

**KLEINFELDER**  
EXPECT MORE®

October 26, 2007

Mr. Paul Lusitani  
Clough Harbour & Associates, LLP.  
2139 Silas Deane Highway  
Suite 212  
Rocky Hill, CT 06067-2336

**RE: Wetland & Watercourse Delineation Report  
Thompson 98A  
347 Riverside Drive  
North Grosvenordale (Thompson), Connecticut**

Dear Mr. Lusitani:

Kleinfelder East, Inc. (Kleinfelder) completed an on-site investigation to determine the presence or absence of wetlands and/or watercourses on the above referenced property (347 Riverside Drive, North Grosvenordale (Thompson), CT), as requested and authorized. This investigation involved a wetland/watercourse delineation that was completed by a qualified staff soil scientist and conducted in accordance with the principles and practices noted in the United States Department of Agriculture (USDA) Soil Survey Manual (1993). The soil classification system of the National Cooperative Soil Survey was used in this investigation to identify the soil map units present on the project site.

**INVESTIGATION**

The project site was investigated on July 10, 2007, with a temperature in the 80s under sunny conditions. Soil types are identified by observing soil morphology (soil texture, color, structure, etc.). To observe the morphology of the soils, numerous test pits and/or hand borings (generally to a depth of at least two feet) are completed. During the investigation no wetlands or watercourses were observed or identified within the 200 foot lease area. The nearest wetlands or watercourse appear to be on the opposite site of Riverside Drive approximately 400 feet from the lease area along the French River. These wetlands were not flagged or identified.

**REGULATORY INFORMATION**

Wetlands and watercourses are regulated by both state and federal law each with different definitions and regulatory requirements. Accordingly, the State may regulate waters that fall outside of federal jurisdiction; however, where federal jurisdiction exists concurrent State jurisdiction is almost always present.

**State Regulation**

*Wetland* determinations are based on the presence of poorly drained, very poorly drained, alluvial, or floodplain soils and submerged land. *Watercourses* are defined as "rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs and all other bodies of water, natural or artificial, vernal or intermittent, public or private, which are contained within, flow through or border upon the state or any portion thereof." *Intermittent watercourse* determinations are made based on the presence of a defined permanent channel and bank, and two of the following characteristics: (1) evidence of scour or deposits of recent alluvium or detritus, (2) the presence of standing or flowing water for a duration longer than a particular storm incident, and (3) the presence of hydrophytic vegetation. (See Inland Wetlands and Watercourses Act §22a-38 CGS.)

## WETLAND AND WATERCOURSE SITE DESCRIPTION

There were NO inland wetlands or watercourses identified on the project site.

### Upland Area Description

At the time of the site visit, the land surface in the area of the proposed tower was predominately devoid of vegetation (refer to attached photos). Soils within the 200 foot lease area appeared to be altered (e.g., filled/excavated). The vegetation listed above existed around the edges of the lease area.

**TABLE 1: Predominate Vegetation within the Upland Area (Common (Scientific) names)**

UPLAND AREA	
TREES & SAPLINGS	
Red maple ( <i>Acer rubrum</i> )	
White oak ( <i>Quercus alba</i> )	
White pine ( <i>Pinus strobus</i> )	
Yellow birch ( <i>Betula alleghaniensis</i> )	
SHRUBS	
Multiflora rose ( <i>Rosa multiflora</i> )*	
HERBS/VINES	
Fancy wood fern ( <i>Dryopteris intermedia</i> )	
Goldenrod sp. ( <i>Solidago sp.</i> )	
Multiflora rose ( <i>Rosa multiflora</i> )*	
Virginia creeper ( <i>Parthenocissus quinquefolia</i> )	
*Denotes State Listed non-native invasive species	

### SOIL MAP TYPES

A brief description of each soil map unit identified on the project site is presented below including information from the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soil descriptions. For further information on these and other soils, please refer to the internet site at <http://soils.usda.gov/technical/classification/osd/index.html>. The soil survey map and soil identification pages for the project site are attached.

#### Upland Soils

##### **Hinckley (38C and 38E) gravelly sandy loam – 3 to 45 percent slopes \*(38C & 38E)**

This soil type is excessively drained, with surface drainage runoff being very low. Hinckley soils are nearly level to very steep soils on terraces, outwash plains, deltas, kames, and eskers, and occur in glacial outwash parent material. The slope of the HkC soil map unit is 3-15 percent and HkD is 15-35 on the landscape.

##### **Udorthents (306) smoothed (variable fill material)**

This unit consists of areas that have been altered by cutting or filling. Slopes are mainly 0 to 25 percent. The material in these areas is mostly loamy, and in the filled areas it is more than 20 inches thick. Some of the filled areas are on flood plains, in tidal marshes, and on areas of poorly drained and very poorly drained soils. Included with this unit in mapping are small areas of soils that have not been cut or filled. Also included are a few larger urbanized areas and a few small areas containing material such as logs, tree stumps, and concrete. A few areas have exposed bedrock. Included areas make up about 30 percent of this map unit. The properties and characteristics of this unit are variable, and the unit requires onsite investigation and evaluation for most uses. This unit is not assigned to a capability subclass.

**Canton and Charlton Soils, 3 to 15 percent slopes, very stony**

**Canton Soils** - The Canton series consists of very deep, well drained soils formed in a loamy mantle underlain by sandy till. They are on nearly level to very steep glaciated plains, hills, and ridges. Slope ranges from 0 to 35 percent. Saturated hydraulic conductivity is high in the solum and high or very high in the substratum. Diagnostic horizons and features recognized in this pedon include an ochric epipedon in the zone from 0 to 2 inches (A and E horizons), a cambic horizon in the zone from 2 to 22 inches (Bw1 and Bw2 horizons), contrasting particle size in the coarse-loamy material containing less than 50 percent fine or coarser sand, and a transition zone between the two parts of the particle-size control section that is less than 12.5 cm (5 in.) thick. Canton soils also have lithologic discontinuity shown through an abrupt change in sand distribution at 22 inches (2C1 horizon). There is also a cation exchange activity class based upon available data for 4 pedons.

**Charlton Soils** - The Charlton series consists of very deep, well drained loamy soils formed in till. They are nearly level to very steep soils on till plains and hills. Slope ranges from 0 to 50 percent. Saturated hydraulic conductivity is moderately high or high. The diagnostic horizons and features recognized in this pedon include an ochric epipedon in the zone from 0 to 4 inches (Oe & A horizon) and a cambic horizon in the zone from 4 to 27 inches (Bw horizons). The particle-size class of this series is described as coarse-loamy

**Wetland Soils**

No wetland soils identified within the 200 foot lease area or in the immediate vicinity of the project site.

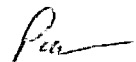
**SUMMARY/CONCLUSION**

Kleinfelder did not identify the presence of inland wetland or watercourses on the project site. Based on the current proposed tower development project reviewed coupled with the significant separation distance of the proposed development from the French River by Riverside Drive and other upland areas, there are no anticipated adverse impacts expected to offsite wetlands or watercourse resources. Utilizing appropriate soil erosion and sedimentation controls will reduce, if not eliminate, any risk of impact to offsite wetlands and watercourse resources.


**CLOSING**

Thank for the opportunity to work with you on this project. Please contact me at (860) 683-4200 if you have any questions or require additional assistance.

Very truly yours,  
**Kleinfelder East, Inc.**

 Date: 2007.10.26  
10:30:54 -04'00'

Paul Wheeler  
Project Wetland Scientist

 Date: 2007.10.26  
10:31:12 -04'00'

Jeffrey R. Shamas, CE, SS, PWS  
Natural Resources Program Manager

Attachments

## Photographs



Proposed tower location. Hill shown in photo will be removed for tower placement. View looking southwest



Rear of landscape business located at 347 Riverside Drive. View looking west

# Soil Map

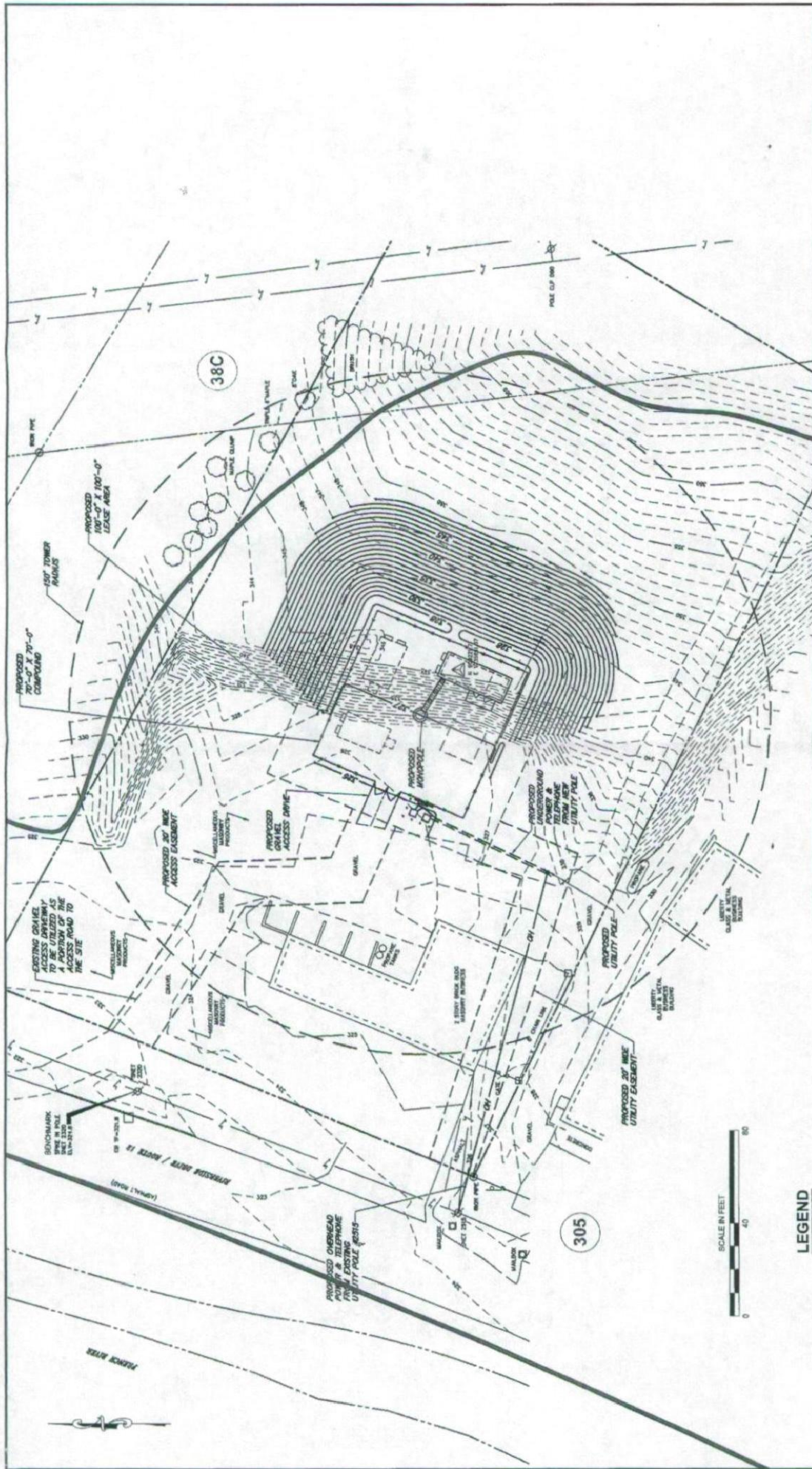


FIGURE: **1**

**KLEINFELDER**

99 LAMBERTON ROAD, SUITE 201  
 WINDSOR, CONNECTICUT  
 PH. (860) 663-4200 FAX. (860) 663-4206  
 www.kleinfelder.com

**SOIL CLASSIFICATION MAP**

PROJECT NO. 85630 FILE NAME: 98A.dwg

THOMPSON 98 A  
 347 RIVERSIDE DRIVE  
 NORTH GROSVENORDALE, CONNECTICUT

DRAWN BY: CTH

REVISED BY:

CHECKED BY:

DATE: 10/24/07 APPROVED BY:

- LEGEND**
- 305 UDORTHENTS-PITS COMPLEX, GRAVELLY
  - 38C HINCKELY GRAVELLY SANDY LOAM, 3-15% SLOPES



UDORTHENTS-PITS COMPLEX, GRAVELLY

HINCKELY GRAVELLY SANDY LOAM, 3-15% SLOPES

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September 18, 2007

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**RE: Wetland & Watercourse Delineation Report  
Thompson 98 B  
407 Riverside Drive  
North Grosvenordale (Thompson), Connecticut**

Dear Mr. Lusitani:

Kleinfelder East, Inc. (Kleinfelder) completed an on-site investigation to determine the presence or absence of wetlands and/or watercourses on the above referenced property (407 Riverside Drive, North Grosvenordale (Thompson), CT), as requested and authorized. This investigation involved a wetland/watercourse delineation that was completed by a qualified staff soil scientist and conducted in accordance with the principles and practices noted in the United States Department of Agriculture (USDA) Soil Survey Manual (1993). The soil classification system of the National Cooperative Soil Survey was used in this investigation to identify the soil map units present on the project site.

### **INVESTIGATION**

The project site was investigated on June 21, 2007, with a temperature in the 80s under partly cloudy conditions. Soil types are identified by observing soil morphology (soil texture, color, structure, etc.). To observe the morphology of the soils, numerous test pits and/or hand borings (generally to a depth of at least two feet) are completed. Wetland and watercourse boundaries were identified with flags and hung from vegetation. One wetland system was identified on site. This system was identified beneath and adjacent to the overhead electric right of way and marked with wetland flags numbered sequentially from 1 Start Open End to 13 Open End. These flags are labeled "Wetland Delineation" and generally spaced a maximum of about 50 feet apart, as well as numbered consecutively. It is important to note that flagged wetland and watercourse boundaries are subject to change until adopted by local, state, or federal regulatory agencies.

### **REGULATORY INFORMATION**

Wetlands and watercourses are regulated by both state and federal law each with different definitions and regulatory requirements. Accordingly, the State may regulate waters that fall outside of federal jurisdiction; however, where federal jurisdiction exists concurrent State jurisdiction is almost always present.

#### **State Regulation**

*Wetland* determinations are based on the presence of poorly drained, very poorly drained, alluvial, or floodplain soils and submerged land. *Watercourses* are defined as "rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs and all other bodies of water, natural or artificial, vernal or intermittent, public or private, which are contained within, flow through or border upon the state or any



portion thereof." *Intermittent watercourse* determinations are made based on the presence of a defined permanent channel and bank, and two of the following characteristics (1) evidence of scour or deposits of recent alluvium or detritus, (2) the presence of standing or flowing water for a duration longer than a particular storm incident, and (3) the presence of hydrophytic vegetation. (See Inland Wetlands and Watercourses Act §22a-38 CGS )

## WETLAND AND WATERCOURSE SITE DESCRIPTION

Wetland classifications used to identify the type of wetland(s) occurring on the project site are based on guidance from the U.S. Fish and Wildlife Service (USFWS) (Cowardin et al. 1979). These are further qualified with the Hydrogeomorphic Method of wetland classification (Brinson, 1993). Photographs of the wetland/watercourse and upland habitats are attached.

**TABLE 1:** Predominate Vegetation within and adjacent to the wetlands (Common (*Scientific*) names)

<b>Wetland Area (flags 1-13)</b>
<b>TREES &amp; SAPLINGS</b>
Green ash ( <i>Fraxinus pennsylvanica</i> )
Red maple ( <i>Acer rubrum</i> )
White pine ( <i>Pinus strobus</i> )
White oak ( <i>Quercus alba</i> )
Silver maple ( <i>Acer saccharinum</i> )
<b>SHRUBS</b>
Tartarian honeysuckle ( <i>Lonicera tartarica</i> )*
Multiflora rose ( <i>Rosa multiflora</i> )*
Winged euonymus ( <i>Euonymus alata</i> )*
<b>HERBS/VINES</b>
Poison ivy ( <i>Toxicodendron radicans</i> )
Sensitive fern ( <i>Onoclea sensibilis</i> )
Multiflora rose ( <i>Rosa multiflora</i> )*
Redtop ( <i>Agrostis gigantea</i> )
<b>HERBS/VINES cont</b>
Woodland strawberry ( <i>Fragaria vesca</i> )
Summer Grape ( <i>Vitis aestivalis</i> )
Skunk cabbage ( <i>Symplocarpus foetidus</i> )
Virginia creeper ( <i>Parthenocissus quinquefolia</i> )
Narrow leaf cattail ( <i>Typha angustifolia</i> )
Intermediate woodfern ( <i>Dryopteris intermedia</i> )

## Wetland Description

The on-site wetland that was delineated consisted of a palustrine forested - emergent wetland system (USFWS class: PFO1 and PEM1) that was delineated using sequentially numbered flags 1 through 13 with open ends on each end. This wetland area is situated along the utility right of way (ROW) and consists of a ponded area that is set along a large slope that runs the north-south length of the ROW. As indicated by its classification, this wetland is along and includes an area within a shallow pond system which is fed by surface drainage and possibly a stream that was located in the non-delineated portion off the property. The pond releases water to the south into the emergent system. The water then continues down the slope to the south and eventually through intermittent streams to the French River located to the south of the property across Route 12/Riverside Dr. The wetland consists of the immediate edges of the ponded area, as well as, the ponded area itself. It is most likely that along with the off-site source this

wetland is fed by groundwater when the water table is high. The ponded area consisted of approximately 12 inches of water across the within the delineated area, but appears to be deeper in other parts. The vegetation along the edges of the pond is very dense and consists of facultative and wetter species predominantly.

## **SOIL MAP TYPES**

A brief description of each soil map unit identified on the project site is presented below including information from the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soil descriptions. Further information on these and other soils, please refer to the internet site at <http://soils.usda.gov/technical/classification/osd/index.html>. The soil survey map and soil identification pages for the project site are attached.

### **Upland Soils**

#### **Hinckley (HkC and HkD) gravelly sandy loam – 3 to 15 percent slopes**

This soil type is excessively drained, with surface drainage runoff being very low. Hinckley soils are nearly level to very steep soils on terraces, outwash plains, deltas, kames, and eskers, and occur in glacial outwash parent material. The slope of the HkC soil map unit is 3-15 percent and HkD is 15-35 on the landscape.

#### **Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky**

**Charlton Soils** - The Charlton series consists of very deep, well drained loamy soils formed in till. They are nearly level to very steep soils on till plains and hills. Slope ranges from 0 to 50 percent. Saturated hydraulic conductivity is moderately high or high. The diagnostic horizons and features recognized in this pedon include an ochric epipedon in the zone from 0 to 4 inches (Oe & A horizon) and a cambic horizon in the zone from 4 to 27 inches (Bw horizons). The particle-size class of this series is described as coarse-loamy with sizes in the control section from 10 to 40 inches.

**Chatfield Soils** - The Chatfield series consists of moderately deep, well drained, and somewhat excessively drained soils formed in till. They are nearly level to very steep soils on glaciated plains, hills, and ridges. Slope ranges from 0 to 70 percent. Crystalline bedrock is at depths of 20 to 40 inches. Saturated hydraulic conductivity is moderately high to high in the mineral soil. The diagnostic horizons and features recognized in this pedon are an ochric epipedon in the zone from 1 to 8 inches (A and AB horizons) and a cambic horizon in the zone from 8 to 25 inches (Bw horizon). Below this horizon is a lithic contact with bedrock at 25 inches (R horizon).

### **Wetland Soils**

#### **Ridgebury, Leicester, and Whitman Soils, extremely stony (3)**

**Ridgebury Soils** – The Ridgebury series consists of very deep, somewhat poorly and poorly drained soils formed in till derived mainly from granite, gneiss and schist. They are commonly shallow to a densic contact. They are nearly level to gently sloping soils in low areas in uplands. Slope ranges from 0 to 15 percent. Saturated hydraulic conductivity ranges from moderately low to high in the solum and very low to moderately low in the substratum. The soils diagnostic horizons include an ochric epipedon (0 to 5 inches (A horizon)), aeric feature 100 percent of the zone from 5 to 9 inches (Bw1 horizon), and a cambic horizon (5 to 18 inches (Bw and Bg horizons)). Densic contact root limiting material begins at 18 inches (Cd). Endosaturation occurs within the zone from 9 to 18 inches and is saturated above the densic contact (Bw2 horizon).

**Leicester Soils** - The Leicester series consists of very deep, poorly drained loamy soils formed in friable till. They are nearly level or gently sloping soils in drainage ways and low-lying positions on hills. Slope ranges from 0 to 8 percent. Permeability is moderate or moderately rapid in the surface layer and subsoil

and moderate to rapid in the substratum. The horizons and features recognized in this pedon are an ochric epipedon in the zone from 1 to 7 inches (A horizon) and a cambic horizon in the zone from 7 to 23 inches (Bg and BC horizons). There is also an aquic moisture regime as indicated by chroma of 2 in Bg horizon but with chroma too high within 30 inches (chroma 3 in BC horizon) to qualify for Typic Endoaquepts. This series also contains an endoaquepts subgroup based on saturation to a depth of 200 cm from the mineral soil surface. There is an aeris great group based on matrix color and a chroma of 3 or more in one subhorizon between the Ap and 75 cm (BC horizon) and the particle-size class in control section ranges from 10 to 40 inches and is considered coarse loamy type of soil.

**Whitman Soils** – The Whitman series consists of very deep, very poorly drained soils formed in glacial till derived mainly from granite, gneiss, and schist. They are shallow to a densic contact. These soils are nearly level or gently sloping soils in depressions and drainageways on uplands. Permeability is moderate or moderately rapid in the solum and slow or very slow in the substratum. The diagnostic horizons and features in this pedon include an umbric epipedon in the zone from the soil surface to a depth of 10 inches (Ap horizon) and a cambic horizon in the zone from 10 to 18 inches (Bg horizon). This soil also has aquic conditions as evidenced by a chroma of 1 in the Bg horizon. A densic contact is also present with the root limiting layer beginning at 18 inches. Whitman soils are considered to have a shallow depth class because the depth to the densic contact is less than 20 inches (Cd1 is at 18 inches)

## REFERENCES

1. Brnson, M.M 1993. *A Hydrogeomorphic Classification for Wetlands* Tech. Rpt.WRP-DE-4, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.
2. Cowardin, L.M., V Carter, F.C. Golet, E.T. LaRoe 1979. *Classification of Wetland and Deepwater Habitats of the United States*. US Government Printing Office Washington D.C. GPO 024-010-00524-6. 103 pp.

## CLOSING

The proposed tower development project reviewed is not anticipated to cause an adverse impact on the delineated wetlands noted in this report. Utilizing appropriate soil erosion and sedimentation controls will reduce, if not eliminate any risk of impact to the wetlands during construction. The area between the compound and the wetlands is a significantly disturbed area due to the construction of the utility corridor and the construction of residential housing and secondary roads. At the closest point from the nearest wetland the proposed tower compound will be approximately 125 feet. Based upon the existing disturbed conditions of the project site, we do not expect any adverse impact to the adjacent wetlands/watercourses.

Thank for the opportunity to work with you on this project. Please contact me at (860) 683-4200 if you have any questions or require additional assistance.

407 Riverside Drive  
North Grosvenordale (Thompson), Connecticut

Kleinfelder

September 18, 2007

Very truly yours,  
**Kleinfelder East, Inc.**

A handwritten signature in black ink, appearing to read "Paul Wheeler".

Paul Wheeler  
Project Wetland Scientist

A handwritten signature in black ink, appearing to read "Jeffrey R. Shamas".

Jeffrey R. Shamas, CE, SS, PWS  
Natural Resources Program Manager

Attachments

## *Photographs*



*Proposed tower location within upland area approximately 50 feet from wetland/upland boundary*



*Wetland boundary within utility right of way – pink "WETLAND DELINEATION" flags can be seen in the foreground of the photo*



*Pond and emergent wetland area within flagged wetland area adjacent to utility right of way*