State of Connecticut
(Figure 1 - Soils Map)



Map Unit Legend

| State of Connecticut (CT600) | | | |
|------------------------------|--|--------------|----------------|
| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
| 12 | Raypol silt loam | 4.4 | 2.6% |
| 17 | Timakwa and Natchaug soils | 1.7 | 1.0% |
| 21A | Ninigret and Tisbury soils, 0 to 5 percent slopes | 3.1 | 1.8% |
| 29A | Agawam fine sandy loam, 0 to 3 percent slopes | 1.1 | 0.6% |
| 29B | Agawam fine sandy loam, 3 to 8 percent slopes | 39.3 | 22.9% |
| 29C | Agawam fine sandy loam, 8 to 15 percent slopes | 1.9 | 1.1% |
| 60B | Canton and Charlton soils, 3 to 8 percent slopes | 3.9 | 2.3% |
| 60C | Canton and Charlton soils, 8 to 15 percent slopes | 3.6 | 2.1% |
| 73C | Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky | 48.8 | 28.4% |
| 84B | Paxton and Montauk fine sandy loams, 3 to 8 percent slopes | 11.2 | 6.5% |
| 84C | Paxton and Montauk fine sandy loams, 8 to 15 percent slopes | 7.9 | 4.6% |
| 108 | Saco silt loam | 0.2 | 0.1% |
| 273C | Urban land-Charlton-Chatfield complex, rocky, 3 to 15 percent slopes | 11.8 | 6.8% |
| 306 | Udorthents-Urban land complex | 33.2 | 19.3% |
| Totals for Area of Interest | | 172.1 | 100.0% |