Sunwood Development Corporation
Sand and Gravel Mining
Special Permit

Hamden, Connecticut

King's Mark Environmental Review Team Report

King's Mark Resource Conservation and Development Area, Inc.

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Sand and Gravel Mining
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Environmental Review Team Report

Prepared by the
King's Mark Environmental Review Team

Of the

King's Mark Resource Conservation and Development Area, Inc.

For the

Mayor and
Planning and Zoning Commission
Hamden, Connecticut

September 2006

Report #339

Acknowledgments

This report is an outgrowth of a request from the Mayor of Hamden and the Hamden Planning and Zoning Commission to the Southwest Conservation District (SWCD) and the King's Mark Resource Conservation and Development Area (RC&D) Council for their consideration and approval. The request was approved and the measure reviewed by the King's Mark Environmental Review Team (ERT).

The King's Mark Environmental Review Team Coordinator, Elaine Sych, would like to thank and gratefully acknowledge the following Team members whose professionalism and expertise were invaluable to the completion of this report.

The field review took place on Thursday, July 12, 2006.

Karen Leonard Allen	Stormwater Permit Engineer DEP - Stormwater Section (860) 424-3267
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Randolph Steinen	Geologist UCONN (emeritus) DEP – State Geological &Natural History Survey (860) 487-0226
Kurt Walton	Transportation Planner DOT – Office of Intermodal Planning 860-594-2145

I would also like to thank Dan Kops, assistant town planner, Ross Greenstein, Hamden Planning and Zoning Commission, John Laudano, QVHD, Bob Wiedenmann, applicant, David Lord, soil scientist for the applicant, and Brett Dorman, engineer for the applicant, for their cooperation and assistance during this environmental review.

Prior to the review day, each Team member received a summary of the proposed project with location and soils maps. During the field review Team members were given plans and additional information. Some Team members conducted a plan review only and others made separate field trips. Following the review, reports from each Team member were submitted to the ERT coordinator for compilation and editing into this final report.

This report represents the Team's findings. It is not meant to compete with private consultants by providing site plans or detailed solutions to development problems. The Team does not recommend what final action should be taken on a proposed project - all final decisions rest with the town and landowner/applicant. This report identifies the existing resource base and evaluates its significance to the proposed use, and also suggests considerations that should be of concern to the town. The results of this Team action are oriented toward the development of better environmental quality and the long term economics of land use.

The King's Mark RC&D Executive Council hopes you will find this report of value and assistance in the review of this special permit application for sand and gravel mining.

If you require additional information please contact:

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Introduction

Introduction

The Mayor of Hamden and the Hamden Planning and Zoning Commission have requested Environmental Review Team (ERT) assistance in reviewing a special permit for a proposed sand and gravel excavation.

The site is located in northern Hamden, between Brooksvale Avenue and CT Route 10 (Whitney Avenue), near the Cheshire town line. The site is 40.4 acres in size. Both Jepp Brook and Willow Brook traverse the site, which also contains extensive wetlands. The entire area lies within an Aquifer Protection Zone and part of the site lies within a Special Flood Hazard Area.

The proposal calls for the removal of over 250,000 cubic yards of sand and gravel over a two (2) year period. There will be several temporary wetland crossings. Approximately 64 round trip truck trips are planned each day from the site. At the completion of the excavation operation the applicant will construct four (4) groundwater-fed ponds and conduct some wetland restoration work. There is no other planned development of the site at this time.

Objectives of the ERT Study

The town has requested the ERT to assist in review of this project because of the magnitude of the proposal in the removal of 250,000 cubic yards of material, the impacts and disturbances to wetlands and watercourses, and the creation of 4 new ponds. Specific concerns include impacts to site hydrology, water quality, aquatic habitat ecology, assessment of revegetation plans, soils significance, and traffic and access.

The ERT Process

Through the efforts of the Hamden Mayor and Planning and Zoning Commission this environmental review and report was prepared for the Town of Hamden.

This report provides an information base and a series of recommendations and guidelines which cover the topics requested by the town. Team members were able to review maps, plans and supporting documentation provided by the applicant.

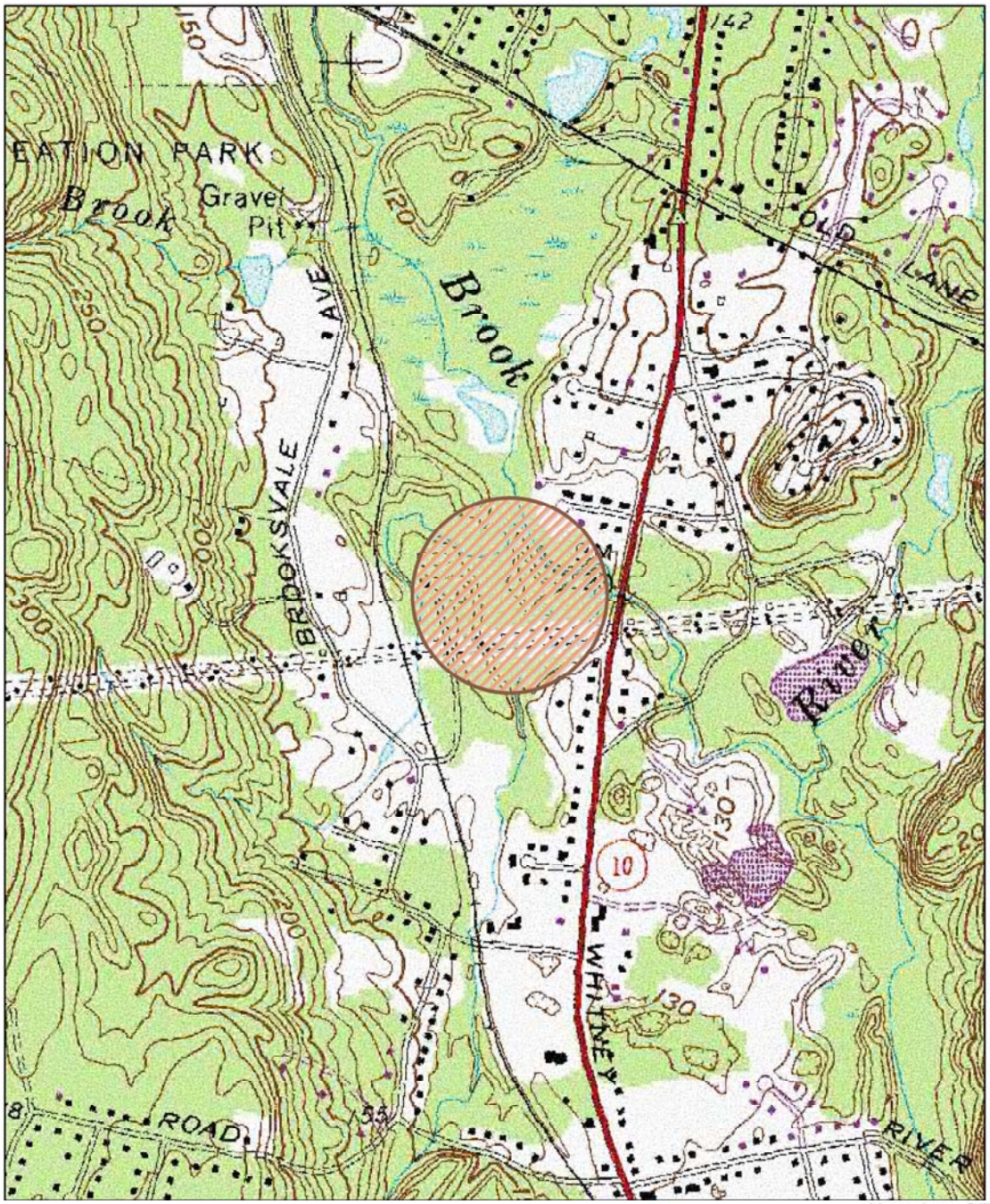
The review process consisted of four phases:

1. Inventory of the site's natural resources;
2. Assessment of these resources;
3. Identification of resource areas and review of plans; and
4. Presentation of education, management and land use guidelines.

The data collection phase involved both literature and field research. The field review was conducted Thursday, July 12, 2006. The emphasis of the field review was on the exchange of ideas, concerns and recommendations. Being on site allowed Team members to verify information and to identify other resources.

Once Team members had assimilated an adequate data base, they were able to analyze and interpret their findings. Individual Team members then prepared and submitted their reports to the ERT coordinator for compilation into this final ERT report.

ERT Project Location Map



The Connecticut Environmental Review Team

This map was prepared by Amanda Fargo-Johnson for the Connecticut Environmental Review Team. This map is for educational use only. It contains no authoritative data. July 2006.

Approx. Site Location

0 0.05 0.1 0.2 0.3 Miles

N

ERT Project Aerial Map

The Connecticut Environmental Review Team

This map was prepared by Amanda Fargo-Johnson for the Connecticut Environmental Review Team.
This map is for educational use only.
It contains no authoritative data.
July 2006.

Approx. Site Location

Hamden, CT

0 0.035 0.07 0.14 0.21 Miles

N

A Watershed Perspective

Opening Remarks

These recommendations to the Town of Hamden are given from the perspective of improving water quality and maintaining and supporting designated uses of the waters of the State in accordance with Connecticut's Water Quality Standards[1]. These recommendations also reflect the Department of Environmental Protection's (DEP) growing commitment to address water quality concerns from a watershed perspective, taking into account the cumulative impact of numerous activities within a given watershed that may affect water quality.

Watersheds are natural drainage divides that vary in size from drainage for backyard ponds to headwaters and tributaries of lakes and rivers. It is an easily identifiable landscape unit that ties together terrestrial, aquatic, geologic, and atmospheric processes. Land use planning at the watershed scale is an effective way to guide future development so as to minimize impact on both water quality and natural resources; direct available technical and financial resources to restoration and enhancement needs; facilitate partnerships to promote land and water resource stewardship; and develop actions to measure progress. Management decisions involving river resources must be made comprehensively and from an overall basin perspective. Integrated water use, water quality, land use data, and the instream biotic resource and habitat needs must be considered in river management decisions.[2]

As an additional consideration, choosing innovative approaches which minimize land disturbance and preserve natural buffers and open space not only minimize nonpoint source pollution and protect the environment, but also reduce infrastructure costs while affording neighborhoods opportunities to stay connected with their environment. In this new age of "Smart Growth", greenways, environmental equity, and better land use planning, it is incumbent upon all towns o consider and address all of the impacts associated with new development.

Proposed Project

The removal of over 250,000 cubic yards of sand and gravel over a two-year period from an area in excess of 15 acres will entail several temporary wetlands crossings and result in the creation of four ponds and ancillary wetlands restoration work. Due to the site's location within a FEMA 100-year flood zone (AE), special consideration must be given to the site's hydrology during and post-construction. And given the site's excellent

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[1] State of Connecticut, Department of Environmental Protection. Effective 1996 & 2002. Water Quality Standards. Bureau of Water Management – Planning and Standards Division. Hartford, CT.

[2] State of Connecticut, Office of Policy and Management. 2005. Conservation and Development Policies Plan for Connecticut 2005-2010. Intergovernmental Policy Division. Hartford, CT.

surface and ground water quality, it is extremely important that precautions and Best Management Practices (BMPs) be taken to protect the stream and groundwater.

General Site Description

The site is a sand and gravel deposit adjacent to Willow Brook just northwest of the confluence with Jepp Brook on the west side of Route 10 in Hamden. Soils present are either gravelly sandy loam or sandy loam. This area lies within the Willow Brook floodplain, in the Willow Brook subregional drainage basin (no. 5301), located in the South Central Western Regional Complex.

Water Quality Classification

The water quality classification for both Willow Brook and Jepp Brook is Class AA. The Class AA designated uses are: existing and proposed drinking water supplies; habitat for fish and other aquatic life and wildlife; recreation; and water supply for industry and agriculture.

The ground water classification for the area is Class GAA. Designated uses for Class GAA are: existing or potential public supply of water suitable for drinking without treatment; baseflow for hydraulically connected surface water bodies.

As a consequence of the surface and ground waters being extreme high quality, any proposed development merits further consideration of available, practical measures which can be taken to ensure the protection of these resources from development-related impacts and nonpoint source pollution - a growing nationwide concern.

Project Impact Summary

The proposed phased sand and gravel excavation will render four groundwater fed ponds of various sizes; a minor portion of restored wetlands; and in the course of construction, several temporary wetlands crossings. The proposed method of excavation will create large bowls which will help control sedimentation, but that will result in steep sided slopes for the future ponds which may pose a safety risk not only to potential recreationists, but also slumping and erosion under submerged conditions. While vegetative plantings and erosion controls are proposed to help stabilize the slopes, care should be taken that invasive plants don’t take hold or that nuisance geese don’t damage or denude the slopes of the proposed plantings. A narrow buffer of tall herbaceous vegetation or thicket forming shrubs along the ponds’ edges would discourage the geese, also aiding in the protection of the water quality from fecal fouling caused by the geese which is a real concern.

As a secondary impact from the proposed sand and gravel excavation, it is foreseeable that the proposed groundwater-fed ponds will deprive the adjacent streams (especially Jepp Brook) of base flow as a result of stymieing groundwater discharge during seasonal low flows. Once filled, the ponds may have less of an effect on hydrology but the quality

of the groundwater discharging to the stream may be adversely affected by its exposure in the pond to other factors affecting water quality such as thermal impacts and other sources of non-point source pollution, such as the geese. All the more reason for extra diligence in ensuring that the post-construction site is adequately stabilized and environmentally secured from future impacts.

Topography and Geology

This proposal calls for removal of more than 250,000 cubic yards of sand and gravel at the site and then reclaiming the land by creating permanent groundwater-fed ponds. The site consists of three rather steep-sided hills (Figures 1 & 2) surrounded by wetlands. Each hill consists of sand and gravel that was deposited on or against melting glacial ice at the end of the last Ice Age about 17,000 years ago (Flint, 1962). The hilltop elevations are between 138 and 146 feet (which appears to be relative to mean sea level) and the valley-bottom elevations are between 111-118 feet. In the valleys, the water table elevation is close to the valley bottom elevation (*i.e*. wetlands or flowing bodies of water are present in all the lowlands visited) and likely rises somewhat beneath each hill. The elevation of the bottom of the sand and gravel deposit is unknown. The developers plan to excavate to an elevation (which will be the pond-bottom elevation after reclamation) of 91 feet or 100 feet depending on the exact location.

The deposit consists of gravelly sand that is composed of a mixture of sand to cobble sized particles with little or no silt sized particles (Figure 3). A few boulders were seen on the ground surface where a small amount of sand and gravel was removed some years ago (Figure 4). Boulders should not be a problem. Most of the cobbles and boulders consist of soft sedimentary rock derived from the New Haven Arkose, which is the bedrock that underlies the area. Some basalt or diabase is present, as is a few metamorphic rock fragments. Because of their composition, the coarsest particles are too soft to produce a good aggregate when crushed and hence it is unlikely milling will take place on the site. There is very little silt in the deposit and it is unlikely that washing will be necessary. The only processing that may occur on site is screening.

This reviewer has some concerns about the data upon which the plan was drawn. The most serious deficiency in this reviewer's opinion is the lack of subsurface data, such as the elevation of the water table and depth of bedrock. Both will have implications on how much material can be removed during the excavation. The "deep excavation" will be made by a large back-hoe like machine that has a working depth dependant on the length of the excavation arm. If the excavation proceeds (as was presented to the ERT at the field visit) by first removing material to the depth of the water table and then removing deeper material from the surface so created, the lowest (deepest) elevation to which excavation can take place will be higher if the elevation of the water table is higher than expected. This will result is less material being excavated and less profit to the developer. He may then request to pump seepage-water out of the excavation pit so as to dig deeper.

A similar end-result would occur if the depth to bedrock is shallower than the planned excavation depth. Sand and gravel deposits are not unlimited in depth and bedrock will be encountered at some depth. The developers should have access to some information (such as depth of the well on their property and adjacent properties) that would tell them that adequate sand and gravel is present, but instead seem to take it on faith that bedrock is deeper than an elevation of 91 feet. If it is not, they will not be able to excavate as much material without enlarging the area of removal. That will translate into creating

larger ponds but less buffer between the newly created ponds and the established wetlands.

Fortunately, Mazzaferro (1973) provides relevant data from water-wells near the site that indicate the bedrock surface under the proposed gravel excavation site has an elevation of sea-level or lower (deeper). Haeni (1974) used Mazzaferro's data to provide a generalized regional map of the depth to bedrock.

References

Flint, R.F., 1962, The Surficial Geology of the Mount Carmel Quadrangle, CT Geol. and Nat. Hist Surv. Quad. Rpt. #12, 25p.

Haeni, F.P., 1974, Contour map of the bedrock surface, Mount Carmel Quadrangle. U.S. Geol. Surv. Map #MF-540A.

Mazzaferro, D.L., 1973, Hydrogeologic data for the Quinnipiac River Basin, Connecticut. CT Water Res. Bull. #26, 54p.

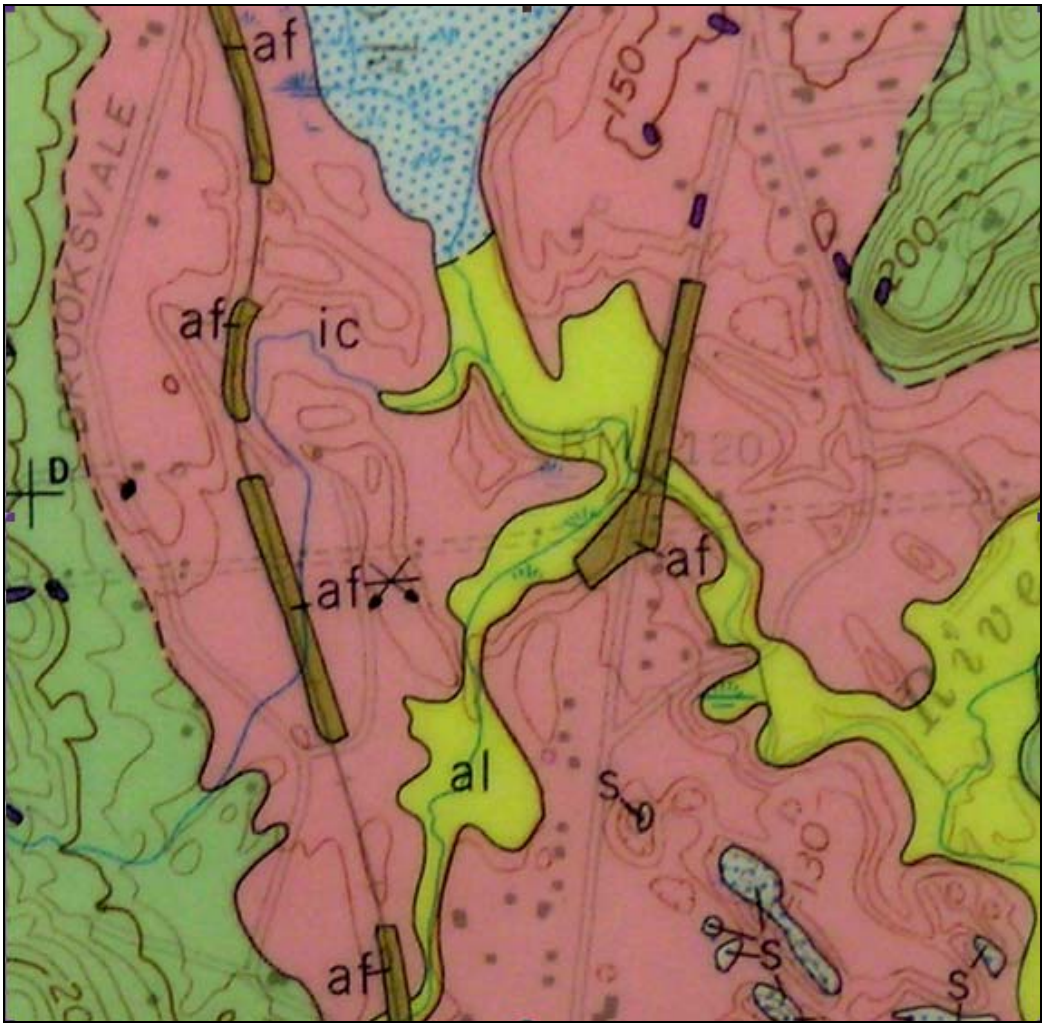


Figure 1. Geologic map of a portion of the Mount Carmel Quadrangle (Flint, 1962) showing the surficial materials in the area of proposed excavation. Width of map is approximately 4000 feet. Af = artificial fill, al = aluminum, s = swamp, ic = ice contact sand and gravel. The unlabeled area (green) on the west and northeast is glacial till covered bedrock. Small dark areas are bedrock exposed at the surface. Note particularly that bedrock sticks up through the sand and gravel just northeast of the site along the 150 foot contours and along the highway. This suggests that bedrock is fairly shallow in that region.

Figure 2. East side of Area A. Sand and gravel deposit consists of a long linear ridge with relatively steep sides, here approximately at the angle of repose. The sediment was deposited by meltwater streams flowing in channels on top of or under melting ice at the end of the last ice age. As such they were deposited against a wall of ice in a crevasse or perhaps a tunnel. When the crevasse or tunnel became filled the stream was diverted. Later the ice melted and the sand collapsed into a pile with slopes about 30°.

Figure 3. Ground surface near Area A. This is adjacent to small area that had previously been mined and this picture shows a slight slope. The deposit at this location is composed of 30-40% cobbles which may have been concentrated slightly by sand washing downhill during heavy rains. Grain-size analyses presented by the applicant typically show about 50% gravel and very little fine (silt) material. Most of the cobbles here are composed of Triassic sandstone which is relatively soft and does not make a good crushed aggregate.

Figure 4. Small area previously excavated near Area A. Note paucity of boulders. Two are seen, left behind, in this pit and only a few were seen elsewhere on the ground-surface. This suggests that there are not many boulders in the deposit.

Soils Resources

Soils within the parcel proposed for resource extraction have developed in glaciofluvial deposits commonly found on outwash plains, and include the Walpole sandy loam (13), Ellington silt loam (20A), Manchester gravelly sandy loam (37A and 37C) and Rippowam fine sandy loam (103) map units. Soil map unit boundaries are depicted on the following orthophotographic base map (Soil Survey of State of Connecticut, 4280 Whitney Avenue, July 18, 2006) available from the NCSS Web Soil Survey provided by the United States Department of Agriculture, Natural Resources Conservation Service. Also following are .a map unit legend summary and brief map unit descriptions obtained from the same internet source.

Soils of the Manchester map units, within which the majority of resource extraction is planned to take place, do provide high quality coarse soil materials for use in a variety of construction and engineering applications. Both the Walpole sandy loam and Rippowam fine sandy loam soils are classified as hydric and are considered inland wetlands in the State.

Concerns and Comments

The proposal under review envisions removal of approximately 250,000 cubic yards of material and, in doing so, creating four ponds with a combined surface area of approximately 4.8 acres. From a review of submitted documents, it appears that these ponds will range in size from 0.4 to 2.5 acres, and the depth of excavation to the pond bottoms will range from 35 to more than 45 feet below existing grade. Pond side slopes appear to be predominantly 2: 1 except where nearly level shelves are proposed.

Execution of this plan as proposed will likely result in the equilibration of groundwater levels throughout the parcel. Given the rapid permeability of the underlying outwash deposits and evaporation from the stagnant water surface, it is likely that there will be considerable water level drop during the hotter and drier season, potentially affecting water levels in remaining wetlands and in both Jepp and Willow Brooks. It should be noted that, while wetlands and riparian systems are repositories for groundwater for much of the year, during drier periods both may discharge groundwater to adjacent areas. Water table fluctuation can have substantial negative impact on wetland flora and fauna within the parcel and modify stream flow through the property and downstream.

The stability of all proposed 2:1 side slopes also appears to be problematic, given the tendency of banks excavated into on-site soils to slump and collapse. Manchester soils also have very low water-holding capacity and are of inherently low fertility; long-term

survival of tree and shrub species selected on soils with these physical and chemical properties is likely to be low, especially without supplemental irrigation during the period of establishment.

Proposed shallow marsh habitats within ponds B and D are planned to be approximately four feet below what is expected to be the surface water elevation. Should water levels equilibrate at the predicted levels, survivability of *Peltandra virginica* (Arrow Arum) and *Pontederia cordata* (Pickerelweed) is questionable given that both species can withstand flood depths of only eighteen inches or less for prolonged periods.

This reviewer is also skeptical that the planned addition of persistent open water and shallow marsh habitat, even if both are successfully established, will compensate for the removal of the great majority of upland wildlife habitat within the parcel.

Erosion and Sediment Controls

The majority of soil erosion and sediment controls proposed in this plan will help protect soil and water resources if they are constructed as designed, inspected as scheduled and maintained as required.

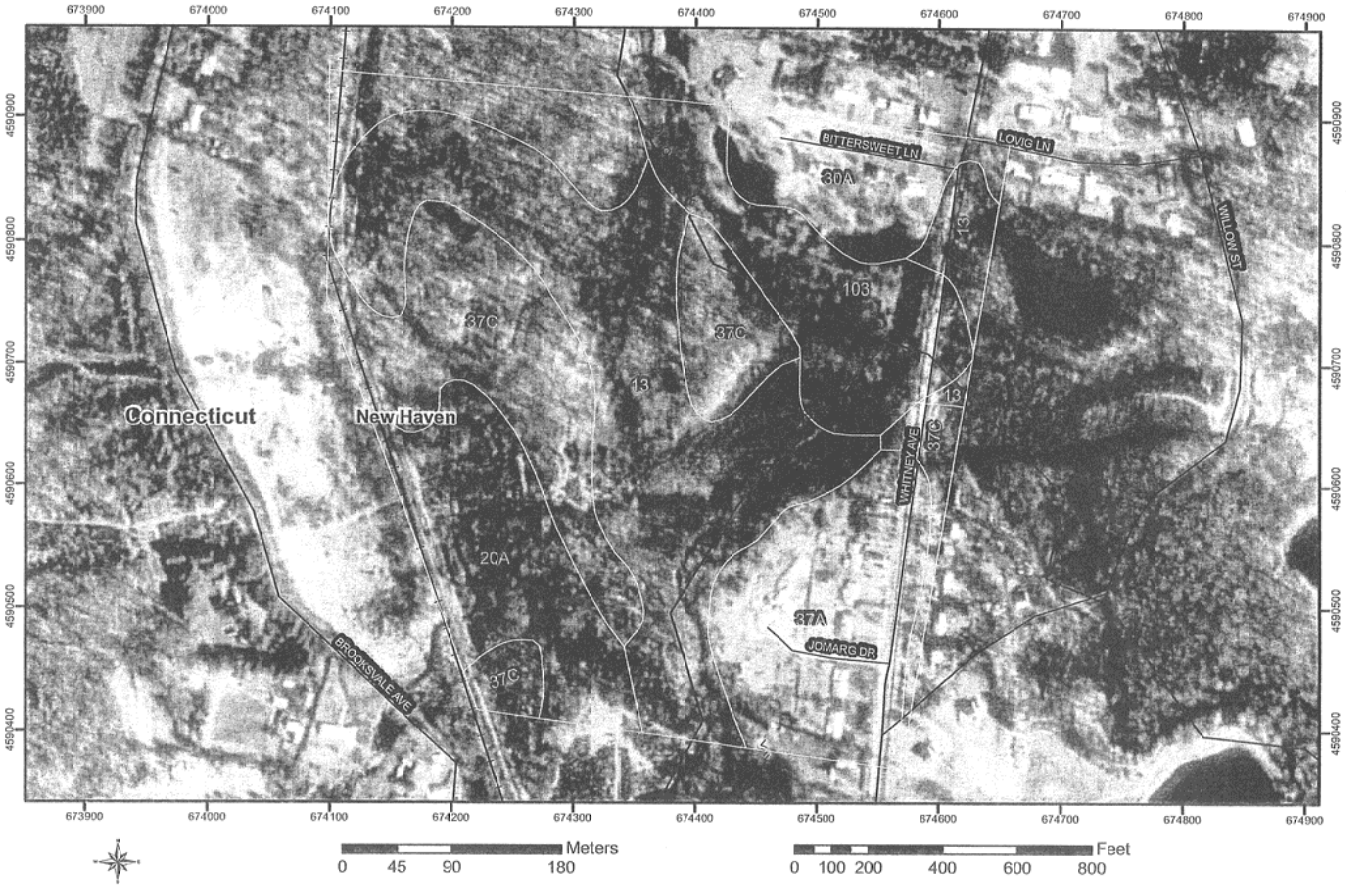
Concerns and Comments

Should the planned construction entrance fail to prevent the transport of soil material onto surrounding roadways, it is recommended that a washing station and associated temporary sediment basin be installed.

To the best of this reviewer's knowledge, the proposed refueling and maintenance area will be simply a "flat impervious surface area" as stated in the construction notes. Given the rapid permeability of on-site soils and the fact that the site is within a public water supply watershed, this reviewer does not believe that such is sufficient. This reviewer would recommend the addition of impervious curbing, a sump and a collection system for the proper containment of any inadvertent spills.

SOIL SURVEY OF STATE OF CONNECTICUT

4280 Whitney Avenue



4280 Whitney Avenue

MAP LEGEND

- Soil Map Units
- Cities
- Detailed Counties
- Detailed States
- Interstate Highways
- Roads
- Rails
- Water
- Hydrography
- Oceans
- Escarpment, bedrock
- Escarpment, non-bedrock
- Gulley
- Levee
- Slope
- Blowout
- Borrow Pit
- Clay Spot
- Depression, closed
- Eroded Spot
- Gravel Pit
- Gravelly Spot
- Gulley
- Lava Flow
- Landfill
- Marsh or Swamp
- Miscellaneous Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Slide or Slip
- Sinkhole
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Perennial Water
- Wet Spot

MAP INFORMATION

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov

Coordinate System: UTM Zone 18

Soil Survey Area: State of Connecticut
Spatial Version of Data: 3
Soil Map Compilation Scale: 1:12000

Map comprised of aerial images photographed on these dates:
4/3/1991

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

Map Unit Legend Summary

State of Connecticut

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
13	Walpole sandy loam	18.4	29.8
20A	Ellington silt loam, 0 to 5 percent slopes	7.2	11.7
30A	Branford silt loam, 0 to 3 percent slopes	4.4	7.1
37A	Manchester gravelly sandy loam, 0 to 3 percent slopes	8.5	13.8
37C	Manchester gravelly sandy loam, 3 to 15 percent slopes	16.2	26.3
103	Rippowam fine sandy loam	7.0	11.3

Map Unit Description (Brief)

State of Connecticut

[Only those map units that have entries for the selected non-technical description categories are included in this report]

Map Unit: 13 - Walpole sandy loam

Description Category: SOI

Walpole Sandy Loam
This map unit is in the Connecticut Valley Major Land Resource Area. The mean annual precipitation is 37 to 50 inches (940 to 1270 millimeters) and the average annual air temperature is 45 to 52 degrees F. (7 to 11 degrees C.) This map unit is 80 percent Walpole soils. 20 percent minor components.

Walpole soils
This component occurs on outwash plain terrace, depression, and drainageway landforms. The parent material consists of sandy and gravelly glaciofluvial deposits from gniess, granite, and schist. The slope ranges from 0 to 3 percent and the runoff class is very low. The depth to a restrictive feature is greater than 60 inches. The drainage class is poorly drained. The slowest permeability within 60 inches is about 1.98 in/hr (moderately rapid), with about 5.2 inches (moderate) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is about 6 inches. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 4w
Typical Profile:
0 to 1 inches; moderately decomposed plant material
1 to 7 inches; sandy loam
7 to 21 inches; sandy loam
21 to 25 inches; gravelly sandy loam
25 to 41 inches; stratified very gravelly coarse sand to loamy fine sand
41 to 65 inches; stratified very gravelly coarse sand to loamy fine sand

Map Unit: 20A - Ellington silt loam, 0 to 5 percent slopes

Description Category: SOI

Ellington Silt Loam, 0 To 5 Percent Slopes
This map unit is in the Connecticut Valley Major Land Resource Area. The mean annual precipitation is 35 to 50 inches (889 to 1270 millimeters) and the average annual air temperature is 45 to 52 degrees F. (7 to 11 degrees C.) This map unit is 80 percent Ellington soils. 20 percent minor components.

Ellington soils
This component occurs on valley and outwash plain terrace landforms. The parent material consists of eolian deposits over glaciofluvial deposits derived from basalt, sandstone, and shale. The slope ranges from 0 to 5 percent and the runoff class is very low. The depth to a restrictive feature is greater than 60 inches. The drainage class is moderately well drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 6.9 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is about 24 inches. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 2w
Typical Profile:
0 to 8 inches; silt loam
8 to 18 inches; silt loam
18 to 26 inches; very fine sandy loam
26 to 65 inches; stratified loamy fine sand to very gravelly coarse sand

Map Unit Description (Brief)

State of Connecticut

Map Unit: 30A - Branford silt loam, 0 to 3 percent slopes

Description Category: SOI

Branford Silt Loam, 0 To 3 Percent Slopes
This map unit is in the Connecticut Valley Major Land Resource Area. The mean annual precipitation is 38 to 50 inches (965 to 1270 millimeters) and the average annual air temperature is 45 to 52 degrees F. (7 to 11 degrees C.) This map unit is 80 percent Branford soils. 20 percent minor components.

Branford soils
This component occurs on valley and outwash plain terrace landforms. The parent material consists of eolian deposits over glaciofluvial deposits derived from basalt, sandstone and shale. The slope ranges from 0 to 3 percent and the runoff class is very low. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 6.3 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 1
Typical Profile:
0 to 8 inches; silt loam
8 to 18 inches; loam
18 to 24 inches; gravelly loam
24 to 65 inches; stratified very gravelly coarse sand to loamy fine sand

Map Unit: 37A - Manchester gravelly sandy loam, 0 to 3 percent slopes

Description Category: SOI

Manchester Gravelly Sandy Loam, 0 To 3 Percent Slopes
This map unit is in the Connecticut Valley Major Land Resource Area. The mean annual precipitation is 38 to 50 inches (965 to 1270 millimeters) and the average annual air temperature is 45 to 52 degrees F. (7 to 11 degrees C.) This map unit is 80 percent Manchester soils. 20 percent minor components.

Manchester soils
This component occurs on valley outwash plain, terrace, kame, and esker landforms. The parent material consists of sandy and gravelly glaciofluvial deposits derived from basalt, sandstone, and shale. The slope ranges from 0 to 3 percent and the runoff class is very low. The depth to a restrictive feature is greater than 60 inches. The drainage class is excessively drained. The slowest permeability within 60 inches is about 5.95 in/hr (rapid), with about 2.6 inches (low) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 3s
Typical Profile:
0 to 9 inches; gravelly sandy loam
9 to 18 inches; gravelly loamy sand
18 to 65 inches; stratified extremely gravelly coarse sand to very gravelly loamy sand

Map Unit Description (Brief)

State of Connecticut

Map Unit: 37C - Manchester gravelly sandy loam, 3 to 15 percent slopes

Description Category: SOI

Manchester Gravelly Sandy Loam, 3 To 15 Percent Slopes
This map unit is in the Connecticut Valley Major Land Resource Area. The mean annual precipitation is 38 to 50 inches (965 to 1270 millimeters) and the average annual air temperature is 45 to 52 degrees F. (7 to 11 degrees C.) This map unit is 80 percent Manchester soils. 20 percent minor components.

Manchester soils
This component occurs on valley outwash plain, terrace, kame, and esker landforms. The parent material consists of sandy and gravelly glaciofluvial deposits derived from basalt, sandstone, and shale. The slope ranges from 3 to 15 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is excessively drained. The slowest permeability within 60 inches is about 5.95 in/hr (rapid), with about 2.6 inches (low) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 4e
Typical Profile:
0 to 9 inches; gravelly sandy loam
9 to 18 inches; gravelly loamy sand
18 to 65 inches; stratified extremely gravelly coarse sand to very gravelly loamy sand

Map Unit: 103 - Rippowam fine sandy loam

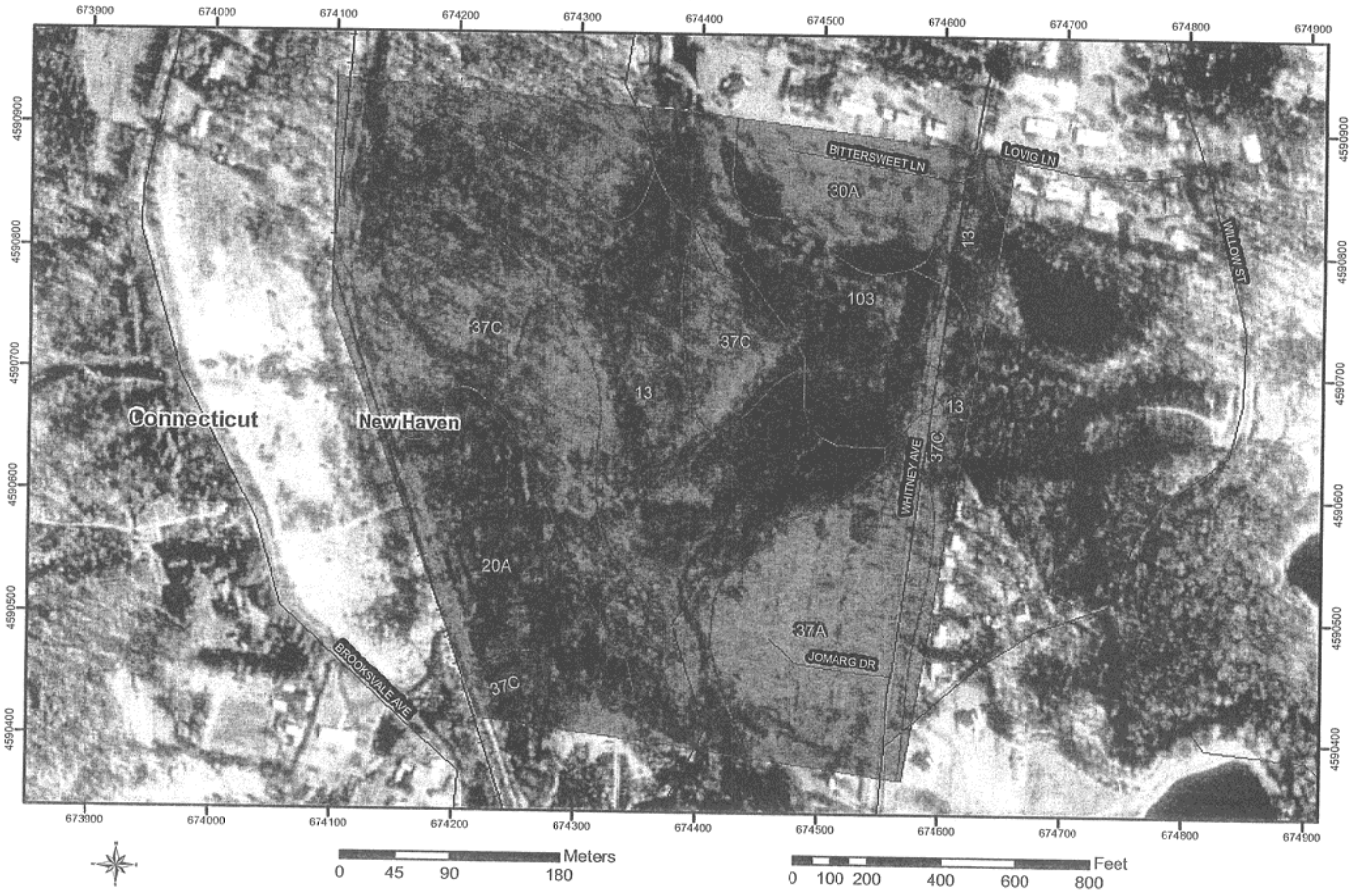
Description Category: SOI

Rippowam Fine Sandy Loam
This map unit is in the New England and Eastern New York Upland, Southern Part Connecticut Valley Major Land Resource Area. The mean annual precipitation is 35 to 50 inches (889 to 1270 millimeters) and the average annual air temperature is 45 to 54 degrees F. (7 to 12 degrees C.) This map unit is 80 percent Rippowam soils. 20 percent minor components.

Rippowam soils
This component occurs on depression and flood plain landforms. The parent material consists of alluvium. The slope ranges from 0 to 3 percent and the runoff class is very low. The depth to a restrictive feature is greater than 60 inches. The drainage class is poorly drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 6.2 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is frequent. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is about 9 inches. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 4w
Typical Profile:
0 to 5 inches; fine sandy loam
5 to 12 inches; fine sandy loam
12 to 19 inches; fine sandy loam
19 to 24 inches; sandy loam
24 to 27 inches; sandy loam
27 to 31 inches; loamy sand
31 to 65 inches; stratified very gravelly coarse sand to loamy fine sand

EXCAVATED PONDS (AQUIFER-FED) RATING FOR STATE OF CONNECTICUT

4280 Whitney Avenue



USDA Natural Resources Conservation Service

Web Soil Survey 1.1
National Cooperative Soil Survey

7/18/2006
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EXCAVATED PONDS (AQUIFER-FED) RATING FOR STATE OF CONNECTICUT

4280 Whitney Avenue

MAP LEGEND

Excavated Ponds (Aquifer-fed)

{Dominant Condition, >}

- Very limited
- Somewhat limited
- Not limited
- Not rated or not available
- Soil Map Units
- Cities
- Detailed Counties
- Detailed States
- Interstate Highways
- Roads
- Rails
- Water
- Hydrography
- Oceans

MAP INFORMATION

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov

Coordinate System: UTM Zone 18

Soil Survey Area: State of Connecticut
Spatial Version of Data: 3
Soil Map Compilation Scale: 1:12000

Map comprised of aerial images photographed on these dates:
4/3/1991

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

Tables - Excavated Ponds (Aquifer-fed)

Summary by Map Unit - State of Connecticut

Soil Survey Area Map Unit Symbol	Map Unit Name	Rating	Component Name (Percent)	Rating Reasons	Total Acres in AOI	Percent of AOI
13	Walpole sandy loam	Very limited	Walpole (80%)	Cutbanks cave	18.4	29.8
			Hinckley (5%)	Depth to water		
			Merrimac (5%)	Depth to water		
			Sudbury (3%)	Cutbanks cave		
				Depth to saturated zone		
			Scarboro (2%)	Cutbanks cave		
			Ninigret (2%)	Cutbanks cave		
				Depth to saturated zone		
			Raypol (2%)	Cutbanks cave		
20A	Ellington silt loam, 0 to 5 percent slopes	Very limited	Ellington (80%)	Cutbanks cave	7.2	11.7
				Depth to saturated zone		
			Branford (5%)	Depth to water		
			Raypol (5%)	Cutbanks cave		
30A	Branford silt loam, 0 to 3 percent slopes	Very limited	Branford (80%)	Depth to water	4.4	7.1
			Haven (5%)	Depth to water		
			Enfield (5%)	Depth to water		
			Ellington (5%)	Cutbanks cave		
				Depth to saturated zone		
			Manchester (3%)	Depth to water		
			Hartford (2%)	Depth to water		

Summary by Map Unit - State of Connecticut

Soil Survey Area Map Unit Symbol	Map Unit Name	Rating	Component Name (Percent)	Rating Reasons	Total Acres in AOI	Percent of AOI
37A	Manchester gravelly sandy loam, 0 to 3 percent slopes	Very limited	Manchester (80%)	Depth to water	8.5	13.8
			Hartford (5%)	Depth to water		
			Penwood (5%)	Depth to water		
			Branford (3%)	Depth to water		
			Ellington (3%)	Cutbanks cave		
				Depth to saturated zone		
37C	Manchester gravelly sandy loam, 3 to 15 percent slopes	Very limited	Manchester (80%)	Depth to water	16.2	26.3
			Penwood (5%)	Depth to water		
			Hartford (5%)	Depth to water		
			Branford (3%)	Depth to water		
			Ellington (3%)	Cutbanks cave		
				Depth to saturated zone		
103	Rippowam fine sandy loam	Very limited	Suncook (5%)	Depth to water	7.0	11.3
			Occum (5%)	Depth to water		
			Pootatuck (3%)	Cutbanks cave		
				Depth to saturated zone		
			Rippowam (3%)	Cutbanks cave		
			Lim (2%)	Cutbanks cave		
			Saco (2%)	Cutbanks cave		

Summary by Rating Value

Rating	Total Acres in AOI	Percent of AOI
Very limited	61.6	100.0

Description - Excavated Ponds (Aquifer-fed)

Excavated ponds (aquifer-fed) are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, Ksat of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Parameter Summary - Excavated Ponds (Aquifer-fed)

Aggregation Method: Dominant Condition

Component Percent Cutoff:

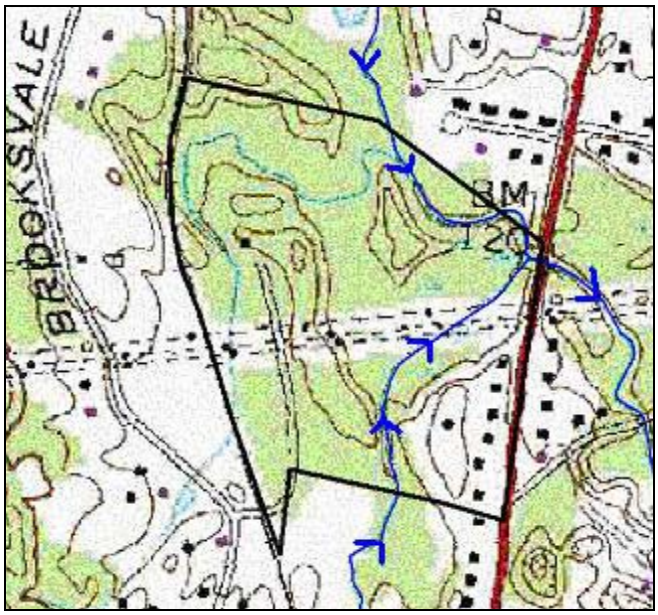
Tie-break Rule: Higher

Wetland Review

The site lies in the north central part of the town about one half mile south of the Hamden/ Cheshire border. Route 10 bounds the property to the east and the Farmington Canal Rail Trail borders it to the west.

A complete forested canopy covers nearly all the wetland and the upland sections of the entire 40+ acres except for the area of the power transmission line right-of-way (ROW). Three vigorous levels of vegetation are present across the site: herb, shrub, and tree, except in the ROW where the tree layer is absent. There were no indications of over browsing and very few invasive plants.

There was a light rain falling the day of the visit. Access to the property is by way of a cul-de-sac off of Route 10 in the southeast corner. At the time of the visit the Team had to cross Jepp Brook to advance north on the parcel. Crossing was done via step stones in the water.



The approximate property boundaries, along with the streams and the direction of flow, are depicted on this section of the 7.5 minute, USGS, Mount Carmel quadrangle. Jepp Brook can be seen flowing onto the parcel from the south. Willow Brook flows onto the parcel from the north, intercepts Jepp Brook and passes under Route 10 (heavy red line) flowing to the southeast. A lighter blue line represents a smaller unnamed tributary of Willow Brook that meanders roughly west to east into Willow Brook.

The proposal calls for the removal of 254,000 cubic yards of sand and gravel in five phases over 24 months. The work will begin in the furthest reaches of the parcel, to the north, and work back to the southeast entrance. A buffer of 100 feet is proposed on the west side between the canal trail and the excavation.

To gain access to the northern and eastern deposits three temporary wetland crossings will be constructed. The largest crossing will be across Jepp Brook using twin 60 inch diameter reinforced concrete pipes (rcp). The two other crossings will use single 54 inch rcp to cross the unnamed tributary to Willow Brook to the north and a 36 inch rcp to the east. As work retreats southward towards the entrance road the crossings will be removed. The crossing areas will be regraded, stabilized, and revegetated

Each of the streams enters the parcel at about 113 or 112 feet above sea level. Each of them then drops about 2 or 3 feet ultimately leaving the parcel at ~110 feet above MSL. The watercourses pass over the parcel snaking their way between the highpoints. It is those high points that will be taken away. Excavation will continue to below the groundwater surface. This will result in the creation of four wetland areas on site. In size these will be Area A - .81 acre, Area B – 3.6 acres, Area C - .8 acre and Area D – 1.4 acre. In total these will add 6.61 acres of open wetland to the site.

The site encompasses 40.4 acres. Wetlands and watercourses make up 15.5 acres of this total, leaving about 25 acres to be worked with (less when wetland setbacks are taken into consideration). The surface area to be disturbed which will result in new wetlands measures ~6.6 acres, or a little more that 25% of the total non-wetland surface. The top soil will be harvested from all areas to be disturbed and held on site awaiting reapplication upon reclamation of the excavated land. The surplus topsoil can be reapplied at ~33 percent greater than original topsoil depth because of the surplus.

Concerns

- Care will need to be taken to ensure that the coordinated wetland plantings mesh with the post construction pond level. There was some discussion and question of the final hydrogeology regarding the top of the water table, etc. Once those levels have been finalized, the planting plan can be finalized.
- Removal of and renovation to areas of road crossings. The greatest wetland impacts on the site will be at the watercourse crossings. These are areas of steep slopes and will be easily erodable once vegetation is removed. Large amounts of fill will be needed to bring the construction roads up to useable level. The fill will have to be entirely removed upon completion of work. Close inspection to erosion and sediment controls should be present throughout the project to ensure conditions incorporate best management practices to protect the watercourse ecology.

- Planting, fertilizing and mulching plans have been presented. As an important point, the applicant has also presented a vegetative success monitoring schedule of 30 days, six months and annually for five years. The Town of Hamden should closely follow the progress of success of the vegetative cover.
- Since excavation will proceed below the groundwater (GW) table, the question arose as to the location of the dewatering areas for the "dredged" materials. Once piled up, waters and fines will drain from these collection locations. Drainage must be away from existing watercourses as the fine particles could have negative impacts to the riverine ecology. However, if the dewatering areas for the materials excavated from below the GW level are on the 'benches', or marsh layer, of the newly constructed pond, then the fines will drain back into the sub-GW level excavation area.

These two aerial depictions show the (very) approximate boundaries of the parcel. The top photograph was taken in spring of 1934, the lower shot is April of 2003. Seventy two years ago the site was mostly open fields and was likely used for grazing.

In 2003, as it is today, the area was heavily wooded. The high land has been developed in the southeast portion of the outlined area. The entry can be seen as a cul-de-sac off of Route 10 two houses above the southeast corner. That cul-de-sac is the proposed main entrance for the excavation work.

Comments

- Construct trails in concert with rail trail. The Farmington Canal Rail Trail will continue to grow in significance as time goes on and more sections are added. Full advantage should be taken to tie in where possible to the trail connection. The Hamden recreation department will no doubt be glad to have input into this portion of the post excavation development. Indeed, if done well, there may be exceptional education opportunities regarding long term flora and fauna of the newly created wetland ponds
- Close off entry routes with large stones or other means to prohibit motorized vehicle entry and erosion. Due to the sandy nature of the soils and subsoil, erosion could be a long term challenge until the areas is stabilized through vegetative regrowth. Correct trail construction and roadblocks for travel into forbidden areas will help keep the area free from unwanted off road bicycle and motorized use.

- Post construction clean up of all litter from the site. There was some typical off-the-road-in-the-woods dumping and it should be eliminated as the site is restored to a post excavation park-like, aesthetically pleasing environment.
- The use of 2:1 slope on soils that are inherently sandy to create sidewalls for the proposed pond construction is a point of concern to various town commissions. This ratio would yield a 30% slope which may well be sufficient if the slopes can be rapidly stabilized to prevent erosion. The applicant's plans for vegetative matting to accomplish this end may need to be explained more effectively and the success of the practice described. It should be of note that in reducing the slope too much it becomes inviting for resident Canada geese. Considering that each goose excretes one pound of waste per animal per day, these small newly created ponds may well have water quality issues no one will want to have to tackle in the future.

Aquatic Habitats and Resources

Site Description

The 40.4-acre site (the "site") along Whitney Avenue, Hamden, proposed for sand and gravel excavation by the Sunwood Development Corporation is primarily forested intermixed with several wooded and/or shrub wetlands totaling approximately 15.5 acres. Jepp Brook *(Basin #: 5301)* flows south to north across the eastern portion of the site and Willow Brook *(Basin #: 5301)* flows easterly and delineates the site's northern property bound. Jepp Brook flows into Willow Brook immediately upstream of Whitney Avenue (Route 10) bridge. An unnamed, reportedly intermittent watercourse flows onto the site from the west and discharges into Willow Brook.

Aquatic Habitats

Both Jepp Brook and Willow Brook are perennial watercourses and are physically characteristic (respectively) of a coldwater and cool water stream found in Connecticut.

Jepp Brook transitions notably from a moderate gradient channel as it enters the site to a channel of low gradient closer to the Willow Brook confluence. Jepp Brook is contained in a channel approximately 12 to 15 feet in bankfull width. Normal flow depth in the farthest upstream reaches of the brook is 9 inches to 1 foot; normal flow depth in the in the further downstream sections is 2 to 3 feet. The brooks' substrate is composed of boulder, cobble, gravel, coarse sand, and sand-silt fines.

Willow Brook is contained in a channel approximately 20 to 25 feet in bankfull width. Normal flow depth is 2 to 3 feet. The brooks' substrate is composed of cobble, gravel, coarse sand, and sand-silt fines.

Dense growths of hardwoods and woody shrubs predominate as riparian vegetation along both Jepp Brook and Willow Brook. Physical in-stream habitat is provided by primarily by water depth, boulders, undercut banks and fallen or overhanging vegetation. The Department of Environmental Protection classifies both Jepp Brook and Willow Brook on the site as *Class AA* surface waters. Designated uses for surface water of this classification are potential drinking water supply, fish and wildlife habitat, recreational use, agricultural and industrial supply and other legitimate uses. Recreational uses may be restricted.

Aquatic Resources

The Inland Fisheries Division has conducted fish surveys of Jepp Brook and Willow Brook on or near the site. The fish surveys of Jepp Brook were conducted on July 11 and July 21 of this year; the sample area of the former date was near the Willow Brook confluence and that of the later date at the location of the proposed truck access road on the site. The fish surveys were through a 300-foot length of stream at both locations.

Despite dissimilar instream habitat, the fish population was similar at both locations and was composed of the following species – blacknose dace, fallfish and redfin pickerel.
Several fish surveys of Willow Brook have been conducted through the 1990's and most recently on July 11 of this year. The stream segments surveyed were either upstream or downstream of the Jepp Brook confluence. Each survey site was 300 feet in length. The fish population at each site was similar and was made up of the following species – brook trout, brown trout, blacknose dace, longnose dace, creek chub, fallfish, tessellated darter, redfin pickerel, white sucker, and American eel. The brook trout were native and the brown trout were present in three age classes; this indicates natural reproduction.

On one occurrence, fourspine sticklebacks were collected. This is normally a marine species however, freshwater populations are known to establish in low gradient streams. The Inland Fisheries Division has documented few freshwater populations to date including the Willow Brook population. All of the freshwater populations have been restricted to streams in south-central Connecticut.

Fish surveys of the unnamed stream have not been conducted. If reports of it being intermittent in flow are accurate, the stream is not likely to support a fish population.

Impacts

Sand and Gravel Excavation. Approximately 250,000 cubic yards of sand and gravel are proposed for excavation from five sub-areas of the site; the areas are referred to as Areas A-E. The excavation will involve a total of roughly 11 acres of the 40.4-acre site and will occur to within 50 feet of Jepp Brook, 75 feet along Willow Brook and 50 feet along the unnamed stream. The depth of excavation in Areas A-D will range from 25 to 45 below the existing ground and 1 to 25 feet below the surface water elevation in wetlands. Area A, adjacent to Jepp Brook, will be excavated to a depth 15 feet lower than the streambed. The depth of excavation will intercept groundwater and will result in the creation of ponds with surface areas from 0.4 to 2.5 acres and depths ranging from 5 to 25 feet. The ponds will not have outlets.

The proposed removal of sand and gravel from the site will significantly alter the existing topography of the area. It is conceivable that the removal of overburden as proposed may alter the local surface to groundwater hydrology. Of concern with the extraction to the depths proposed is the loss of soil types that have the ability to absorb a considerable percentage of precipitation falling on the site. Precipitation infiltrating the soil contributes to groundwater recharge, which is part of the local water table connected to wetlands and surface waters such as Jepp Brook and Willow Brook. The local water table provides seepage to the streams during dry periods and maintains a base flow essential to biological and habitat integrity. The amount of groundwater providing supply to the ponds will likely further diminish the amount contributed to the streams thereby exacerbating temporal or spatial impacts to surface flow.

Culvert Installation at Site Access Road. Despite setting the inverts of the twin culvert pipes below the grade of Jepp Brook, the stream segment flowing through the culverts will not provide habitat for a diverse community of aquatic species including fish. The two main factors precluding the development of viable aquatic habitat within the culvert are:

1. *Elimination of stream productivity*. The darkened conditions through the culvert will severely limit or prevent primary production (the growth of benthic algae) within the affected stream reach. A decrease or elimination of primary production in turn reduces the food supply available for aquatic insects and sequentially the amount of food available for resident fish in the relocated stream reach downstream of the culvert.

2. *Instability of streambed material*. Although the invert of the proposed box culvert is to be set below the elevation of the stream, it will be installed at a slope of 1.0%. At this slope, the smooth concrete surface of the culvert bottoms is unlikely to maintain a suitable layer of streambed material over time. The resulting long-term impacts are the loss of physical habitat and a barrier to upstream fish passage.

Recommendations

The following are recommended to eliminate the potential for impacts to both Jepp Brook and Willow Brook from the excavation of sand and gravel as currently proposed:

1. Increase the width of the unaltered riparian area along Jepp Brook and Willow Brook and the unnamed watercourse. The Inland Fisheries Division recommends that, at a minimum, a 100-foot wide riparian buffer be established along perennial watercourses and 50 feet along intermittent streams. Research indicates that vegetated riparian buffer zones of this minimum protective width prevent damage to aquatic ecosystems.

2. The depth to which the soil extraction is proposed should be evaluated by an individual(s) with groundwater expertise to determine changes to precipitation infiltration rates or water storage capacity of the remaining soils. The depth of the proposed soil extraction should be modified should adverse impacts to groundwater be predicted.

3. Redesign the site access road crossing of Jepp Brook. The Inland Fisheries Division routinely recommends the installation of span bridges or arch culverts for the crossing of perennial watercourses. These structures best preserve physical aquatic habitat and do not create barriers to fish migration.

Stormwater Review

The proposal is to remove 250,000 cubic yards of material in phases over a two-year period from a 40-acre property located at 4280 and 4246R Whitney Avenue in Hamden. The project is expected to disturb approximately 15 acres of land and ultimately create four, groundwater-fed ponds. No permanent development of the land is proposed following the excavation.

Stormwater Permitting – Construction

If the development activities to prepare the site for excavation (e.g. road building) will involve the disturbance of one or more acres regardless of phasing, the activity must comply with the requirements of Connecticut's *General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities* ("construction stormwater general permit"). A registration under the construction general permit is not required if the site development activities will result in the disturbance of between one and five acres regardless of phasing, and the project receives town review and written approval of the erosion and sediment control plan. If there is no town review or if the development activities will result in the disturbance of five or more acres of land regardless of phasing, then the developer must register under the construction general permit.

Stormwater Permitting – Industrial Activity

Mining operations are considered an industrial activity that requires registration under Connecticut's *General Permit for the Discharge of Stormwater Associated with Industrial Activity* ("industrial stormwater general permit"). In addition to the submittal of the registration, conditions of the industrial general permit include the preparation of a site-specific and certified Stormwater Pollution Prevention Plan and annual sampling if stormwater discharges from any detention or retention basin. The Stormwater Pollution Prevention Plan must address erosion and sediment controls, good housekeeping, vehicle and/or equipment washing, vehicle and/or equipment fueling, spill prevention and response procedures and inspection procedures.

Erosion and Sediment Control Notes

Review of the Grading Plan with Sediment and Erosion Control Notes (Plan) prepared by Conklin & Soroka, Inc., dated December 2002 and revised April 2006, resulted in the following comments:

- The proposed grading involves excavation to create a series of depressions, with stormwater runoff and stockpile dewatering directed into the depressions.

- Erosion and sediment controls shown on the plan are limited to a few areas of silt fence and hay bale barriers, and silt fence around stockpiles. The Plan must be modified to show the installation of silt fence along the temporary access road.

- The final grading plan uses long, 2:1 (horiz:vert) slopes. Whenever the vertical height of any slope steeper then 3:1 exceeds 15 feet, the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control require the installation of reverse slope benches that discharge to a stable outlet, or the use of engineered slope stabilization measures. The Plan must be modified to show how the applicant will meet this requirement.

- More detail must be provided as to the erosion and sediment controls that will be used during the installation of the temporary crossings. If dredging and/or dewatering is anticipated at any of the crossing locations, the Plan must describe how such waters will be handled to prevent the discharge of sediment into wetlands and watercourses.

- Erosion and sediment controls must be inspected at least once a week and within 24 hours of the end of a storm that is 0.5 inches of rainfall or greater. Note that the minimum rainfall event triggering inspection of controls drops to 0.1 inches of rainfall if the site requires coverage under the construction stormwater general permit. Sediment deposits must be removed when the sediment reaches approximately half the height of silt fence or other barrier.

- If possible, the fueling pad should be bermed <u>and</u> covered. At a minimum, the area surrounding the fueling pad should graded, or other measures installed, to prevent stormwater run-on.

- The applicant should contact the DEP Bureau of Water Protection and Land Reuse, Inland Water Resources Division regarding any permits needed for the installation of the temporary crossings.

The Natural Diversity Data Base

The Natural Diversity Data Base maps and files for the project site have been reviewed. According to our information, there are no known extant populations of Federal or State Endangered, Threatened or Special Concern Species at the site in question.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Environmental and Geographic Information Center's Geological and Natural History Survey and cooperating units of DEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the Data Base should not be substituted 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 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.

Archaeological and Historical Review

The project boundaries appear of moderate to high sensitivity for prehistoric and historic archaeological resources. The State Historic Preservation Office (SHPO) and the Office of State Archaeology (OSA) recommends that a reconnaissance survey be undertaken in order to provide the Hamden Planning and Zoning Commission with pertinent information regarding the identification and location of archaeologically sensitive areas within the proposed sand and gravel extraction location vis-à-vis the town and decision-making. All archaeological studies should be undertaken pursuant to SHPO's *Environmental Review Primer for Connecticut's Archaeological Resources*.

Of particular importance, all gravel mining activities must avoid physical impacts to the historic Farmington Canal, listed on the National Register of Historic Places, which is located in immediate proximity to the western border of the proposed project area.

SHPO and OSA look forward to providing further technical guidance to the Town of Hamden concerning the professional management of Connecticut's archaeological heritage.

Transportation Planner Comments

An encroachment Permit will be required to allow construction of the access road onto Route 10 (Whitney Ave).

The vehicles leaving the site drive are expected to operate at poor to failing levels of service and may pose a safety risk due to their size, weight and operational characteristics.

To alleviate these risks, proper signage and control of truck access should be utilized.

Therefore, the Department concurs with the following recommendations:

- The limiting of trucks to no more than eight, entering and leaving the site during an hour.

- The Adjustment of pavement markings on Whitney Ave to provide a twenty-foot width in the northbound direction in the vicinity of the site access road to provide a northbound by-pass around vehicles turning left onto the site.

- That the first fifty feet of the access road be paved and a tracking pad utilized to minimize the amount of material being tracked onto Whitney Ave.

- That a signing array warning motorists of entering trucks on Whitney Ave. be utilized.

- That trucks should be restricted from traveling to a destination south of the site during peak hours on Whitney Ave. and be allowed to travel in either direction during non-peak hours.

About the Team

The King's Mark Environmental Review Team (ERT) is a group of environmental professionals drawn together from a variety of federal, state and regional agencies. Specialists on the Team include geologists, biologists, soil scientists, foresters, climatologists and landscape architects, recreational specialists, engineers and planners. The ERT operates with state funding under the aegis of the King's Mark Resource Conservation and Development (RC&D) Area - an 83 town area serving western Connecticut.

As a public service activity, the Team is available to serve towns within the King's Mark RC&D Area - *free of charge.*

Purpose of the Environmental Review Team

The Environmental Review Team is available to assist towns in the review of sites proposed for major land use activities or natural resource inventories for critical areas. For example, the ERT has been involved in the review of a wide range of significant land use activities including subdivisions, sanitary landfills, commercial and industrial developments and recreation/open space projects.

Reviews are conducted in the interest of providing information and analysis that will assist towns and developers in environmentally sound decision making. This is done through identifying the natural resource base of the site and highlighting opportunities and limitations for the proposed land use.

Requesting an Environmental Review

Environmental reviews may be requested by the chief elected official of a municipality or the chairman of an administrative agency such as planning and zoning, conservation or inland wetlands. Environmental Review Request Forms are available at your local Conservation District and through the King's Mark ERT Coordinator. This request form must include a summary of the proposed project, a location map of the project site, written permission from the landowner / developer allowing the Team to enter the property for the purposes of a review and a statement identifying the specific areas of concern the Team members should investigate. When this request is reviewed by the local Conservation District and approved by the King's Mark RC&D Executive Council, the Team will undertake the review. At present, the ERT can undertake approximately two reviews per month depending on scheduling and Team member availability.

For additional information regarding the Environmental Review Team, please contact the King's Mark ERT Coordinator, Connecticut Environmental Review Team, P.O. Box 70, Haddam, CT 06438. The telephone number is 860-345-3977.