Ponde Place

Residential Apartment Community

Mansfield, Connecticut

Eastern Connecticut
Environmental Review Team Report

Eastern Connecticut
Resource Conservation and Development Area, Inc.

Ponde Place

Residential Apartment Community

Mansfield, Connecticut

Environmental Review Team Report

Prepared by the
Eastern Connecticut Environmental Review Team

Of the

Eastern Connecticut
Resource Conservation & Development Area, Inc.

For the

Planning and Zoning Commission
Mansfield, Connecticut

April 2009

Report #624

Acknowledgments

This report is an outgrowth of a request from the Mansfield Planning and Zoning Commission to the Eastern Connecticut Conservation District (ECCD) and the Eastern Connecticut Resource Conservation and Development Area (RC&D) Council for their consideration and approval. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

The Eastern Connecticut 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 December 15, 2008.

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I would also like to thank Gregory Padick, Mansfield Director of Planning, Rudy Favretti, chair, planning and zoning commission and inland wetlands agency, Tony Giorgio, Erik Williams, Lenny Montemerlo, Keystone Companies, Tom Fahey, Fahey & Landolina Attorneys LLC, David Ziaks, F. A. Hesketh & Associates, Ed Pawlak, CT Ecosystems, Susan Olmo, Corridor Property Management, Casey Fleming, CT DPH, Scott Gravatt, ECCD, and the many concerned citizens and neighbors 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 aerial photos and copies of the 2007 Master Plan. During the field reviews Team members received additional information, reports and maps. Following the reviews, 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. 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 Eastern Connecticut RC&D Executive Council hopes you will find this report of value and assistance in reviewing this proposed residential apartment community.

If you require additional information please contact:

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Table of Contents

Introduction

Introduction

The Mansfield Planning and Zoning Commission requested Environmental Review Team (ERT) assistance in reviewing a site proposed for residential apartment community that would cater to UCONN students, post-graduate candidates and junior faculty members..

The 45.93 acre site is located on Hunting Lodge Road, The project would require a zone modification to convert it from Rural Agricultural Resident-90 Zone (RAR-90) to a Design Multiple Residence Zone (DMR). Development for a housing project in the DMR Zone requires a special permit through the Mansfield Planning and Zoning Commission, along with other local permits and state approvals. It is bordered on the south by single family residences along Northwood Road, to the east by Hunting Lodge Road, to the north by the apartment buildings on Carriage House Drive, and to the west by undeveloped forest land. The site consists of a mixed hardwood forest and a total of 7.5 acres of wetlands.

In 2007 the developer (The Keystone Companies) submitted to the Mansfield IWA and P&Z commissions plans for a 648 resident multi-family housing project. The project consisted of three 3 story apartment buildings with 52 units and 18 townhouses with a total of 667 parking spaces provided. Two passive recreation spaces are shown on the 2007 plans. The application was withdrawn prior to public hearing due to expressed concerns by neighbors and the applicant's desire to revise and supplement application materials. Subsequently, the approval to tie into UCONN's water supply system was withdrawn by UCONN.

The applicant intends to submit new plans that will have community wells, but will still utilize the existing UCONN sanitary sewer system. On the master plan dated12/04/08, the main access is shown from Hunting Lodge Road with one additional emergency access road also from Hunting Lodge Road. There is no access from Northwood Road. Two wooden timber bridges are proposed to span the wetlands for the two roadways.

Objectives of the ERT Study

The town is seeking a professional, non-biased analysis of site characteristics and potential environmental, traffic and neighborhood impacts associated with a planned multi-family housing development. A study will benefit the town, the applicant and the neighboring property owners.

Concerns and areas of requested information include:

- Wetlands/watercourse – extensive wetlands, vernal pools, drains to N. Eagleville Brook

- Geology/hydrology – site is west of former UCONN landfill, site drains to N. Eagleville Brook, an impaired watercourse
- Topography/erosion and sediment control/stormwater drainage
- Water supply – community wells
- Land use, site design, open space – impacts to neighborhood, adjacent to UCONN forest land
- Traffic/access – access from Hunting Lodge Road, which already has significant traffic

The ERT Process

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

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

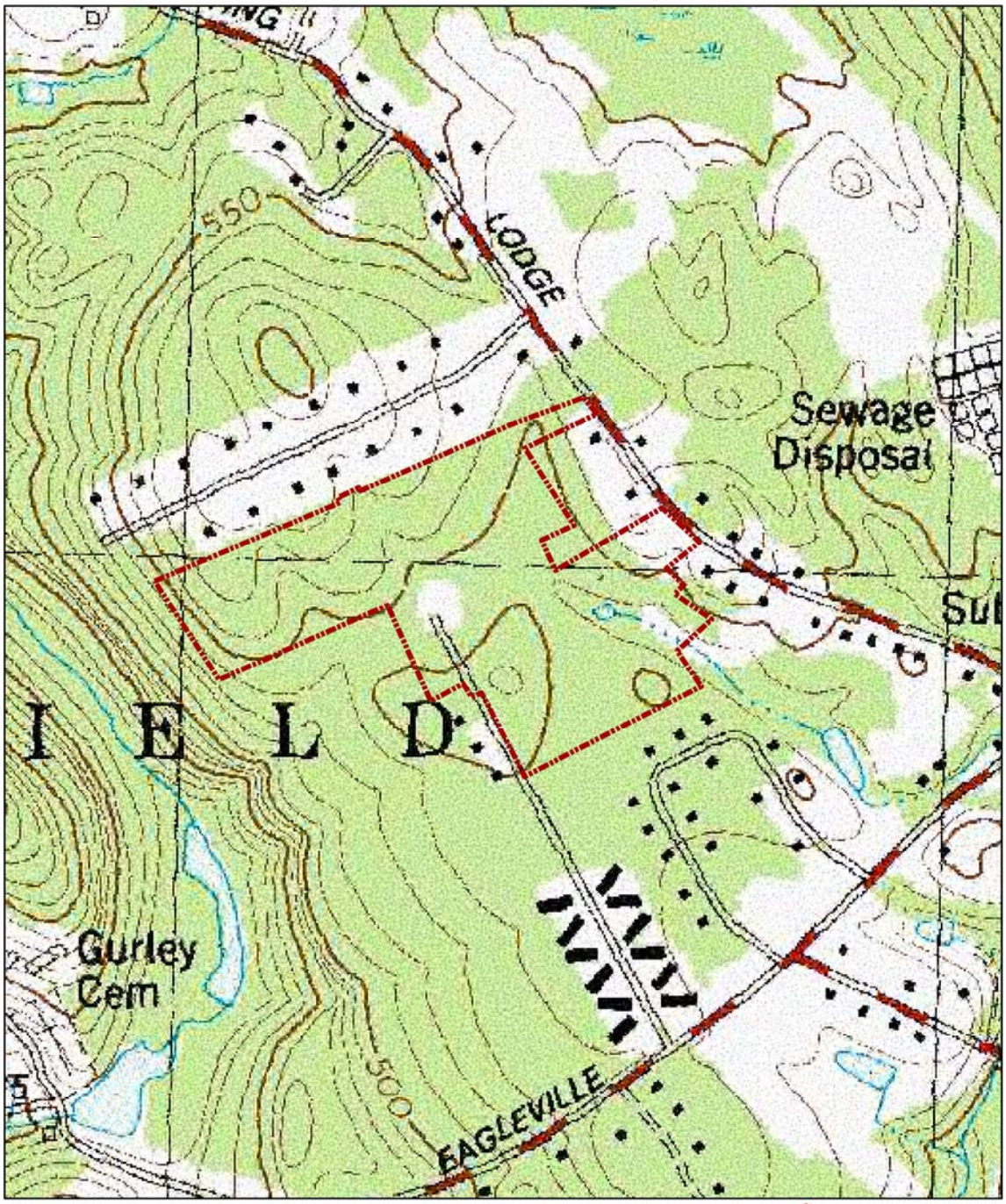
The review process consisted of four phases:

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 Monday, December 15, 2008. Team members also made individual or multiple field visits and requested additional information from the applicant. 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.

Ponde Place Site 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. April 2009.

0 0.05 0.1 0.2 Miles

Approximate Property Boundaries

Mansfield, CT

Ponde Place Aerial Map

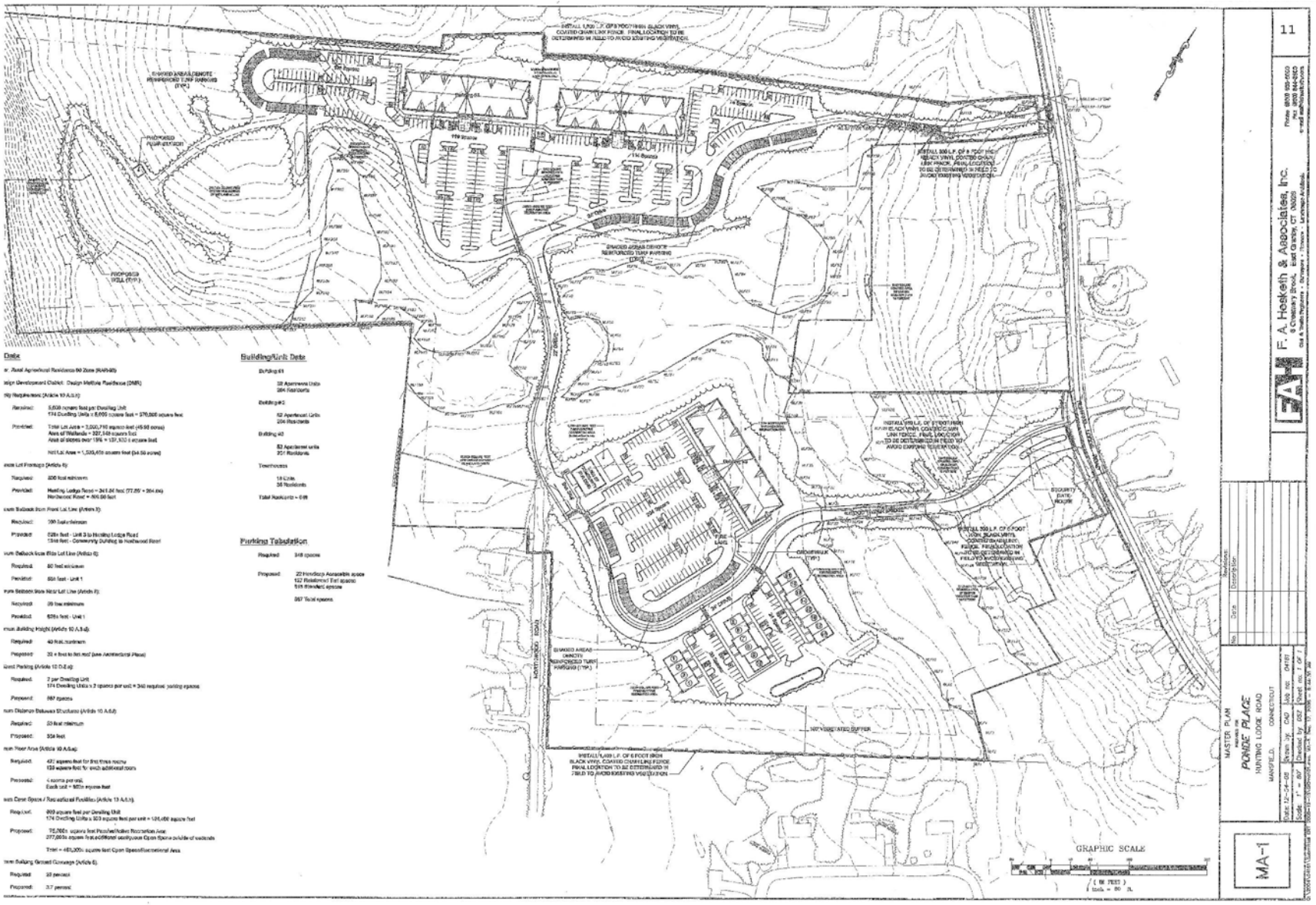
The Connecticut Environmental Review Team

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.
April 2009.

0 0.05 0.1 0.2 Miles

Approximate Property Boundaries

Mansfield, CT


Data
Building/Unit Data
Parking Tabulation
GRAPHIC SCALE
F. A. Hesketh & Associates, Inc.
MASTER PLAN
PONDE PLACE
HUNTING LODGE ROAD
MANSFIELD, CONNECTICUT
MA-1
11

Topography and Geology

The parcel upon which Ponde Place is proposed ranges in elevation from just under 540' to about 580'. Most of the slopes in the area are gentle (Fig. 1A) except along the westernmost border of the property where they are moderate (Fig. 1B). It sits near the top of a hill and straddles a drainage divide between two local streams in the Willimantic River watershed. The southwest facing slopes on the western part of the property drain into Cedar Swamp Brook; the eastern part of the parcel drains into Eagleville Brook. Topography should not hinder development of the property.


Figure 1A (left). Gentle slopes in middle portion of property. This view looks west from Northwoods Road near where it enters the parcel. 1B. (right). Moderate slopes along the western border of the parcel near the proposed well field. View looks southeast. Cedar Swamp Brook downhill to right.

Figure 2. Uneven topography of filled area. Note fill contains part of steel barrel and chunks of concrete. Broken concrete and clay pipes and brush were also noted.

The area has been disturbed by placement of fill in several areas. Notable is along the extension of Northwood Road where fill was placed for the road bed and fill was placed to the northeast of the road (Fig. 2) possibly in an attempt to use wet areas for home sites. The fill contains trash as well as soil material. A second area of fill placement created a wetland crossing from Hunting Lodge Road toward Northwood Road.

Bedrock (ledge) crops out along the north side of the ravine through which Cedar Swamp Brook flows (Figure 3). The outcrop is near the property boundary and may be on the property (this could not be determined during the site visit). Ledge consists of northeasterly-dipping biotite and calc-silicate gneiss (Figure 3) that is assigned to the Hebron Gneiss formation (Fig. 4). Where exposed the gneiss contains abundant foliation plane (layering) fractures as well as high-angle joints (fractures). Its only importance to this site is that it may be the aquifer into which the well field will attempt to provide water for the residents. If it is too close to the surface the ledge may need to blasted rather than ripped by an excavator in order to construct basements.

Figure 3. Left: Moderate slopes along western boundary of parcel with scattered outcrops of biotite gneiss and calc-silicate gneiss. Right: Detail of calc-silicate gneiss showing foliation plane fractures and sparse high angle fractures.

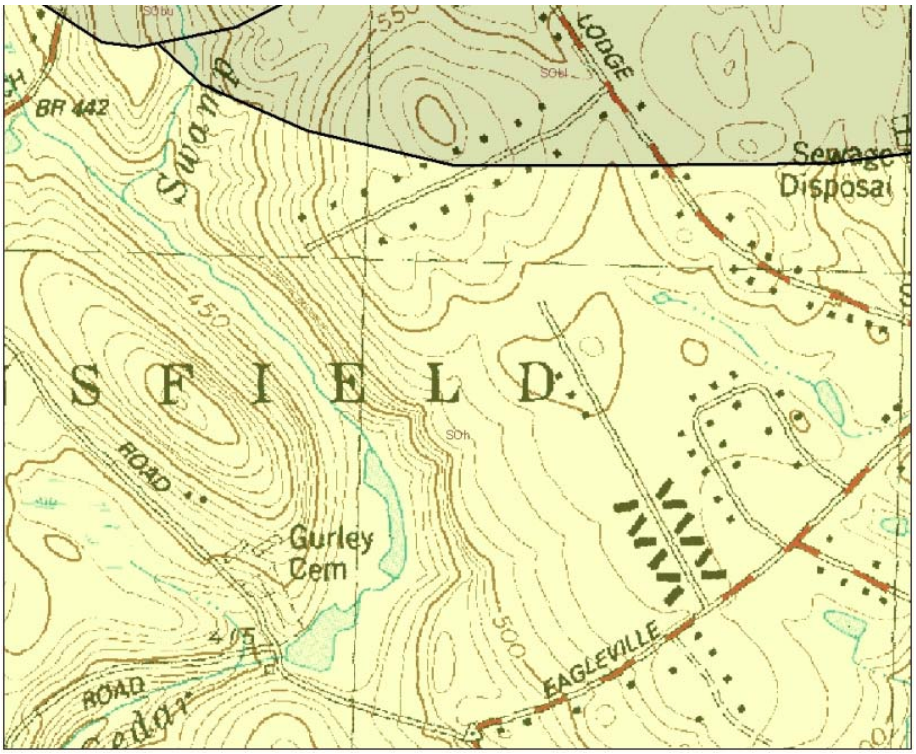


Figure 4

The northeastern corner of the parcel is underlain by rocks of the Brimfield Schist (Figure 4), a sulfide bearing, rusty weathering formation. It is unlikely that these rocks

will be encountered during construction. If however, they are encountered they should not be used for back-fill. The sulfide minerals will weather when exposed to rain water, producing rust and sulfuric acid that could leach into the wetlands.

Although surficial deposits covering the bedrock consists of till on the immediate parcel (see Fig. 5), the hills are not considered drumlins by Stone et al, 2005). A small

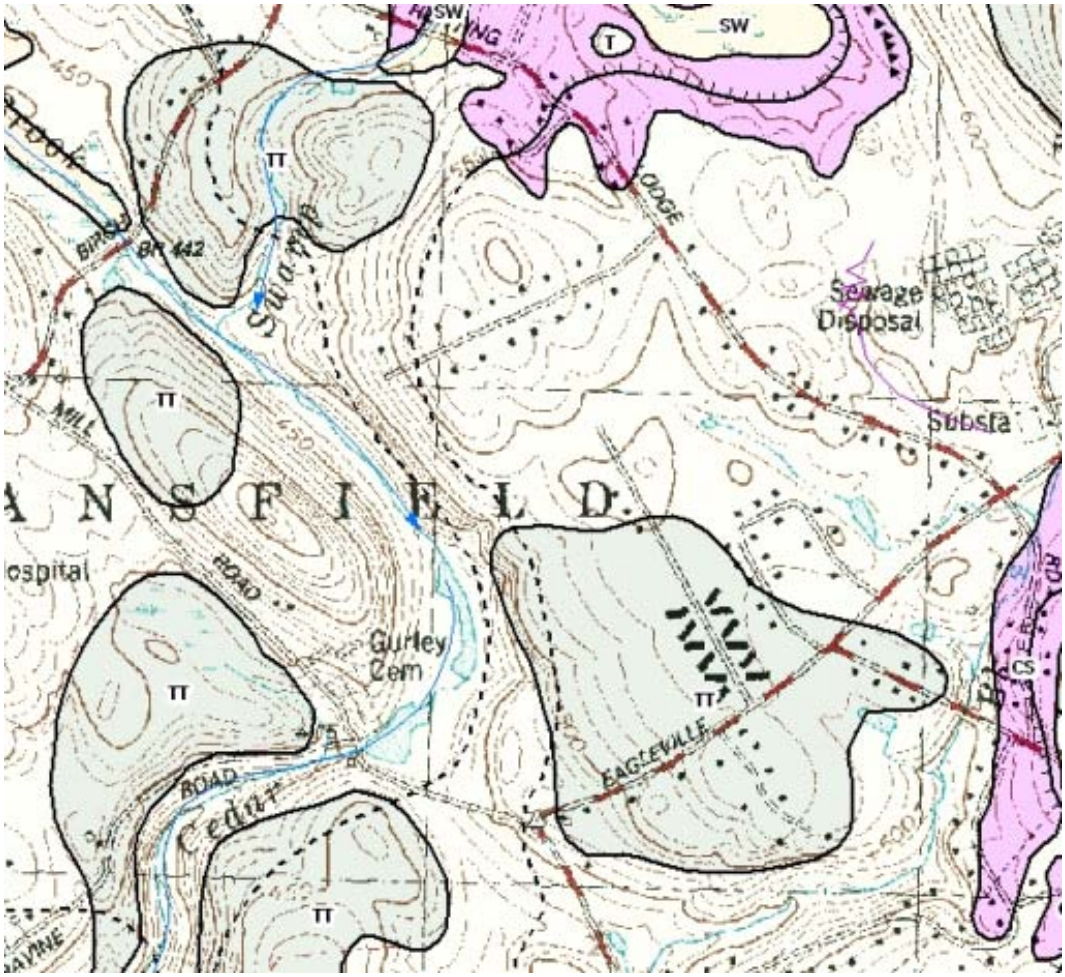


Figure 5. Surficial geologic map of area surrounding Ponde Place parcel. Notice that areas of thick till (TT) and areas of sand and gravel (CS colored magenta on the map) surround the parcel, but the parcel itself is covered by thin till (T). (After Stone et al, 2005).

ephemeral spring discharges water into a wetland at the northeastern corner of the parcel (Figure 6). The spring appears to be issuing from beneath fill placed during landscaping for the small house associated with Carriage House Apartments. It is likely that the spring dries up in the summer.

Figure 6 Ephemeral spring.

References

Rodgers, John, 1985, Bedrock Geological Map of Connecticut. State Geological and Natural History Survey of Connecticut, Nat'l. Resource Atlas Series, 1:125,000, 2 sheets.

Stone, J.R., Schafer, J.P., London, E.H., DiGiacomo-Cohen, M.L., Lewis, R.S., and Thompson, W.B., 2005, Quaternary Geologic Map of Connecticut and Long Island Sound Basin (1:125,000). U.S. Geol. Surv. Sci. Invest. Map # 2784.

Conservation District Review

Introduction

This proposal is for the construction on a 174 unit housing project for 648 residents within the vicinity of the University of Connecticut main campus. The parcel size is 45.93 acres. The project would require a zone modification to convert it from Rural Agricultural Resident-90 Zone (RAR-90) to a Design Multiple Residence Zone (DMR). Development for a housing project in the DMR Zone requires a special permit through the Mansfield Planning and Zoning Commission, along with other local permits and state approvals.

Issues that have been identified include concerns with traffic, environmental impacts, including construction within an impaired watershed and the presence of vernal pools, development of an on-site water supply, proximity of a closed landfill and other neighborhood issues including noise and lighting.

The site will be served by UCONN sewer system, with proposed upgrades. Drinking water is proposed to be supplied by development of an on-site community well system although water for emergency purposes, will be provided by UCONN public water supply.

Access, both primary and emergency, to the site is proposed off of the frontage of Hunting Lodge Road. Both accesses will require wetland crossings. The status of using other road connections adjacent to the site is unclear.

The proposal represents a fairly intensive development compared to what underlying zoning would likely permit. While building coverage is indicated to be 3.7 percent of the site parking and access roads contribute much more impervious surface.

Documents that were available to the ERT for review as part of this project include:

1. ERT Review Packet with cover memo dated November 25, 2008
2. Site plan entitled, Ponde Place, Hunting Lodge Road, Mansfield, Connecticut, Inland and Watercourse Application, ERT Review Set, prepared by F. A. Hesketh & Associates, Inc., dated December 15, 2008.
3. Wetlands Report, Ponde Place, Mansfield Connecticut, prepared by Connecticut Ecosystems, LLC, dated July 5, 2007
4. Engineering Design and Drainage Report, Ponde Place, Mansfield, CT, prepared by F. A. Hesketh & Associates, Inc., dated June 27, 2007

The review conducted by the Eastern Connecticut Conservation District (ECCD) focuses on wetlands impacts, stormwater impacts and soil resources and associated recommendations.

Site Description

The parcel proposed for the development is 45.93 acres, with two frontage points on a town road. It lies adjacent to two other housing projects, one to the north and the other to the southwest. The site is mostly wooded with mixed hardwood deciduous species. There are signs of previous disturbance on the property, including old roadways and an existing filled wetland crossing. Topography is fairly gently sloping in the eastern part of the site with some moderate to steep slopes along western border of the property.

Wetlands Resources and Impacts

Wetlands have been delineated on the property by a soil scientist and are shown on the plan. Further, an environmental review of the wetlands was conducted which describes each wetland, including their functions. Two vernal pools, based on presence of breeding amphibian egg masses, have been identified and noted on the plans. One of the vernal pools is located just north of the existing wetland crossing and was likely created as a result of dammed water. The second vernal pool is located just west of the access path which extends from the southern portion of the site to the north.

The parcel is spilt into two separate sub-watersheds, with the breaking point at the north-south access road. The wetlands and associated uplands parallel to Hunting Lodge Road are part of a tributary to Eagleville Brook, while the western portion of the parcel drains to Cedar Swamp Brook. Both watersheds ultimately drain to the Willimantic River.

According to DEP mapping, water quality for both Cedar Swamp Brook and Eagleville Brook are rated as B/A or B/AA, stating that the natural water quality may be threatened.

Eagleville Brook has been listed as an impaired watercourse on the 303d List of Impaired Waterways. It is impaired because it has been determined by the Connecticut Department of Environmental Protection that it does not support the desired aquatic life based on biological monitoring. Non-point source pollution, in combination with physical impacts, as a result of stormwater flows, has been determined to be the probable cause of the impairment. Management strategies that concentrate on reducing impervious surfaces in this watershed have been recommended.

As proposed, regulated inland wetland activities with the proposal would include, construction of two timber bridges and associated clearing in inland wetlands, discharge of stormwater from site development to inland wetlands from parking lots, driveways and rooftops, and work within regulated setbacks including clearing, site disturbance, building and utility construction. For the purposes of this report, stormwater will be covered in the next section and by other team participants.

Two wetland crossings are proposed for access to the site off of Hunting Lodge Road. One access would be the main entrance and the second would be for emergency vehicles.

It is likely, due to the wetland/upland layout of the land, that however or whenever the site is ultimately developed, a crossing of some sort would be requested.
Planked bridges are proposed for both crossings. Bridges have the benefit of minimizing fill or direct footprint into wetlands and continuing to maintain existing water flow conditions and wildlife passage. Additionally the primary access will utilize an existing crossing area that has been previously filled. Both crossings however, are fairly lengthy, the main access being approximately 200 feet and the emergency access being approximately 110 feet through wetlands. Both will also require additional clearing on the order of an average of 65-70 feet in width. The construction of two crossings on the same system also results in further division of a wetland corridor. The reviewing ecologist has also reported that it is likely that vernal pool species, although no threatened species were noted, will decline somewhat, due to the crossing. This is a realistic prediction, based on the proposal.

Other regulated activities are associated with clearing and construction adjacent to inland wetlands. With the layout of this site, almost any type of development would require work within regulated setbacks, both within inland wetlands and adjacent buffer areas. However, the intensity of this proposal is such that areas not being developed on the site are limited mainly to wetlands, and some adjacent upland areas.

Recommendations

- A comparison of anticipated wetlands impacts with current zoning development verses proposed zoning would assist in determining range of wetlands impact.
- If timber bridges are used, then specific maintenance criteria, such as continued preservative treatments, should be detailed.
- Additional details, including construction methodology, dewatering and sequencing should be included with any submittal for permitting of wetland crossings.
- To avoid two wetland crossings, emergency access should be sought via another avenue, such as a nearby development.
- Opportunities to enhance or restore any degraded wetlands, especially to create more viable vernal pool habitat, should be explored as potential mitigation.
- Opportunities to enhance wetland buffer areas to increase habitat resources with native species should be reviewed.
- See further recommendations under two following sections.

Stormwater Impacts

The primary stormwater impacts from development are usually related to stormwater discharge from impervious surfaces. Impervious surfaces with this project are associated with buildings, access roads and parking. Other stormwater impacts arise from surface flows directed over landscaped areas, which can be a concern if fertilizers or herbicides are used.

With this development, 174 dwelling units are proposed. According to the regulations, 348 parking spots are required for this density, however 667 spots are being provided. According to information received at the ERT meeting approximately 100 of those spots, the ones shown as reinforced turf parking, may be built at a later stage once a need has been determined.

In an effort to maintain several discharge points, a total of 8 stormwater outlets are being proposed which allows post development drainage conditions to be closer to pre-development.

As proposed the development has employed several methods to treat stormwater. Stormwater from roof tops will be directed to StormTech infiltration systems, with overflows to biofilters before outletting to inland wetlands. Parking lot drainage will be treated several ways. About 100 spaces are targeted for pervious treatment, promoting infiltration and dispersed sheet flow. Other parking in the townhouse section appears to be directed to a rain garden, with overflow to a biofilter outlet, and the remainder of the parking will be directed to catchbasins, then to an underground storage system, then to biofilters, prior to discharge. Finally, limited areas will not have any curbing to promote sheet flow conditions. The Wetlands and Drainage Reports both indicated that hydrodynamic separators would be used on site, however they do not appear on the plan.

While there are several methods proposed that embrace the Low Impact Development (LID) approach to stormwater management, there appear to be other opportunities to increase infiltration, thereby reducing impacts. These could include using parking islands as sunken treatment areas, increasing pervious parking surfaces by using an all-weather surface such as pervious pavement, and green rooftops, among others.

The detail page was not included with the plan sheet set, so it is not possible to verify specific design criteria. Additionally it does not appear that all the surfaces would have the benefit of treatment, as there are some areas, for example the bridges that would discharge directly to wetlands. This becomes a concern for instance when deposited substances such as deicing materials like salt and sand are applied to roadways. Temperature spikes from summer rains can also be an issue.

The standard criteria currently being used, is to treat for removal of 80% total suspended solids (TSS). This is typically accomplished by sizing stormwater treatment measures to treat the Water Quality Volume (WQV) or the amount of water generated by one inch or rainfall from the drainage area. The first inch of stormwater runoff is generally associated with the majority of pollutants. The basins proposed for this development are sized using these calculations. Documentation, that the stormwater treatment methods proposed on the site will meet the criteria, has not been included.

The primary concern with this proposal, to change the zone to allow more intense development, appears to be in direct contradiction to recommendations to limit impervious surfaces in this watershed.

Recommendations

- If the town wishes to amend the zone, to provide for multiunit housing, then the proposed density, which translates into additional impervious surfaces, should be reviewed in light of recommendations to minimize impervious surfaces in this watershed.
- With any proposed development, the town should require detailed stormwater maintenance instructions for any treatment methods proposed and identify how the town will be assured that they will be implemented.
- With any proposed development, verify that all stormwater will be treated to remove pollutants to meet recommended standards.
- The recommended depth to groundwater table for any proposed infiltration stormwater treatment method should be verified. Test pits or monitoring may be required to determine the groundwater levels.
- If underdrains or footing drains are necessary, they should be incorporated into the plans for review.
- Consider additional LID methods such as; using islands as sunken treatment areas, increasing pervious parking surfaces by using pervious pavements, and green rooftops.
- Use of native plants is recommended for all vegetated stormwater treatment areas, and disturbed areas adjacent to wetlands.

Soil Resources

As part of the review, ECCD completed a soil map of the site using the NRCS Soil Web. It is attached at the end of the report. Following is a brief description of each of the soil series mapped for this site according to the SoilWeb.

RIDGEBURY SERIES

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. Mean annual temperature is about 49 degrees F. and the mean annual precipitation is about 45 inches.

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 8 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.

WHITMAN SERIES

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. Mean annual precipitation is about 45 inches and mean annual temperature is about 49 degrees.

WOODBRIDGE SERIES

The Woodbridge series consists of moderately well drained loamy soils formed in subglacial till. They are very deep to bedrock and moderately deep to a densic contact. They are nearly level to moderately steep soils on till plains, hills, and drumlins. Slope ranges from 0 to 25 percent. Saturated hydraulic conductivity ranges from moderately low or moderately high in the surface layer and subsoil and low or moderately low in the dense substratum. Mean annual temperature is about 48 degrees F., and mean annual precipitation is about 46 inches.

CANTON SERIES

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. The mean annual temperature is about 46 degrees F. and the annual precipitation is about 44 inches.

CHARLTON SERIES

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. Mean annual temperature is about 50 degrees F., and mean annual precipitation is about 47 inches.

CHATFIELD SERIES

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. Mean annual temperature is 51 degrees F. and mean annual precipitation is 38 inches.

PAXTON SERIES

The Paxton series consists of well drained loamy soils formed in lodgement till. The soils are very deep to bedrock and moderately deep to a densic contact. They are nearly level to steep soils on till plains, hills, and drumlins. Slope ranges from 0 to 45 percent. Saturated hydraulic conductivity is moderately high or high in the surface layer and subsoil and low to moderately high in the substratum. Mean annual temperature is about 50 degrees F., and mean annual precipitation is about 47 inches.

MONTAUK SERIES

The Montauk series consists of very deep, well drained soils formed in till derived primarily from granitic materials. These soils are on upland till plains and moraines. Slope ranges from 0 to 35 percent. Saturated hydraulic conductivity is moderately high or high in the solum and low to moderately high in the substratum. Mean annual temperature is about 49 degrees F, and mean annual precipitation is about 45 inches.

Selected Soil Interpretations

In addition to the soil mapping, ECCD also conducted a selected soils interpretation for each of soil units identifying engineering concerns for construction of local roads and streets, engineering concerns for construction of small commercial buildings and identification of Connecticut wetland soil types. While general soil information can be helpful in identifying concerns with use or development, on-site investigations should be conducted to address specific concerns. This chart and associated ratings can be found at the end of this section.

Erosion Control

Erosion and sediment control plans and associated details were not included with the plan set and therefore not reviewed by ECCD. A fully detailed erosion control plan should also consider phasing, temporary stockpile and staging areas and detention areas to direct any silt-laden runoff.

In addition to soil limitations or concerns with construction, erosion and sediment control during development is also an issue. Of particular concern for this development, is the construction of the switchback road leading to the proposed well site. Terrain here is moderately sloping at points and can be difficult to permanently stabilize if drainage is not handled correctly.

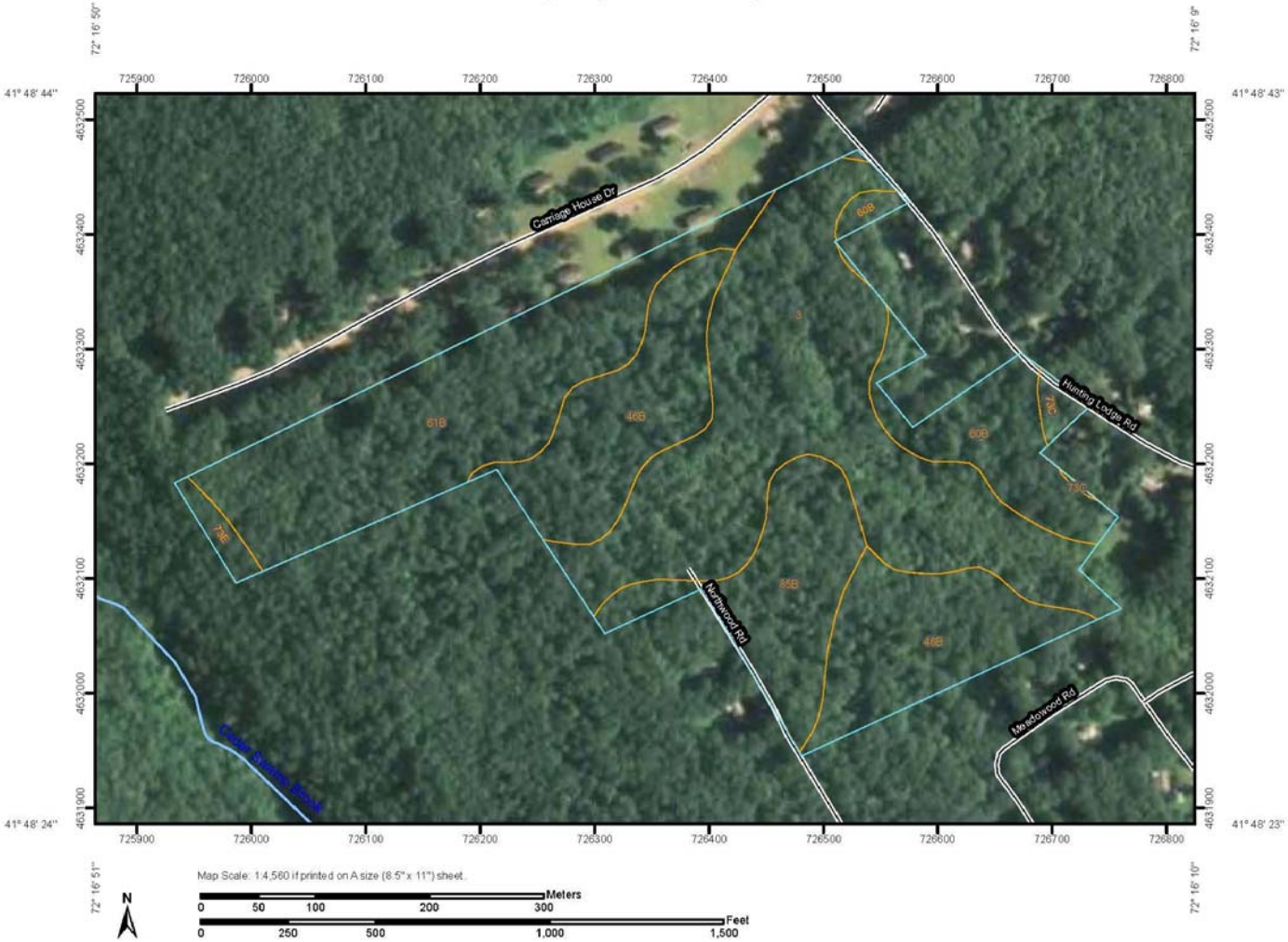
Work within and adjacent to wetland areas are also sensitive, especially during spring and fall rainy periods and outside of seeding timeframes, to ensure permanent stabilization. Continued diligent site inspections coupled with immediate corrective actions is critical in minimizing impacts.

It is not clear if the site has temporary construction access. Additionally if the timber bridges are used during active construction, deposited fill materials on the bridges may be another source of sediment to the wetlands.

Recommendations

- Soil limitations, such as steepness of slope, erosion hazards, and depths to groundwater and bedrock should be considered in the plan development stage.
- Erosion and sediment control plans should consider phasing of construction development and both short and long term erosion controls and site stabilization, as well as temporary stockpile and staging areas and stormwater run-off detention areas.
- Monitoring during any site construction is critical and should be handled by an individual with experience in sediment and erosion control.

Soil Map—State of Connecticut
(Soil Map-Mansfield-Ponde Place)



USDA Natural Resources Conservation Service

Web Soil Survey 2.1
National Cooperative Soil Survey

1/2/2009
Page 1 of 3

MAP LEGEND

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

Soils
- Soil Map Units

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

Special Line Features
- Gully
- Short Steep Slope
- Other

Political Features
- Cities

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:4,560 if printed on A size (8.5" × 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: 8/16/2006

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.

Map Unit Legend

State of Connecticut (CT600)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
3	Ridgebury, Leicester, and Whitman soils, extremely stony	16.1	33.7%
46B	Woodbridge fine sandy loam, 2 to 8 percent slopes, very stony	10.5	22.0%
60B	Canton and Charlton soils, 3 to 8 percent slopes	4.0	8.4%
61B	Canton and Charlton soils, 3 to 8 percent slopes, very stony	10.9	22.9%
73C	Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	0.4	0.9%
73E	Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	0.5	1.1%
85B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes, very stony	5.2	10.9%
Totals for Area of Interest		**47.7**	**100.0%**

Selected Soil Interpretations

This report allows the customer to produce a report showing the results of the soil interpretation(s) of his or her choice. It is useful when a standard report that displays the results of the selected interpretation(s) is not available.

When customers select this report, they are presented with a list of interpretations with results for the selected map units. The customer may select up to three interpretations to be presented in table format.

For a description of the particular interpretations and their criteria, use the "Selected Survey Area Interpretation Descriptions" report.

Report—Selected Soil Interpretations

Selected Soil Interpretations– State of Connecticut							
Map symbol and soil name	Pct. of map unit	Eng - local roads and streets		Eng - small commercial buildings		Inland wetlands (ct)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3—Ridgebury, Leicester, and Whitman soils, extremely stony							
Ridgebury	40	Very limited		Very limited		CT wetland	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
		Frost action	1.00				
Leicester	35	Very limited		Very limited		CT wetland	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
		Frost action	1.00				
Whitman	15	Very limited		Very limited		CT wetland	
		Ponding	1.00	Ponding	1.00		
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
		Frost action	1.00				
46B—Woodbridge fine sandy loam, 2 to 8 percent slopes, very stony							
Woodbridge	80	Somewhat limited		Somewhat limited		CT nonwetland	
		Frost action	0.50	Depth to saturated zone	0.39		
		Depth to saturated zone	0.19	Slope	0.13		

Selected Soil Interpretations– State of Connecticut							
Map symbol and soil name	Pct. of map unit	Eng - local roads and streets		Eng - small commercial buildings		Inland wetlands (ct)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
60B—Canton and Charlton soils, 3 to 8 percent slopes							
Canton	45	Somewhat limited		Somewhat limited		CT nonwetland	
		Frost action	0.50	Slope	0.50		
Charlton	35	Somewhat limited		Somewhat limited		CT nonwetland	
		Frost action	0.50	Slope	0.50		
61B—Canton and Charlton soils, 3 to 8 percent slopes, very stony							
Canton	45	Somewhat limited		Somewhat limited		CT nonwetland	
		Frost action	0.50	Slope	0.50		
Charlton	35	Somewhat limited		Somewhat limited		CT nonwetland	
		Frost action	0.50	Slope	0.50		
73C—Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky							
Charlton	45	Somewhat limited		Very limited		CT nonwetland	
		Frost action	0.50	Slope	1.00		
		Slope	0.04				
Chatfield	30	Somewhat limited		Very limited		CT nonwetland	
		Depth to hard bedrock	0.54	Slope	1.00		
		Frost action	0.50	Depth to hard bedrock	0.54		
		Slope	0.04				
73E—Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky							
Charlton	45	Very limited		Very limited		CT nonwetland	
		Slope	1.00	Slope	1.00		
		Frost action	0.50				
Chatfield	30	Very limited		Very limited		CT nonwetland	
		Slope	1.00	Slope	1.00		
		Depth to hard bedrock	0.54	Depth to hard bedrock	0.54		
		Frost action	0.50				

Selected Soil Interpretations– State of Connecticut							
Map symbol and soil name	Pct. of map unit	Eng - local roads and streets		Eng - small commercial buildings		Inland wetlands (ct)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
85B—Paxton and Montauk fine sandy loams, 3 to 8 percent slopes, very stony							
Paxton	55	Somewhat limited		Somewhat limited		CT nonwetland	
		Frost action	0.50	Slope	0.50		
		Depth to saturated zone	0.19	Depth to saturated zone	0.39		
Montauk	30	Somewhat limited		Somewhat limited		CT nonwetland	
		Frost action	0.50	Slope	0.50		
		Depth to saturated zone	0.03	Depth to saturated zone	0.07		

Data Source Information

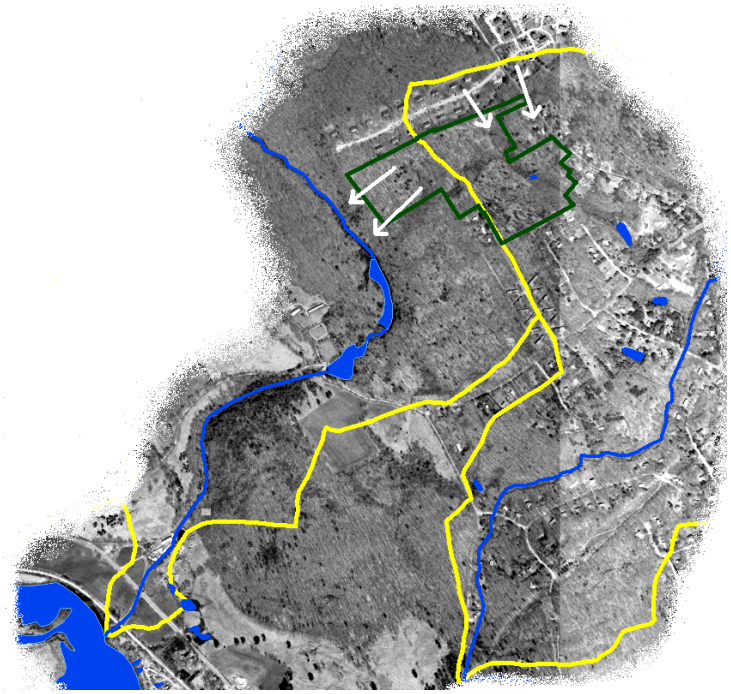
Soil Survey Area: State of Connecticut
Survey Area Data: Version 6, Mar 22, 2007

Wetland Review

The Ponde Place property is located in northwestern Mansfield about 1.8 miles south and 1.9 miles east of the Willington and Coventry town lines respectively. The property encompasses 45.93 acres. It is southeast of, and abuts, the Carriage House Apartments, a sixteen structure, off-campus housing project.
The Team visited the site on December 15, 2008. Rain had fallen the previous week yielding spring-like water level conditions in the wetlands. On Tuesday the sixth, there was .06 inches of measurable precipitation. On Wednesday, there was .53 inches, Thursday brought 1.45 inches, and on Friday the 12th, 1.98 inches of rain fell. Even though the weekend was dry, 4.04 inches of rain had fallen in the week before the Team arrived. In an already wet year, with many Connecticut stations reporting nearly twenty inches of rain above normal. Hampton, the nearest reporting station, had a precipitation total through December 31, 2008 of 69.77 inches, right in line with other statewide excesses that made 2008 the wettest year on record.

Site Observations

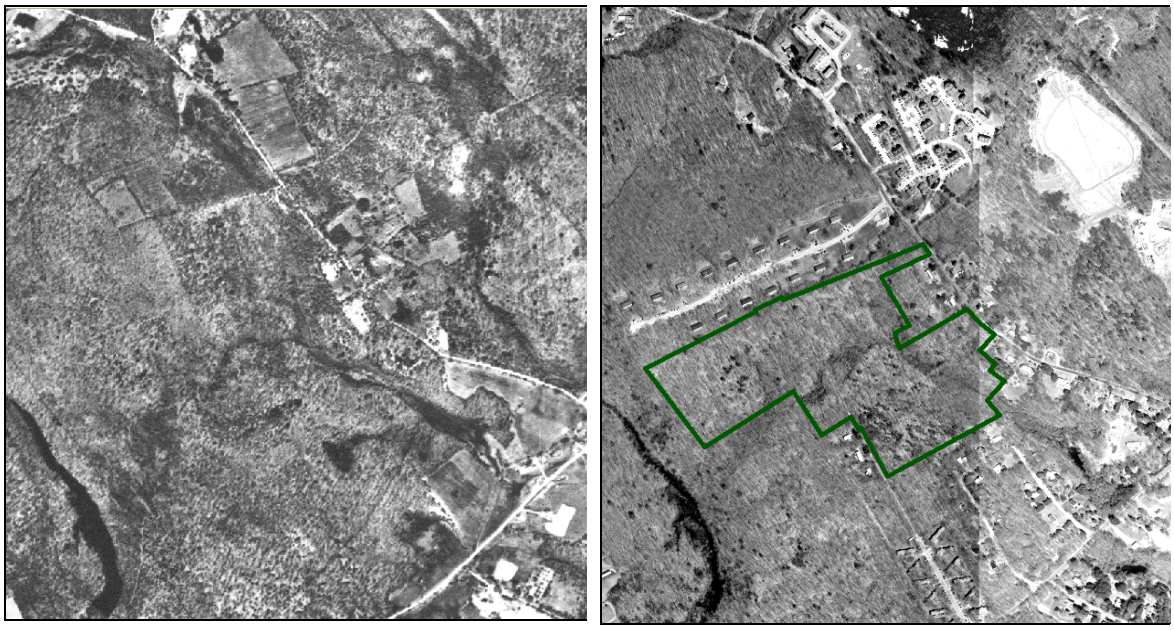
Generally, the site is very gently rolling with large areas of level ground. The steepest area is to the extreme west where the land slopes down to Cedar Brook Swamp via a 15+ per cent gradient. The highest point of land is 584 feet above mean sea level and is located along the north-northwest property boundary. The lowest point of land is in the southeast corner of the parcel dipping to approximately 542 feet.



Graphic 1 - The property straddles a local drainage divide. About thirty five percent of the property drains to the west into Cedar Swamp Brook. The other ~sixty five percent flows east and then south ultimately draining into Eagleville Brook. This graphic depicts the drainage off the site. The yellow line shows the drainage divide. The white arrows show the generalized direction of surface water flow/runoff. *(Graphic: DEP/GIS)*

As a result of being located at a drainage divide, or at the top of the watershed, the wetlands are at their most sensitive. It should be noted that frequently a drainage divide that exists in such a low gradient (flat) environment often does not cleave a sharp break

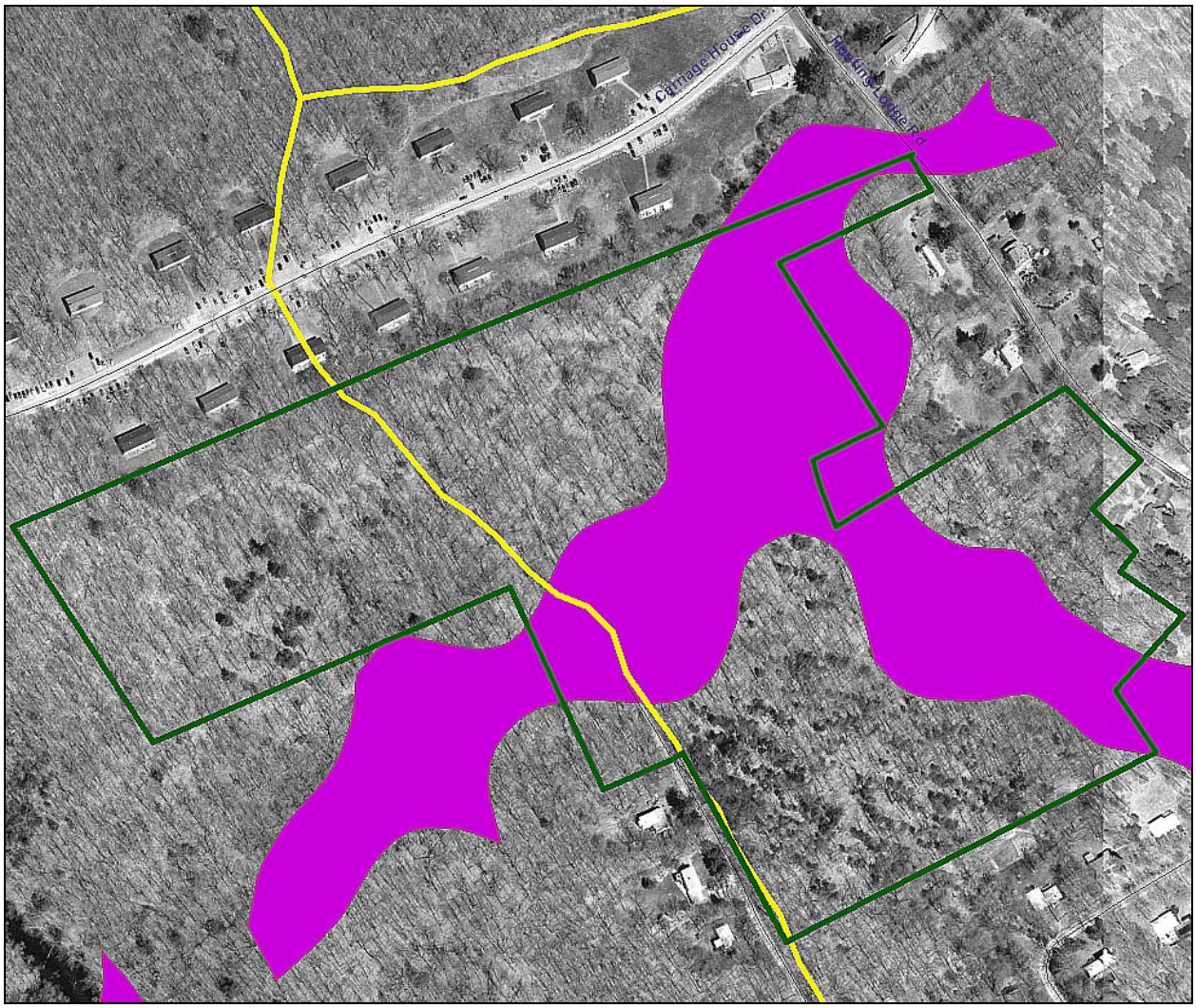
on the landscape. Rather, runoff direction can be determined by the amount of rainfall combined with the detriments to flow at the time. Thus, a downed tree or other coarse woody debris could serve, along with seasonally massive leave clutter, to alter direction of runoff. In this case however, that determination has been established long ago by the bed or foundation of the woods road that continues northerly from the end of hard surfaced Northwoods Road.



Graphic 2 *- The parcel is almost entirely wooded and has been for decades. In the two aerial photographs depicted above, the one on the left shows the general area in April of 1934. On the right, the property, with approximated boundaries, is shown in the spring of 2004. Both images are seen to have an overall gray pallor indicative of leafless deciduous trees. Conifers show up as dark spots. Generally, wetter soils appear darker than dryer soils. Open fields and/or cleared areas including roads are white; water bodies are black. (Source: 1934 Photo -Connecticut State Library; 2004 Photo – DEP/GIS)*

Rarely at the top of the watershed is there sufficient moisture to form a consistently flowing watercourse. This is the case on the west or Cedar Swamp Brook side of the parcel divide where, because of the flat terrain, only wetlands are mapped, no watercourse.

On the east side of the divide surface flow enters the property from higher in the watershed, and there is more geography to yield enough runoff to contribute to flow. As a result a small stream has been mapped on the southeast part of the parcel. (See *Graphic 4* next page.)



Graphic 3 *- This close up of the property is from a 2004 aerial photography. The estimated property boundary along with the yellow drainage divide and the massive (purple) wetlands as mapped by the USDA NRCS. Shadows of the leafless deciduous trees can be seen pointing north northwest. The darker, spotty woodland vegetation is the coniferous trees. The sixteen structures of the Carriage House Apartments, and even the automobiles in the parking lots, show up well bordering the parcel to the north. (Source: DEP/GIS)*

The Department of Environmental Protection's Geographic Information System (DEP/GIS) does not show any reported Leachate or Wastewater discharges on the site, nor did the field walk reveal any sources, that would impact the quality of either or both the surface water and groundwater. As a result, it can be reasonably assumed that the outflow from the property's wetlands in this predevelopment stage yields excellent water quality.

It is substantially noteworthy however, that the offsite water quality of Eagleville Brook, into which these wetlands ultimately drain, have been compromised elsewhere in its watershed.

Water Quality Mapping

In the graphic below, the approximated property boundary is in green with white arrows showing the generalized direction of surface water runoff from the site. To the west of the yellow drainage divide the two arrows show flow heading for the Cedar Swamp Brook. In this case the brook is depicted as orange because its water quality has been compromised upstream in the watershed. Orange represents water quality level "B" with intent to upgrade to "A". These letters of quality are from a scale which has "AA" being the best, "A" being next, then "B", "C" and "D". The further into the alphabet the letter the more degraded the water quality. (The full text of DEP's *Water Quality Standards and Criteria* can be found on the web at: http://www.ct.gov/dep/lib/dep/water/water_quality_standardsl/wqs.pdf)

On the east side of the yellow divide in the graphic below the water shown as a stream leaves the property as water quality "A" (violet in color) and flows downstream approximately one half mile where it enters the degraded, "B" quality, Eagleville Brook, depicted in orange.

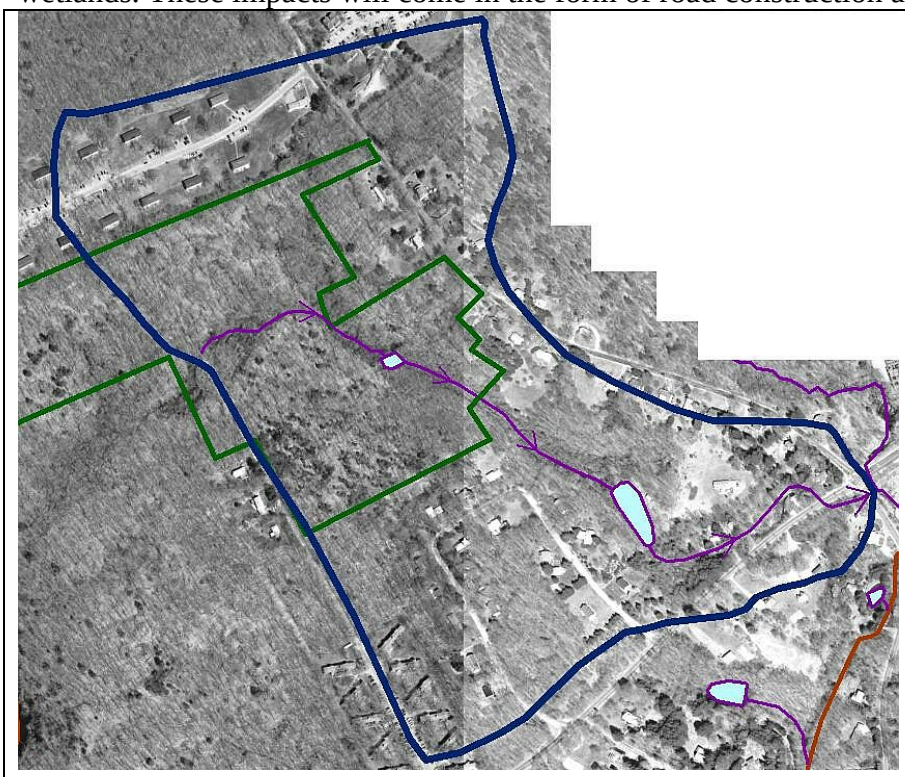
Graphic 4 – Water Quality mapping. *Source DEP/GIS*

Thus, since the current quality of the runoff from this property is "A" and flows into a compromised watercourse (IE: "B") it is imperative that the post development water quality maintain its "A" status and not impact or detract from the long term upgrading plan of both "B" quality water resources.

The Wetlands

Much of the wetland investigation and documentation for the site has been completed. The wetland soils have been delineated and a wetland report of the property has been provided. Indeed, the remaining work to be done is to make assessments and recommendations about inevitable impacts of this proposal to protect the existing wetland system.

The parcel itself, 45.93 acres, is made up of 7.5 acres of wetlands. This represents 16.3% of the total acreage. The wetlands on the parcel are part of a larger wetland system (see Graphic 3 above) which the property intercepts. These wetlands are positioned so that proposed access to the non-wetland portions of the property must impact the existing wetlands. These impacts will come in the form of road construction and road crossings.



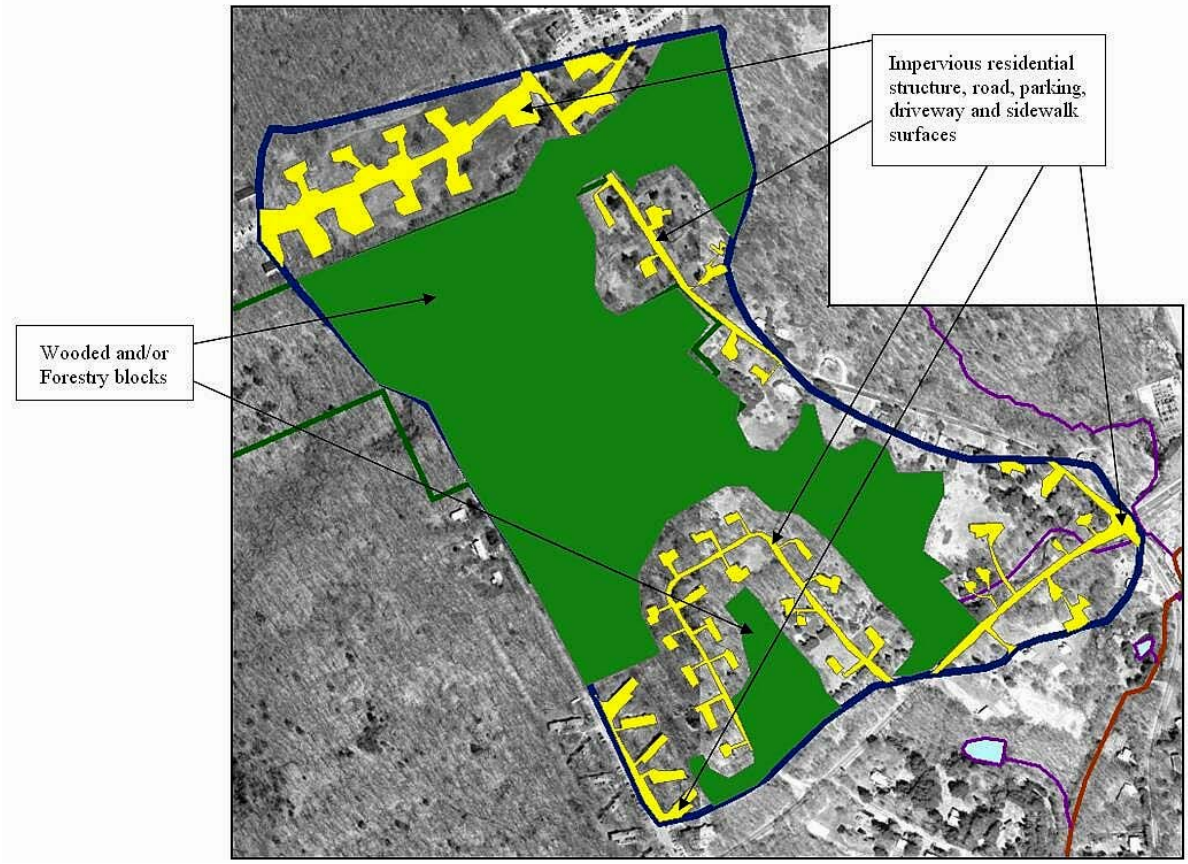
Graphic 5 - The intermittent stream that drains the property has a watershed of 112 acres (see graphic at left). As described above, this local watershed yields Water Quality "A" which is uncommon in the larger, impacted Eagleville Brook, which receives this drainage.

Watershed Land Use / Impervious Surface

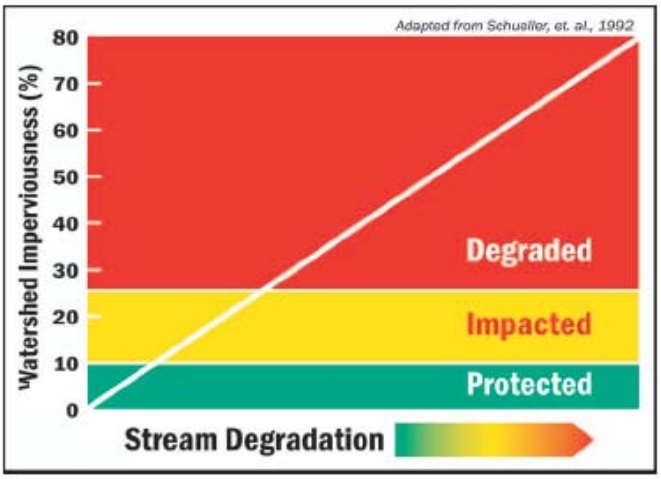
As seen on the 2004 aerial photography, this 112 acre watershed is dominated by single family residences. The northwest and southwest corners of the drainage are home to higher density, off-campus apartment complexes.

A general estimate of wooded landscape within the drainage yielded two parcels. The larger of these is 53 acres, the smaller being 4.2 acres. The total of these two land areas is 57.2 acres which represents 51 percent of the land in the watershed.
The balance of the watershed acreage, the 49 percent, is in low density housing, yards - many with trees, lawns, fields, roads, and parking lots. The two dorm/apartment

complexes yield relatively abundant impervious surface (rooftops, patios, roads and parking areas; including only a minimum of hard packed lawn.)



Graphic 6 - In the graphic above of the 112 acre watershed, five arrows emanate from the "Impervious" text box and two from the "Wooded" text box. The acreages of the five impervious sectors, moving clockwise from the very top, are: 5.1, 1.3, 2.0, 2.5 and 1.1. These five acreages total twelve acres, or eleven percent of the watershed. The definition of what is and is not impervious surface can be argued, but this rough estimate is fairly conservative. While roads and rooftops are pretty straightforward, highly compacted dorm "lawn" areas are a little more arguable. All the calculations err on the side of being conservative. A few areas of structural locations such as that in the extreme southeast corner of the drainage were not included to counter any over estimations elsewhere.
The above exercise depicts the incremental impacts of previous development within the 112 acre watershed with a view to the overall long term health of the wetlands and water course.



Graphic 7 - *This graphic is taken from NEMO (UConn's Nonpoint Education for Municipal Officials) Fact Sheet Number 3 entitled:* Impacts of Development on Waterways. *The fact sheet and this graphic are available on line at:* *http://nemo.uconn.edu/tools/publications/fact_sheets/nemo_fact_sheet_3_s.pdf* . *The NEMO URL:* *http://nemo.uconn.edu/tools/publications.htm* *may be visited for many other Facts Sheets on Nonpoint pollution information for municipal officials.*

A rule of thumb for any given drainage: the water quality decreases as impervious surface in the watershed increases. (Impervious surfaces are generally thought of as roads, driveways, roof tops, sidewalks, etc.) The numbers/ranges seen in the above graphic are often referred to when reviewing long term health of the watershed.

Generally speaking, the water quality of the stream is considered to be well protected when the imperviousness in the watershed is 0-10 percent of the total land cover. The studies show that from 10 percent to about 26 percent imperviousness, the water quality is impacted. After about 26 per cent definite degradation takes place. As with many studies, the numbers are not absolute for every scenario, but the concept is sound. Impervious surfaces become a critical predictor of future water quality.

Impervious surface totals provided by the developer at the ERT meeting were in the range of 40 percent of the parcel. This would add 18 acres impervious surface to the property. Of this total approximately (gross estimate) two thirds, 12 acres (10.7 percent) is within the 112 acre watershed east of the drainage divide. Thus, upon completion, this small, 112 acre watershed will be well into the "Impacted" category for water quality and approaching the 26 percent "Degraded" rating as a result of the proposed increase in impervious surface.

Pre - Construction impervious surface estimates for the unnamed 112 acre watershed:

Land Use Type	**Total Acres**	**Percent of Watershed**
Woodland & Forested Wetlands	57.2	51.1
Impervious surface	12.0	10.7
Other: backyards, lawns, trees	42.8	38.2
Totals:	112	100

Post - Construction impervious surface estimates for the unnamed 112 acre watershed:

Land Use Type	**Total Acres**	**Percent of Watershed**
Woodland & Forested Wetlands	45.2	41.4
Impervious surface	24.0	21.4
Other: backyards, lawns, trees	42.8	38.2
Totals:	112	100

As it exists now the 112 acre watershed it is right on the edge of the 10 percent line between being protected and being impacted. Certainly the proposed development in this 112 acre watershed will push the percentage quite a ways into the "impacted range" and well towards the "degraded" break for water quality.

That means the construction work for the road system as proposed must meet and consistently maintain the highest standards of soil erosion and sediment control protection during the short term implementation and the long term maintenance. Questions the Mansfield commission must get response to before construction begins:

- How much wetland will be permanently lost due to road construction?
- If there is dredging where will the dredge spoils be contained and what will become of them?
- How will the existing water courses and wetlands be protected during construction?
- Who will oversee this work?

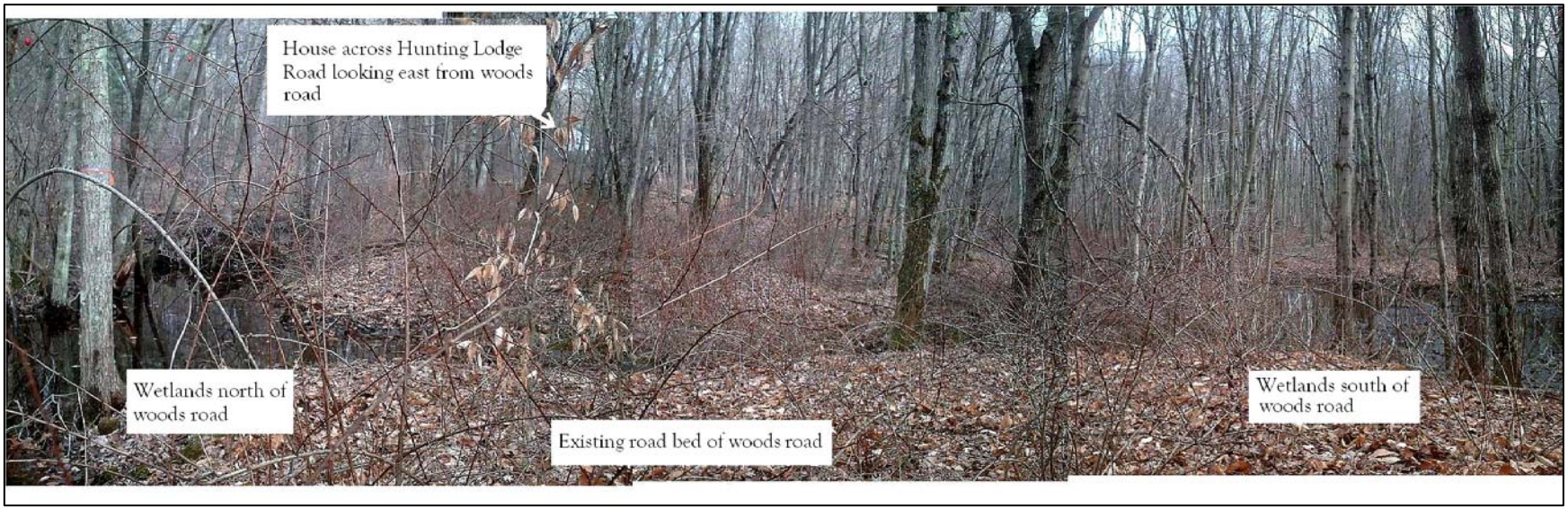
- What will be the town's response to failures of these proper protection procedures?
- If wetlands are lost during construction how/where will these wetland losses be mitigated?
- What will be the timing of the construction project? In some instances dry-season construction has helped minimize impacts to the wetlands and watercourses on site.
- The catch basin and swale design will be an integral part of the sediment collection system (especially regarding road sand). What is the predicted cleanout schedule for these basins and who will oversee this maintenance? (IE: when the basins fill with sediment, future sediment passes right through to the swales which in time will have their filtering capability compromised possibly overrunning into the wetlands.

The field walk showed the team members that the track record for successful soil erosion and sediment control measures at construction projects in this immediate vicinity has not been good. Below can be seen images of the walking trail being constructed abutting the property along Hunting Lodge Road taken on the date of the field review.

Graphic 8 and 9 **-** Unprotected loose soil is prone to gullying with the transport of fine grained material down slope. Here unprotected loose soils have experienced gullying with the resulting mini-delta at the base of the runoff slope.

The complete failure of this soil erosion silt fence along Hunting Lodge Road speaks directly to the concern regarding the oversight and protection of the wetland resource from sediment loading during proposed construction.

Loose soils, poor execution of soil erosion protection and meager oversight (indicative of poor reporting to local authorities and poor municipal response to correct the problem) can only lead this reviewer to the inevitable conclusion that the wetland resources WILL be impacted during the construction of this project.



Graphic 10 - The photo montage below was taken from the existing woods road within the wetlands looking out toward Hunting Lodge Road. This avenue will become the main entrance road into the property. This woods road will have to be widened, reinforced, and stabilized for projected automobile traffic for the three multi-story apartment buildings.

What time of year will this work be done and how will the wetlands be protected during construction?

Final Comments

We have seen the water quality of the 112 acre watershed is good (rated “A”). We have seen this is one of the few watersheds that currently yield clean water into the degraded Eagleville Brook. We have seen that development within this small watershed is right at the cusp of impacting water quality, and we have seen that proposed construction will boost the future water quality well on its way towards a “Degraded” rating. And we have also seen that neighboring construction has impacted the wetlands through negligent soil erosion and sediment controls.

Thus, the overriding question for the town, in the face of a current abutting project that seems to show minimal importance of wetland protection issues, is how will this large project, to be constructed literally within-the-wetlands, be different from the current project along Hunting Lodge Road and provide for the long term health of the wetlands and accompanying watercourse?

Fisheries Resources

Cedar Swamp Brook borders the proposed development to the west while an unnamed tributary watercourse to Eagleville Brook flows through the property. CTDEP Inland Fisheries Division (IFD) electrofishing survey data were collected from the Cedar Swamp Brook mainstem on June 29, 1994. Sampling was conducted approximately 200 meters downstream from the Nelson Brook confluence. The stream was found to support a coldwater fish community comprised of: fallfish, white sucker, common shiner, blacknose dace and native brook trout. Realizing the importance of brook trout and their habitats, a unique partnership is now underway between state, federal, and local agencies, academia, as well as non-profit government organizations and private citizens called the Eastern Brook Trout Joint Venture (EBJTV). As part of the National Fish Habitat Initiative, this venture is a geographically focused, locally driven scientifically based effort with goals to protect, restore, and enhance aquatic habitat throughout the eastern range of brook trout. More can be learned about these efforts at http://www.easternbrooktrout.org/.

Based upon a field inspection and existing knowledge of the Eagleville Brook Watershed, it appears that the unnamed tributary to Eagleville Brook on this property and associated riparian wetlands do not support a fish community. The watercourse appears to be intermittent based upon field and mapping conditions. One of the more important functions of these streams is to provide clean and unpolluted waters to downstream areas of a watershed, which contain an increased diversity of aquatic organisms. This is especially true in this situation where the downstream recipient waters of Eagleville Brook are water quality impaired.

Eagleville Brook was included in the 2004 List of Connecticut Waterbodies Not Meeting Water Quality Standards by the CTDEP as required under Section 303(d) of the Federal Clean Water Act. Under section 303 (d), states are required to develop a Total Maximum Daily Load (TMDL) for waters impaired by pollutants. TMDL is a tool water quality managers use to address water quality problems. TMDLs provide the framework for restoring impaired waters by establishing the maximum amount of a pollutant that a waterbody can take in without adverse impact to fish, wildlife, recreation, or other public uses. The final TMDL report for Eagleville Brook can be viewed at http://www.ct.gov/dep/lib/dep/water/tmdl/tmdl_final/eaglevillefinal.pdf. The TMDL for Eagleville Brook was developed using percent Impervious Cover (IC) as a surrogate for myriad stormwater runoff pollutants that can impact aquatic life (CTDEP 2007). Eagleville Brook has a severe sediment loading problem due to excessive stormwater runoff resulting from watershed development and the increase in the amount of impervious cover (IC) surfaces. As a consequence, sedimentation has degraded the quality and quantity of instream habitats for aquatic life. Annual IFD electrofishing surveys since 2002 indicate that very few fish reside in the upper portion of Eagleville Brook where large amounts of potential stream habitats are “unoccupied” by fish.

Potential Impacts

Stream Sedimentation

The proposed 45.93 acre development is being "squeezed" into uplands requiring 2 crossings of the unnamed tributary and its associated riparian wetlands. During any future development of this parcel, topsoil may become exposed and susceptible to runoff events, especially since most development will border wetlands associated with the unnamed tributary to Eagleville Brook. While this unnamed tributary does not support a fish community, downstream areas of Eagleville Brook do support aquatic life, albeit impaired. It is hoped that the Eagleville Brook fish community can be restored in the future. Thus, it is critical that this tributary does not become a "new source and conduit" of more harmful sediments. Currently, this watercourse shows minimal evidence of excessive sedimentation except for the upper section of the watercourse near the Carriage House Apartment complex that has recently received sediment runoff from the bikeway widening project.

The negative impacts of sediment runoff have been well documented by researchers. Sediment will reduce populations of aquatic insects and fish by eliminating physical habitat while suspended sediments will reduce dissolved oxygen levels (Cordone and Kelley 1961). Suspended sediments may prevent successful nest development of trout (Bell 1986). As reported by Meehan (1991), sediment deposition can severely impact spawning substrate abundance and quality. Reductions in egg survival are caused by smothering and insufficient oxygen supply (Bell 1986). Meehan (1991) indicated that erosion and sedimentation of instream habitat could alter channel morphology by increasing the stream width-depth ratio, incidence and severity of stream bank erosion, channel braiding, and reduce pool volume and frequency.

Stormwater

The goal of the Eagleville Brook TMDL is to reduce stormwater impacts to aquatic resources, as such, the TMDL target is 12% Impervious Cover (IC) within the contributing watershed (CTDEP 2007). The 12% IC threshold represents the level of imperviousness below which the brook is capable of supporting a macroinvertebrate community that meets aquatic life use goals in Connecticut Water Quality Standards. The 12% IC threshold is within the range of % IC values generally reported in the literature (CTDEP 2002; MDEP 2005). The Ponde Place residential development proposal is within the subsection of Eagleville Brook Watershed (from confluence with Kings Brook to headwaters near UConn campus) where IC is 14% based upon 2002 landcover data. Consequently, the TMDL objective is a 21% reduction in IC accomplished by improved stormwaters management. Information provided to ERT members stated that the total impervious cover development footprint will approximate 40% of the parcel or approximately 18 acres (see wetland section for more details). This increase in IC within this subsection of the Eagleville Brook watershed is contrary to Eagleville Brook TMDL objectives and represents a possible additional stormwater pollution source.

A review of the Ponde Place Engineering and Design report by F.A. Hesketh & Associates revealed that existing combined peak flow at Design Point "Z" (combined discharge to the unnamed tributary to Eagleville Brook at proposed Road A timber bridge crossing) will increase from 17.1 cfs to 26.2 cfs in a 2 year storm event. This 9.1 cfs increase in streamflows and increase in water velocities can lead to possible channel incision and increased instream erosion/sedimentation of the unnamed tributary; thus, stormwater runoff from this development could become an additional "point source of sediment" conveyed into downstream recipient waters of Eagleville Brook adding to water quality impairment. Numerous field observations during storm events since 2002 by the Team's fisheries biologist reveal low turbidity and suspended sediment levels in this tributary watercourse unlike the very turbid conditions observed within the mainstem of Eagleville Brook and other tributary streams in this section of the watershed. These conditions are likely to change after development due to stormwater runoff increases.

Recommendations/Comments

Stream Crossings

No specific details were provided regarding timber bridge construction and wetland impacts. Given the length of the two proposed crossings, it is likely that bridges will be supported by piers requiring the filling of wetlands. Efforts should be made to minimize wetland loss and disturbance. Construction should occur during the summer low flow period. It is advised that project developers refer to the DEP stream crossing guidelines publication for technical guidance regarding the construction of the 2 timber bridges to cross the unnamed tributary to Eagleville Brook and riparian wetlands. This publication can be obtained on the DEP website at:
http://www.ct.gov/dep/lib/dep/fishing/restoration/streamcrossingguidelines.pdf.

Riparian Corridor Protection

It is the policy of the IFD that riparian corridors be protected with an undisturbed 100 ft. wide riparian buffer zone along both sides of a perennial watercourse; 50 ft. wide riparian buffer zone along both sides of an intermittent watercourse. A riparian wetland buffer is one of the most natural mitigation measures to protect water quality and aquatic resources of watercourses. Riparian corridor policy and supportive documentation can be viewed on the DEP website at:
http://www.ct.gov/dep/lib/dep/fishing/restoration/riparianpolicy.pdf and
http://www.ct.gov/dep/lib/dep/fishing/restoration/riparianpositionstatement.pdf.

Erosion and Sediment Control Plan

It is recommended to develop an aggressive and effective erosion and sediment control plan that utilizes guidance as described in the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Manual. This is critical given that the development is surrounded by wetlands. Proper installation and maintenance of erosion/sediment controls is critical to environmental well-being. This includes such mitigative measures as filter fabric barrier fences, staked hay bales, and sediment basins. Land disturbance and clearing should be kept to a minimum and completed in phases. All disturbed areas

should be re-stabilized as soon as possible. Exposed, unvegetated areas should be protected from storm events. The applicant and the local wetland enforcement officer should be responsible for checking this housing development on a periodic basis to ensure that all soil erosion and sediment controls are being maintained. In addition, the applicant should post a performance bond with the town to protect against possible soil erosion violations. Past siltation disturbances in Connecticut have occurred when individual contractors either improperly deployed mitigation devices or failed to maintain these devices on a regular basis, especially after storm events.

Stormwater Management

Since this development will result in a net increase in the amount of IC within the Eagleville Brook watershed, it is highly recommended that project design be modified to include more pervious pavement within parking lot areas. This includes such features as concrete grid pavers, drivable grass concrete systems and pervious asphalt. More information can be obtained from Nonpoint Education for Municipal Officers (NEMO) website at: http://nemo.uconn.edu/tools/stormwater/pavements.htm. In addition, the developer should refer to the DEP 2004 Connecticut Stormwater Quality Manual (CTDEP 2004) and Stormwater TMDL Implementation Support Manual (ENSR 2006) for more technical guidance.

The Eagleville Brook TMDL states that in the "absence of actual IC reduction", stormwater management techniques that offset the negative effect of IC should be implemented in the Eagleville Brook watershed (CTDEP 2007). The strategy should include 1) reducing IC where practical, 2) disconnecting IC from the surface waterbody, 3) minimizing additional disturbance to maintain existing natural buffering capacity, and 4) installing engineered BMPs to reduce the impact of IC on receiving water hydrology and water quality. The developer needs to demonstrate that the proposed development design adequately addresses these TMDL strategies.

As previously mentioned, a net 9.1 cfs increase in streamflow during a 2 year storm event may exacerbate instream erosion and sediment loading to Eagleville Brook. If this development is to be constructed, it highly recommended that the stormwater management plan incorporate "stormwater detention" within development design to minimize any post-development increases in stormwater runoff volume. Care should be exercised to properly site stormwater detention to minimize impacts to wetlands.

One of the most damaging impacts from stormwater runoff is the influx of roadway sands into watercourses as a result of winter roadway deicing activities. To help mitigate sand runoff into the unnamed tributary to Eagleville Brook, the use of sand on paved surfaces for winter deicing should be prohibited. Many towns in the State and the CTDOT now utilize an environmental friendly salt mixture for winter deicing with no sand.

The development should minimize the use of lawn chemicals and use fertilizers with little or no phosphorus. The use of low or non-phosphorous fertilizers can provide nutrients to turfgrass while avoiding threats to water quality.

Summary

The footprint of the Ponde Place Apartment Community requires the development to be squeezed into available uplands by crossing the unnamed tributary to Eagleville Brook and its riparian wetlands at two locations. In essence, this development appears to be oversized when compared to available lands. There is minimal open space.

The developer and Town of Mansfield should review the Eagleville Brook TMDL report and determine if the development as currently designed adequately addresses TMDL strategies that can minimize future aquatic resource impairment within Eagleville Brook.

If this development is to receive approvals from local planning agencies, it is highly recommended that IC be "significantly reduced" and stormwater detention be incorporated into revised design.

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The Natural Diversity Data Base

The Natural Diversity Data Base maps and files regarding the project area for the proposed Ponde Place residential apartment community have been reviewed. According to our information, there are records for State Threatened *Gyrinophilus porphyriticus* (northern spring salamander), *Eremophila alpestris* (horned lark) (Historic Record) and State Special Concern *Synaptomys cooperi* (southern bog lemming) (Historic Record) and *Glyptemys insculpta* (Wood turtle) from the vicinity of this project site. (Please see Appendix for DEP Fact Sheets.)

Wood turtles require riparian habitats bordered by floodplain, woodland or meadows. They hibernate in the banks of the river in submerged tree roots. Their summer habitat includes pastures, old fields, woodlands, powerline cuts and railroad beds bordering or adjacent to streams and rivers. This species has been negatively impacted by the loss of suitable habitat.

If Wood turtle habitat exists on the proposed site and will be impacted by the project, the Wildlife Division recommends that a herpetologist familiar with the habitat requirements of this species conduct surveys between April and September to see if they are present. A report summarizing the results of such surveys should include habitat descriptions, reptile and amphibian species list and a statement/resume giving the herpetologist' qualifications. The DEP doesn't maintain a list of qualified herpetologists. A DEP Wildlife Division permit may be required by the herpetologist to conduct survey work, you should ask if your herpetologist has one. The results of this investigation can be forwarded to the Wildlife Division and, after evaluation, recommendations for additional surveys, if any, will be made.

The Northern Spring Salamander requires cold, clean, well-oxygenated springs, brooks or seepage areas. Their favored habitat is heavily forested steep rocky ravines. While they could probably tolerate a decrease in water supply if it remained cold - the complete lack of water would jeopardize this species existence.

The nesting season for Horned Lark extends from the end of March to the middle of August. Construction should be done during the non-breeding season.

The Southern bog lemming is closely associated with sphagnum bogs where it usually lives, tunnels and burrows in deep, thick leaf mold. Their burrows may be up to one foot below ground. They feed on the leaves, stems, and seeds of grasses, sedges, fungi, moss, bark and ground pine and occasionally insects. Any activities that impact the sphagnum bogs or wetlands and their associated food sources will affect the Southern bog lemming. If this work will be conducted in any Spring Salamander or Southern bog lemming habitat, the Wildlife Division recommends that a biologist familiar with the habitat requirements of these species conduct surveys. A report summarizing the results of such surveys should include habitat descriptions, amphibian and mammal species list and a statement/resume giving the biologist' qualifications The DEP doesn't maintain a list of

qualified biologists. The results of this investigation can be forwarded to the Wildlife Division and, after evaluation, recommendations for additional surveys, if any, will be made.

Please be advised that the Wildlife Division has not made a field inspection of the project nor have we seen detailed timetables for work to be done. Consultation with the Wildlife Division should not be substituted for site-specific surveys that may be required for environmental assessments. The time of year when this work will take place will affect this species if they are present on the site when the work is scheduled. Please be advised that should state permits be required or should state involvement occur in some other fashion, specific restrictions or conditions relating to the species discussed above may apply. In this situation, additional evaluation of the proposal by the DEP Wildlife Division should be requested. If the proposed project has not been initiated within 6 months of this review, contact the NDDB for an updated review. If you have any additional questions, please contact Julie.Victoria@ct.gov please reference the NDDB #16565.

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 Department of Environmental Protection's Geological and Natural History Survey and cooperating units of DEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the Data Base should not be substitutes for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Data Base as it becomes available.

Also be advised that this is a preliminary review and not a final determination. A more detailed review may be conducted as part of any subsequent environmental permit applications submitted to DEP for the proposed site.

Watershed Management and Low Impact Development

The following comments and recommendations to the Town of Mansfield are given from the perspective of improving or maintaining water quality 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 may vary in size from the small drainage of a backyard pond to the drainage of headwaters streams and tributaries of lakes and rivers. It can be 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 in-stream 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 (e.g. cluster housing) can not only minimize nonpoint source pollution and protect the environment, but also reduce infrastructure costs while affording neighborhoods the opportunity to stay connected with their environment. As we look to incorporating building ideas and practices of "smart growth", greenways, environmental equity, and better land use planning, it is important for all towns to consider and address all of the impacts, current and future that are associated with new development.

Proposed Project

The proposed Ponde Place development by The Keystone Companies, LLC is situated on a 45.93 acre parcel of land on Hunting Lodge Road located just to the west of The University of Connecticut (UCONN) Storrs campus. The developer has proposed a 632 bed multi-family housing project consisting of three 3-story apartment buildings with 52

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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.

units each and 18 townhouses with a total of 667 parking spaces. The property is to be served by an on-site well(s) for domestic use with an anticipated usage not to exceed 45,000 gallons per day. Water for fire suppression needs only would be provided by the University. Additionally, the applicant intends to connect to the UCONN sanitary sewer system and is in current negotiations. Two wooden timber bridges are planned to cross portions of the 7.5 acres of wetland located on the property from Hunting Lodge Road to provide access to the site.

Brief Site Description

The property is located within the watersheds of both Cedar Swamp Brook and Eagleville Brook which are tributaries of the Willimantic River. A vernal pool is located on the western portion of the site adjacent to an old farm road that extends north from Northwood Road. The eastern portion of the site contains extensive wetlands as well as an intermittent/perennial stream complex that receives drainage from property located to the east across Hunting Lodge Road. This stream is a tributary of Eagleville Brook. Slopes on the property are mainly gentle except in the far western portion of the site where they are steeper and other small locations scattered about the site. The soils on the property are classified by the USDA NRCS as a mixture of very stony Charlton and Canton soils, Woodbridge fine sandy loams also stony in nature, very stony Paxton and Montauk fine sandy loams, and relatively large percentage of poorly and very poorly drained and extremely stony Ridgebury, Leicester, and Whitman soils that are associated with the wetland areas of the site.

Water Quality Classification

Connecticut Water Quality Classifications, based on the adopted Connecticut Water Quality Standards, establish designated uses for surface and ground waters and identify the criteria necessary to support those uses. The designated use(s) and criteria serve to focus the department's water quality management activities, including establishment of water quality based treatment controls and strategies required by the federal Clean Water Act[3]. Cedar Swamp Brook is classified as Class B with a goal of Class A. Class A surface waters are waters that are designated for: habitat for fish and other aquatic life and wildlife; potential drinking water supplies; recreation; navigation; and water supply for industry and agriculture. The designation of a surface water as Class B/AA, B/A, or others is not a reason for allowing a new discharge that would prevent the attainment of Class AA, A or other classes for that waterbody.

Eagleville Brook is also designated as Class B/A. It was included on the *2004 List of Connecticut Waterbodies Not Meeting Water Quality Standards* (2004 *List*) due to exceedences of the aquatic life criteria contained within Connecticut's *Water Quality*

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

Standards. At the time the cause of the impairment was unknown, leading to a Total Maximum Daily Load (TMDL) analysis. The results indicated that a complex array of pollutants transported by stormwater was the most probable cause of the impairment. The TMDL was developed using Impervious Cover (IC) as a surrogate parameter for a mix of pollutants conveyed by stormwater. The TMDL has been established as the percent of impervious cover (% IC) throughout the watershed that must be achieved to meet the aquatic life use criteria and attain the designated aquatic life uses. The target goal for impervious cover in the watershed is 12%[4].

According to the TMDL document, the portion of Eagleville Brook in which the Ponde Place development is proposed has a mix of urbanized UCONN campus and residential development. The current impervious cover of this section of Eagleville Brook is 14% which translates to a 21% impervious cover reduction needed to meet the TMDL goal of 12%. In the absence of an actual IC reduction, stormwater management techniques that offset the negative effect of IC should be implemented in the Eagleville Brook watershed. Meeting the TMDL will be assessed by measuring the aquatic life directly. Tracking the IC elimination /disconnection or equivalent IC reduction in the watershed during best management practices (BMP) implementation may be used as an interim measure to assess progress. It should be noted that the necessary reductions in % IC discussed above reflect reductions from current conditions. Future development activities such as this proposal have the potential to increase impervious cover, and should be constructed and operated to limit the degrading effects of stormwater from impervious cover on the aquatic life in Eagleville Brook. For more information regarding the water quality classifications for surface and ground water, please refer to the Water Quality Standards document found at: http://www.ct.gov/dep/lib/dep/water/water_quality_standardsl/wqs.pdf. Additional information regarding the Eagleville TMDL is available on the CT DEP website at: http://www.ct.gov/dep/lib/dep/water/tmdl/tmdl_final/eaglevillefinal.pdf

Leachate and Wastewater Discharge Inventory

There are no known leachate or wastewater discharges (LWW) included in the Connecticut DEP databases for this property. There is an active LWW discharge record (3100038) for an area located to the east of this property across Hunting Lodge Road. This is indicated as a contaminated well with a status of Active.

Contamination or Potential Contamination Sites

The DEP maintains a database of "Hazardous Waste Facilities" as defined in Section 22a-134f of the Connecticut General Statutes. A review of the listings within the Town of Mansfield does not indicate any sites within or proximate to this proposed

[4] State of Connecticut, Department of Environmental Protection. 2007. A Total Maximum Daily Load Analysis for Eagleville Brook, Mansfield, CT.

development site. However, the site is located in the vicinity of the former UCONN landfill and it is recommended that the Town request an updated DEP statement relative to a potential impact from on-site (Ponde Place) ground water high pumping rates on the monitored contamination plume originating from the now closed and remediated UConn landfill and chemical pit area east of the Ponde Place parcel. The town should contact Raymond Frignon of DEP's Bureau of Water Protection and Land Reuse, Remediation division, at (860)424-3797.

Registered Underground Storage Tanks (USTs)

There are no registered USTs in the DEP database in the immediate area of this parcel.

Consumptive Water Diversions

The DEP maintains a database of registered and permitted water diversions as well as community and non-community wells. The database indicates no registered or permitted diversions near the property. There are two records (Well 1, Number 2550408, and Well 2, Number 2551416) that are associated with Carriage House Apartments, an adjacent property.

Information presented at the ERT Meeting on December 15, 2008 indicated the developer plans to provide water via on-site community well(s). In 2006, The University of Connecticut Water and Wastewater Systems Policy Advisory Group had previously recommended, and The University approved, a maximum supply of 45,000 gallons per day upon full build-out of this development. During the summer of 2008 the University informed the developer that they would not be able to supply the previously agreed upon volume in light of ongoing water supply studies and interim management measures. The development was designed with this 45,000 gpd volume average and the developer will be seeking to provide that by the on-site well. Section 22a-377(a)(1) of the Connecticut General Statutes provides an exemption from the Water Diversion Policy Act for one or more wells joined in one system whose combined maximum withdrawal will not exceed fifty thousand gallons of water during any twenty-four-hour period. Without actual metered well production data, estimated averages can be used to derive potential maximum daily usage. A conventional method for doing so is to multiply average use by a factor of 1.5. Applying this factor to your average irrigation estimate would result in the development's maximum daily usage of 67,500 gpd. Based on this best available information, it is reasonable to conclude that the developer most likely does not qualify for the above referenced statutory exemption. Therefore, the developer should be advised to submit an application for a consumptive water diversion permit pursuant to Section 22a-368 of the Connecticut General Statutes. It should be noted that the withdrawal of water from one or more wells joined in a system whose combined withdrawal will exceed 50,000 gallons of water during any 24-hour period <u>without</u> the required state permit is a

violation of the law and is subject to enforcement proceedings, including injunction, forfeiture, and penalties under Chapter 439 and section 22a-376 (22a-44) of the Connecticut General Statutes. For more information please contact Douglas Hoskins of the DEP's Inland Water Resources Division at (860) 424-4192.

Aquifer Protection

There are no designated Aquifer Protection Areas located within one half mile of the site.

Sewer Service Area

In documents of the University of Connecticut Water and Wastewater Policy Advisory Committee, made available online at: http://www.mansfieldct.org/town/current/uconn_water_wastewater/20081218_agenda.pdf, it was determined that the application by the developer to connect to the University's wastewater system will be approved provided certain conditions are met. The recommendation by Thomas Q. Callahan, Associate Vice President of the University of Connecticut Administration and Operations Services, to the members of the University of Connecticut Water and Wastewater Policy Advisory Committee, is that "Final approval will be subject to: 1) the approval of any proposed development by Mansfield's land use authorities; 2) final approvals by both CTDPH and CTDEP of Keystone/Ponde Place's proposed well water supply systems that will be required to support the proposed new units; and 3) other technical and legal conditions required by either the Town or the University as outlined in the attached memo from UConn Director of Facilities Operation, Eugene Roberts."

Stormwater Management

Runoff from construction and post-construction activities has the potential to pollute wetlands and watercourses downstream of stormwater discharge locations. During the period of construction, the discharge of sediment, particularly during significant storm events, could occur even when non-structural and structural erosion and sediment controls are installed. Following the development's construction phase, increases in the volume and peak flow of stormwater runoff could contribute to downstream flooding and erosivity problems to the physical attributes of stream channels. Further, poorly managed stormwater can transport pollutants such as suspended solids, oil, grease and leaking automotive fluids, as well as nutrients and pesticides from inappropriate application of landscape maintenance products.

With the increase in impervious areas, new sources of stormwater pollutants are likely introduced, and some pollutants will accumulate between storm events. Rain and snowmelt pick up these pollutants and contaminants (including heat from the pavement, known as "thermal" loading), and are subsequently collected by traditional stormwater conveyance systems (e.g. catch basins and storm sewers), which are typically engineered

to quickly discharge to receiving waters. This can result in environmental pollution with adverse impacts to fish and wildlife and their habitats. Impervious surfaces such as roadways, rooftops, paved driveways, and sidewalks, also decrease the amount of precipitation that percolates through the ground to recharge aquifers which would otherwise be slowly released as base flow to streams during seasonally low-flow periods. In undeveloped areas, natural processes such as infiltration, interception, depressional storage, filtration by vegetation, and evaporation, reduce the quantity and timing of stormwater runoff and often act to reduce pollutant loads. The increased volume and velocity of stormwater runoff often exceeds the physical ability of the receiving water body to handle such flows, thereby causing flooding, erosion and sedimentation, and physically altering the aquatic habitat.

The discharge of stormwater runoff to a watercourse can have a harmful effect on the riverine system well beyond the point of discharge. These effects include:

- Increased runoff volume (as a result of less infiltration) and velocity
    - increased bank erosion and sedimentation of the river or stream channel
- Increased peak discharges (relating to the timing and magnitude of the runoff occurring from a specific storm event)
- Reduced groundwater recharge
    - reduced stream base flow
- Increased frequency of bank full and overbank floods
    - channel scour, widening, and down cutting of the receiving stream
    - stream bank erosion and increased sediment loads
    - loss of pool/riffle structure within streams (important habitat areas)
- Destruction of wetlands, riparian buffers and springs, and burying of stream substrate
    - settling of suspended sediments carried or eroded by stormwater discharges which can destroy benthic habitat, thereby impacting the food chain for fish and wildlife
- Reduction in the diversity, richness, and abundance of the stream community (aquatic invertebrates, fish, amphibians)
    - discharge of excess nutrients from lawn fertilizers, detergents, grass clippings, leaves, pet wastes, and atmospheric deposition of air-borne pollutants which can cause excessive algal growth, depleting oxygen from the water and stressing or suffocating aquatic life
    - discharge of other contaminants such as automobile oils and fluids, vehicle and tire wear, pesticides, and atmospheric deposition of air-borne pollutants which can adversely affect the aquatic ecosystem
    - impacts to the aquatic biota due to stress caused by the increased temperature of stormwater runoff
- Exacerbation of the general cumulative effect of stormwater discharges basin-wide which can alter stream morphology and dynamics, leading to increased flooding, erosion, and degraded riverine systems.

From this perspective, treating and reducing runoff from developed sites and reducing the amount of impervious surfaces, where feasible, will help to minimize surface water pollution and flooding problems caused by storm events.

Stormwater and the Eagleville Brook TMDL

Based on the Engineering Design and Drainage Report by F.A. Hesketh & Associates provided as part of the ERT materials, the estimated flows for the 2-yr and 25-yr storms are 26.8 and 54.2 cubic feet per second (cfs) respectively at North Eagleville road. This is an increase of 1.1 and 4.1 cfs for the 2-yr and 25-yr. The discharge estimated at the proposed southernmost timber road bridge post construction is increased 9.1 and 15 cfs for the 2-yr and 25-yr storm events respectively. It is evident that the flow of water off of the site is not the same as before the development.

> Is this modeled flow off the development site acceptable to the Town, considering the goal of the Eagleville Brook TMDL is an overall decrease in impervious cover (i.e. a reduction in runoff from development)?
>
> The Town is encouraged to request the developer provide a clarification of the findings and conclusions of the hydrologic and hydraulics (H&H) analysis, especially at Design Points "X" and "Z", that satisfactorily addresses this concern.
>
> The information in the Design and Drainage Report represents an analysis based on a previous iteration of the development with a different configuration of the southern grouping of buildings. It is possible that there could be changes to the anticipated flow rates in the adjacent wetlands as a result of the new placement of buildings.

Development activities have the potential to increase impervious cover, and should be constructed and operated to limit the effect of stormwater from impervious cover on the aquatic life in Eagleville Brook. Successful implementation of the Eagleville Brook TMDL will be best accomplished through incorporating an adaptive management strategy. The strategy should include 1) reducing impervious cover where practical, 2) disconnecting impervious cover from the surface waterbody, 3) minimizing additional disturbance to maintain existing natural buffering capacity, and 4) installing engineered BMPs to reduce the impact of impervious cover on receiving water hydrology and water quality. The *University of Connecticut Campus Sustainable Design Guidelines*[5], *2004 Connecticut Stormwater Manual*[6], and *Stormwater TMDL Implementation Support Manual*[7] provide good background information for new site design, as well as technical guidance for stormwater BMPs for existing sites.

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[5] JJR Smithgroup. 2004. University of Connecticut Campus Sustainable Design Guidelines.

[6] Connecticut Department of Environmental Protection. 2004. *Connecticut Stormwater Quality Manual*. 79 Elm Street, Hartford, CT 06106.

[7] ENSR Corporation. 2006. Stormwater TMDL Implementation Support Manual. 2 Technology Park Drive. Westford, MA.

Low Impact Development

The latest emphasis in stormwater management is the minimization of changes between pre- and post-development runoff rates and volumes by utilizing on-site retention/detention and to pre-treat discharges to remove total suspended solids, oils, greases, nutrients, pathogens and floatable debris. Non-structural measures to dissipate and treat runoff are strongly encouraged, including infiltration using pervious paving or through sheet flow from uncurbed pavement to vegetated swales, water gardens or depressional storage areas. The DEP recommends a stormwater management treatment train approach for many development scenarios. Such a system includes a series of stormwater best management practices (BMPs), selected for site-specific conditions, and that target the anticipated pollutants of concern. One of the most effective means to reducing stormwater runoff is to minimize impervious cover and disturbance, compaction, and vegetation removal on existing ground, first during the design stage, and then the during construction phase. The DEP recommends the treatment system be designed to treat the first inch of stormwater runoff.

In order to reduce the impact of development and address stormwater quality issues, the DEP strongly encourages the use of Low Impact Development (LID) measures, where appropriate, following investigation of on-site conditions. LID site planning principles involve controlling stormwater/snowmelt runoff volume at the source and maintaining a hydrologically functional landscape. Key strategies for effective LID include: conserving and restoring vegetation and soils, designing the site to minimize impervious surfaces, managing stormwater close to where the rain/snow falls, and providing for maintenance and education. Consequently, we typically recommend the utilization of one, or a combination, of the following measures:

- the minimization of access road widths and parking lot areas to the maximum extent possible to reduce the area of impervious surface,
- the use of pervious pavement or grid pavers (which are very compatible for parking lot and fire lane applications), *or* impervious pavement without curbs or with notched curbs to direct runoff to properly designed and installed infiltration areas,
- the use of vegetated swales, tree box filters, and/or infiltration islands to infiltrate and treat stormwater runoff (from building roofs and parking lots),
- if soil conditions permit, the use of dry wells to manage runoff from the building roofs,
- the installation of rainwater harvesting systems to capture stormwater from building roofs for the purpose of reuse for irrigation,
- proper treatment of special activity areas (e.g. loading docks, covered maintenance and service areas) and,
- providing for pollution prevention measures to reduce the introduction of pollutants to the environment.

Retaining stormwater close to its source can assist with minimizing overall site disturbance. This can be accomplished by eliminating the curbing on parking areas and

roads and using grass filter strips, grass lined swales and bio-retention areas to accommodate runoff. Swales and similar measures should be used in conjunction with (reduced size) detention basins. In rectangular parking areas, narrow (linear) vegetated stormwater retention structures can be used instead of raised vegetative strips as typically used in parking areas. Several of these techniques have been incorporated into the Ponde Place development plans as presented to the ERT Team on December 15, 2008 in order to infiltrate stormwater and attenuate peak runoff rates. The design plans show roof runoff infiltration and storage in underground galleries, bioretention areas, permeable pavement in overflow areas, and areas for overland sheet flow along with multiple discharge locations to spread flows more evenly throughout the site.

While the incorporation of these techniques is encouraging, there may be opportunities to decrease potential runoff. A key component of LID design is the utilization of the treatment train approach, whereby potentially contaminated runoff is systematically cleaned through a series of interconnected treatment units. Runoff from the parking areas must be considered along with potential pollution "hot spots" such as the dumpster locations, which can have higher pollutant levels than the surrounding pavement. The design plans indicate that the approximately 7 foot wide parking lot islands within both halves of the proposed development are to be planted with trees and grass. By converting these raised islands into depressed structures with curb cuts, there can be increased infiltration of the first flush of stormwater and decreased runoff from the site. An under drain system could be included if there is concern about their capacity to accept high precipitation runoff events. These islands would then become the first step in the treatment train with other structures following to further cleanse the runoff. The large grass area located in the center of the northern development area is also a place where additional infiltration could be incorporated. Two seven foot wide bioretention gardens could be created along the east and west sides of the field. This would require the sidewalk be repositioned, but can likely be incorporated during the current design stage.

In the southern portion of the development, the runoff reaching all 11 catch basins as well as the roof runoff from the three story building and community building is all proposed to be discharged at a single point in what appears to be an inadequately sized biofilter swale on the north side of bridge A. While the majority of the runoff is to be sent to underground galleries for storage, having all of this water enter the wetlands at one location through a small swale does not appear to be the best design. Reconfiguring the swale to run parallel to the three-story building and increasing its length should provide greater attenuation of pollutants and increased infiltration and could prevent erosion along the bridge abutment. Also, as stated previously, the proposed 2-year and 25-year storm event runoff flow rates that were calculated at the bridge location, post-construction, were 9.1cfs and 15cfs greater than modeled with current site conditions. This is the smallest swale shown on the plans and appears to be collecting runoff from the largest drainage area. Incorporating bioretention measures within the parking lot islands, if native subsoil or engineered soils allow for such, could remove a large volume of water from the storm system and help to decrease flow rates at that final discharge point. Other means of disconnecting the runoff should be considered, such as an additional swale

adjacent to the community building to receive the runoff from the two access road catch basins.

The use of best management practices to 1) reduce the amount of impervious surfaces, 2) disconnect flow paths (i.e., downspouts connected to storm sewers), and 3) treat storm water at its source all help minimize the impacts to local hydrology. Attainment of these goals can lead to the protection of water quality, reduction of impervious surfaces, increased open space, protection of trees, reduced land disturbance, decrease in infrastructure costs, and reduced homeowner energy bills (HUD, 2003). The use of Low Impact Development techniques on this property can be a valuable tool in the management of stormwater and recharge of ground water on the site. This property also has the added advantage of its close proximity to The University of Connecticut, Storrs campus where several LID projects have been completed or are underway. It would be advantageous for the developer/owner and the Town to partner with the University to assess and implement many of the LID practices suggested here and become a model for lower impact, higher density development for the entire state.

Stormwater Treatment

Stormwater treatment practices remove pollutants from stormwater through various physical, chemical, and biological mechanisms. Since many pollutants in stormwater runoff are attached to solid particles, treatment practices designed to remove suspended solids from runoff can remove other pollutants as well. Exceptions to this rule include nutrients, which are often in a dissolved form, soluble metals and organics, and extremely fine particulates that can only be removed by treatment practices other than traditional separation methods. By promoting infiltration, the volume is reduced and impacts to water quality and quantity are minimized. Thus, stormwater must be addressed with appropriate Best Management Practices.

Stormwater Quality Manual

The DEP's guidance document, the 2004 Connecticut Stormwater Quality Manual[8], provides guidance on the measures necessary to protect the waters of the state from the adverse impacts of post-construction stormwater runoff. The manual focuses on site planning, source control and pollution prevention, and stormwater treatment practices, and is intended for use as a planning tool and design guidance document by the regulated and regulatory communities involved in stormwater quality management. It also includes innovative and emerging technologies as secondary treatment practices.

The manual describes both primary treatment practices, which provide demonstrated, acceptable levels of water quality treatment, and secondary treatment practices that are not suitable as stand-alone treatment facilities but can be used for pretreatment or as

[8] Connecticut Department of Environmental Protection. 2004. *2004 Connecticut Stormwater Quality Manual*. Hartford, CT.

supplemental practices. The five major categories of primary stormwater treatment practices are:

- Stormwater ponds
- Stormwater wetlands
- Infiltration practices
- Filtering practices
- Water quality swales

Examples of secondary stormwater treatment practices described include traditional practices such as dry detention ponds, vegetated filter strips and level spreaders, oil/particle separators, and deep sump catch basins. All stormwater treatment practices should be designed, installed and maintained in accordance with the guidelines specified in the manual. For more information on how to control stormwater, this manual is now available at: http://www.dep.state.ct.us/wtr/stormwater/strmwtrman.htm.

Stormwater Construction General Permit

In addition to any local permits that would be required by the Town of Mansfield as well as site plan reviews, the proposed development would be subject to the DEP's General Permit for the Discharge of Stormwater and Dewatering Wastewater Associated with Construction Activities (see http://www.dep.state.ct.us/pao/download/watrdown/Const_GP.pdf). Furthermore, because the proposed project would result in the disturbance of ten or more acres of land (regardless of phasing) the owner or developer must register the site with the DEP thirty days prior to the commencement of construction activity and file a Pollution Control Plan ("PCP") in accordance with Section 6(b)3(C) of the General Permit. Registrants that are required to submit a PCP must pay an additional plan review fee of $500.00 besides the $500.00 registration fee.

Buffers

DEP supports and recommends the use of natural and some managed buffers to protect surface water resources from environmental impacts. Retaining a well-vegetated strip can help protect surface and groundwater quality, and fish and wildlife habitats from nonpoint source pollution. Buffers can trap road sands, contaminants and other pollutants contained in stormwater runoff generated from roadways, parking lots, roof tops, and other impervious surfaces, as well as eroded sediments occurring from natural scour or land moving activities such as site development and other soil disturbances, including farming activities. In addition to the benefits described above, riparian buffers also help moderate the temperature of stormwater runoff before it enters the watercourse, thereby reducing thermal impacts on aquatic wildlife. The riparian corridor is the area immediately adjacent to a watercourse that typically contains wetlands and acts as a

buffer to the watercourse. Riparian wetlands may additionally provide valuable wildlife habitat, flood attenuation, water quality renovation, and/or groundwater recharge. Therefore, it is important to protect these areas from degradation. A 50 to 100 foot vegetated buffer is widely employed, but widths can vary depending on such factors as topography, the erosivity of the soil, and the value or sensitivity of the water resource.

To protect riparian buffers from noise, human encroachment, and other development impacts, including stormwater runoff, the DEP's Inland Fisheries Division recommends a 100-foot buffer along perennial streams, and a 50-foot buffer zone along intermittent streams[9] measured from the upland boundary of the regulated area, including any riparian wetlands. DEP Fisheries staff further recommends that this buffer zone remain in a naturally vegetated and undisturbed condition.

To help ensure the protection of water quality and hydrologic functions in the watershed, maintaining the riparian corridor is essential. Although the applicant has shown the 100' buffer on the concept plan, this alone may not fully protect the natural resources. Often existing beyond riparian corridors are wildlife corridors. These are typically wide, linear tracts of land that allow wildlife to move freely between natural habitats containing both wetlands and uplands. The 100' buffer will assist in this goal. However, roadways can often segment these corridors resulting in wildlife habitat fragmentation, especially for smaller wildlife such as amphibians and reptiles. Site-specific roadway design choices can result in unintended consequences. For example, ordinary road curbing can obstruct passage, while Cape Cod–style curbing is more traversable by small wildlife. Sustained efforts by the town to preserve linkages amongst the wetland and watercourse complexes in this central area of Mansfield, as is underway at larger scales elsewhere in your community, will support the functional viability of wildlife corridors for a diversity of native species.

Low Impact Development and Building Efficiency

The Governor of Connecticut recently announced high performance (green) building standards, a result of broad-based energy legislation. This will require that all new State construction projects of $5 million or more and renovations of $2 million or more must meet or exceed certain energy and environmental criteria. These criteria must either meet LEED[10] Silver standards or qualify for two Green Globes using the Green Globe USA design program, and exceed energy standards set forth in the 2004 edition of the ASHRAE[11] Standard 90.1 by no less than 20%. A copy of the proposed regulation standards can be found at: http://www.ct.gov/opm/cwp/view.asp?a=2994&q=389836. Some of the criteria that are listed in the proposal to accomplish the energy efficiency goals set forth in the legislation are:

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[9] CT DEP Fisheries Division. 1991. Policy Statement – Riparian Corridor Protection; Position Statement – Utilization of 100-Foot Buffer Zones to Protect Riparian Areas in Connecticut.

[10] LEED = Leadership in Energy and Environmental Design, established by the U.S. Green Building Council.

[11] ASHRAE = American Society of Heating, Ventilating and Air Conditioning Engineers.

- Buildings be designed to be 21 percent more energy efficient that current state building code;
- Use of low-flow fixtures to consume 20 percent less water
- Appliances comply with Energy Star standards
- Use of indoor adhesives and paints low in volatile organic compound emissions
- Use of captured rainwater, recycled wastewater and drought resistant plants to cut landscaping water use by 50 percent
- At least 10 percent of building materials be manufactured within 500 miles of construction site
- Selection of a site with access to public transportation
- Reuse of sites defined as brownfields

In order to assist state and local building code officials, architects, and contractors in complying with the new State of Connecticut Regulation Section 16a-38k-1 through 9: The Establishment of High Performance Building Construction Standards for State-Funded Buildings, a manual has been created through the Office of Policy and Management and is available online at: http://www.ct.gov/opm/cwp/view.asp?a=2994&q=389836. Titled "Connecticut Building Standard Guidelines Compliance Manual for High Performance Buildings," it contains guidelines and requirements for meeting both mandatory and optional strategies to ensure compliance with the regulation. While the Ponde Place development is not a State project, it is being developed to serve a state university, and as such, should strive to represent the goals the State of Connecticut has towards environmental sustainability. Incorporating the energy efficiency strategies outlined in the Regulations, and detailed by the Compliance Manual into the final plans of the Ponde Place development, will be supportive of actions for meeting the targets established by the Eagleville TMDL analysis.[12] These regulations will enable the Ponde Place development to produce buildings that consume less energy, conserve natural resources, are more comfortable, healthier, and are easier and less costly to maintain. For more information about Connecticut's high performance building standards, or other building efficiency information, contact John Ruckes with the Connecticut Office of Policy and Management at john.ruckes@ct.gov or (860) 418-6384. The DEP Watershed Management Program can provide low impact development program assistance with Green Building resources as well as professionals versed in Green Building practices. Please contact Jessica Morgan at Jessica.Morgan@ct.gov or (860) 418-5994 for assistance.

Recommendations

The plans depict a substantial development in its use of the available land. While a detailed approach to managing the stormwater and minimizing environmental impacts

[12] State of Connecticut, Department of Environmental Protection. 2007. A Total Maximum Daily Load Analysis for Eagleville Brook, Mansfield, CT.

has been provided, additional areas of improvement can be made. Every reasonable opportunity to protect and improve water quality should be employed by the town, by the developer, and by the end users and managers of the development. One of the most effective means is to maintain vegetative buffers *in their natural state.*

In order to minimize the pollution potential from stormwater during and after construction, the following is a list of recommended management measures:

- Establish setback or buffer areas (50 feet, minimally, to 100 feet, preferably) within upland areas that are adjacent to wetlands or watercourses.
- Minimize site disturbance by limiting construction activities to areas that will contain buildings or roads. Identify special features that should be preserved (i.e. large specimen trees).
- Promote sheet flow over land to the maximum extent possible by: eliminating road and parking area curbs, utilizing pervious pavement, installing and maximizing the use of vegetative swales, employing level spreaders, increasing and lengthening drainage flow paths, and lengthening and flattening slopes, bearing in mind the goal of minimizing land grading and disturbance.
- Infiltrate stormwater discharges to the maximum extent possible to promote groundwater recharge and lessen the quantity of runoff needing (often expensive) treatment.
- Install structural stormwater management measures to treat stormwater runoff during construction. Such measures include, but are not limited to, earthen dikes/ diversions, sediment traps, check dams, level spreaders, gabions, temporary or permanent sediment basins and structures.
- Prepare a stormwater management plan, which considers both quantity and quality of runoff for the entire development site, and details the operations and maintenance of the system, a key factor for a large portion of this project, when considering the long-term viability of meeting the downstream Eagleville Brook TMDL.

If proposed, the use of a pre-fabricated stormwater treatment unit can typically remove grit, contaminated sediments, metals, hydrocarbons and other floatable materials from surface waters. However, for the price of a designed, constructed and properly installed stormwater treatment unit (which are partially effective with sediment and some nutrient/metals pollutant removal from stormwater), the applicant/town may be able to install a properly installed detention basin that addresses clean water issues and peak flow retention, reducing the impacts on the stream corridor.

Although stormwater basins are designed to control stormwater runoff and reduce peak flows, they offer limited water quality benefits. Various other treatment methods for renovating stormwater runoff include: nutrient uptake by hydrophytic vegetation, biodegradation of pollutants by microbial activity, and sediment trapping and filtration by organic or synthetic materials and vegetation. As a pre-treatment practice, it cannot be emphasized enough that infiltration should be utilized to the greatest practical extent to reduce water quantity and improve water quality.

The town land use commissions can provide visible support, targeted education and direction to the Keystone Companies and the local development community by promoting appropriate LID and better site design practices in Mansfield on a case-by-case, site specific basis. In the case of development that has some or complete activity within the water quality-impaired Eagleville Brook watershed, it is important to promote watershed goals that include reduction in effective impervious surface areas, and mimicking of pre-development site hydrology when practical. Other watershed goals should be considered from the broader perspective of well documented town land use plans, as well as from regional watershed advocates such as the Willimantic River Alliance.

CT DPH –
Public Drinking Water Supply Review

Introduction

DPH evaluated the information provided by the ERT and gathered at the site visit. DPH also reviewed applicable statutes and regulations and historical DPH files and made inquiries to other State Agencies to gather information to review this project.

The following section contains a brief history of this project with DPH, a review of the statutory and regulatory requirements for community public water systems and an evaluation of the potential environmental impacts of developing community wells in this area.

Project History

When the Ponde Place project was initially proposed in 2007, the Keystone Companies, LLC (Keystone) was in receipt of a commitment from UCONN to provide public water to this development. Since this original commitment, UCONN's current available water came under question, particularly the available water from the Fenton River Wellfield. UCONN is undergoing a study to determine the actual water that is available to its system. At this time, UCONN cannot commit to supplying additional developments with water. In a letter dated October 9, 2008, UCONN withdrew its offer to provide public water to Ponde Place.

On November 10, 2008, DWS received a Water Company Screening Application from P. Anthony Giorgio, PhD of Keystone. Dr. Giorgio indicated that Keystone proposes a 648-bed year-round residential development located at Hunting Lodge Road and Northwood Road in Mansfield. The facility will not require a subsurface sewage disposal system as they propose to connect to the University of Connecticut (UCONN) sanitary sewer system.

Keystone has provided a letter dated November 3, 2008 from Keith Nadeau, PE of Connecticut Water Company (CTWC) in which CTWC offers to own and operate the proposed new community public water system. DPH issued the determination that Ponde Place will become a new public water system in a letter dated January 30, 2009. Keystone and CTWC will be required to submit an application for a Certificate of Public Convenience and Necessity (CPCN) to the State of Connecticut Department of Public Utility Control (DPUC) for the creation of this new community public water system. DPUC and DPH have entered into a Memorandum of A greement whereby DPH reviews the technical aspects of Community Water System CPCN applications and DPUC issues the intermediate Phase Approvals and the final Certificate based on the recommendations of DPH. At the time of this report (1/30/09), the first phase application, or Phase I-A, of the CPCN for this proposed new public water supply has not been received.

Statutory and Regulatory Requirements for New Community Public Water Supply Systems

Because it has been determined that Ponde Place will become a new public water system, Keystone must submit an application for a Certificate of Public Convenience and Necessity in accordance with Connecticut General Statutes (COS) Section 16-262m. The CPCN will allow Keystone and CTWC to develop a new public water supply system to serve the proposed Ponde Place development. Keystone and CTWC must demonstrate that no feasible interconnection to an existing system is available, that the system will be designed and constructed to the engineering standards established by DPUC for public water systems, that it has the financial, technical, and managerial resources to operate a system, and that it meets all federal and state standards for water supply systems.

The first phase of the CPCN process is the Phase I-A application. One aspect of this application is to provide DPH with the information required to evaluate whether the location proposed for water supply wells is consistent with the CGS and the Regulations of Connecticut State Agencies (RCSA).

The design criteria in RCSA Section 16-262m-8(c) requires that the Ponde Place water system be designed to supply an average daily demand of 75 gallons per person or 48,700 gallons per day. Keystone and CTWC must provide applications for an adequate number of well sites which will supply the development with this amount of water with the largest producing well offline. Keystone must also provide a location for one additional reserve well.

These well sites must conform to the requirements of the following Sections of COS and RCSA:

- COS Section 25-33(b), as amended effective October 1, 2008, requires ownership or control of a new proposed water supply well's sanitary radius and that such ownership or control continue to be maintained. In other words, CTWC as the public water system owner must own or control the 75-foot, 150-foot or 200-foot sanitary radius of all proposed wells required for this development. The size of the sanitary radius is dependent on proposed well withdrawal rates. CTWC will be responsible to maintain the sanitary conditions of the associated radii by ensuring that existing or probable sources of contamination are not located within them.
- CGS Section 25-33(b) as amended also requires that a brief description of potential effects that the proposed new water supply may have on nearby water supply systems including public and private wells.
- RCSA Section 19-13-B51d requires that wells be as far removed from any known or probable source of pollution as the general layout of the premises and the surroundings will permit; and, so far as possible, be in a direction away from ground water flow from any existing or probable source of pollution.
- RCSA Section 19-13-B51d also provides minimum requirements for separating distances from known or probable sources of pollution, depending

upon proposed water withdrawal. Greater separating distances are required for certain industrial wastes or certain rock formations.

In addition, Keystone and CTWC must provide all the information required in RCSA Section 16-262m-5, for the Phase I-A applications for small community public water systems.

The design demand of 48,700 gallons of water per day approaches the 50,000 gallons of water per day withdrawal which would require a diversion permit from the State of Connecticut Department of Environmental Protection (DEP) as stated in RCSA Section 22a-377(c)-l. DPH will recommend that Keystone and CTWC consult with DEP to determine whether Ponde Place will be required to file a diversion permit application for this proposed development.

DPH will evaluate the Phase I-A application for consistency with the above noted statutes and regulations and conduct an environmental review of the surrounding area. If DPH verifies that Keystone and CTWC can develop wells which will be sufficient to supply anticipated demand and be protective of public health, Ponde Place will receive approval of Phase I-A. Keystone and CTWC will be required to submit Phase I-B and Phase II applications to DPUC for review by DPH. Keystone and CTWC must submit the necessary information required for review and approval of each phase prior to DPUC issuing a CPCN.

Potential Environmental Impacts

The proposed location of the wells as shown in the plan entitled "MA-1 Master Plan, Prepared for Ponde Place, Hunting Lodge Road, Mansfield, CT" Dated 12-04-08 is in close proximity to the Carriage House Apartments water supply (Public Water Supply Identification # CT0780181). There are private wells located along Hunting Lodge Road which also have the potential to be impacted. As a part of the Phase I-A application, DPH will require that the applicant supply an evaluation of whether development and use of the Ponde Place water supply will have adverse affects on the quantity and quality of water available to the neighboring wells.

The proposed Ponde Place well location is approximately one half mile from the UCONN landfill, and approximately 1900 feet from an area where the groundwater has been impacted from contamination due to the landfill leachate. As a part of the Phase I-A application, DPH will require that Keystone and CTWC provide an evaluation of the potential effects that contamination from the landfill will have upon the public water supply. Keystone and CTWC will be required to evaluate whether the proposed water withdrawals will have an effect on the existing leachate plume that may impact other water supply wells in the area.

Since November of 2007, Carriage House Apartments has experienced two separate routine quarterly monitoring samples that tested positive for the synthetic organic compound Di(2-Ethylhexyl)-Phthalate (DEPH). DEPH may be detected in a water sample due to contamination with plastics during the sampling and testing process or may be found in wells located near landfills [Reference: US Department of Health and Human Services, Public

Health Service Agency for Toxic Substances and Disease Registry, Division of Toxicology ToxFAQs™ Di(2-Ethylhexyl)-Phthalate (DEPH) September 2002]. DEP maintains monitoring wells in the vicinity of the UCONN landfill. According to Raymond Frigon of DEP, DEPH has not been detected in these monitoring wells.

At least two wells along Hunting Lodge Road have been identified in the past as being contaminated. Public water was extended to these sites to provide a safe supply of drinking water. Keystone and CTWC will be required to evaluate whether the proposed Ponde Place wells would be susceptible to the same source of contamination. Keystone and CTWC will also be required to provide an evaluation of the effects, if any, that increased water withdrawals will have on the probable source of contamination that has affected the above mentioned wells. Keystone and CTWC will also be required to provide an evaluation of whether increased groundwater withdrawals associated with Ponde Place could have further detrimental affects on surrounding sources of drinking water.

Conclusions

DPH has determined that Ponde Place will become a Community Public Water System. Keystone and Connecticut Water Company must submit an application for a Certificate of Public Convenience and Necessity. It will be the applicants' responsibility to submit adequate information to prove to DPH and DPUC that the proposed development of a new public water system will be done a way that is protective of public health. DPH will conduct a thorough evaluation the following items:

- In Phase I-A of the CPCN, DPH will require the applicant to submit an evaluation of the potential effects of the proposed Ponde Place wells on nearby public and private water supply wells.
- In Phase I-A of the CPCN, DPH will require the applicant to submit information sufficient to determine whether the existing conditions of the area pose a known or probable threat to the purity of the proposed public water supply.
- In Phase I-A of the CPCN, DPH will require that Ponde Place conduct and submit an evaluation of whether the existing contamination plume emanating from the UCONN landfill will affect the proposed public water supply and whether the proposed water withdrawal will impact the contamination plume.
- Connecticut Water Company as the owner and operator of Ponde Place must control the sanitary radius of each well proposed to be developed by ownership or sanitary easement. CTWC will be required to maintain each sanitary radius in a manner which protects the purity and adequacy of the sources of supply for Ponde Place.

Only when Keystone and CTWC have fulfilled all the statutory and regulatory requirements for a new community public water system, will State of CT Departments of Public Health and Public Utility Control issue a Certificate of Public Convenience and Necessity to Ponde Place.

USGS Comments

This reviewer did not see that the consultants' reports included any analysis of potential ground-water issues. Two come to mind:

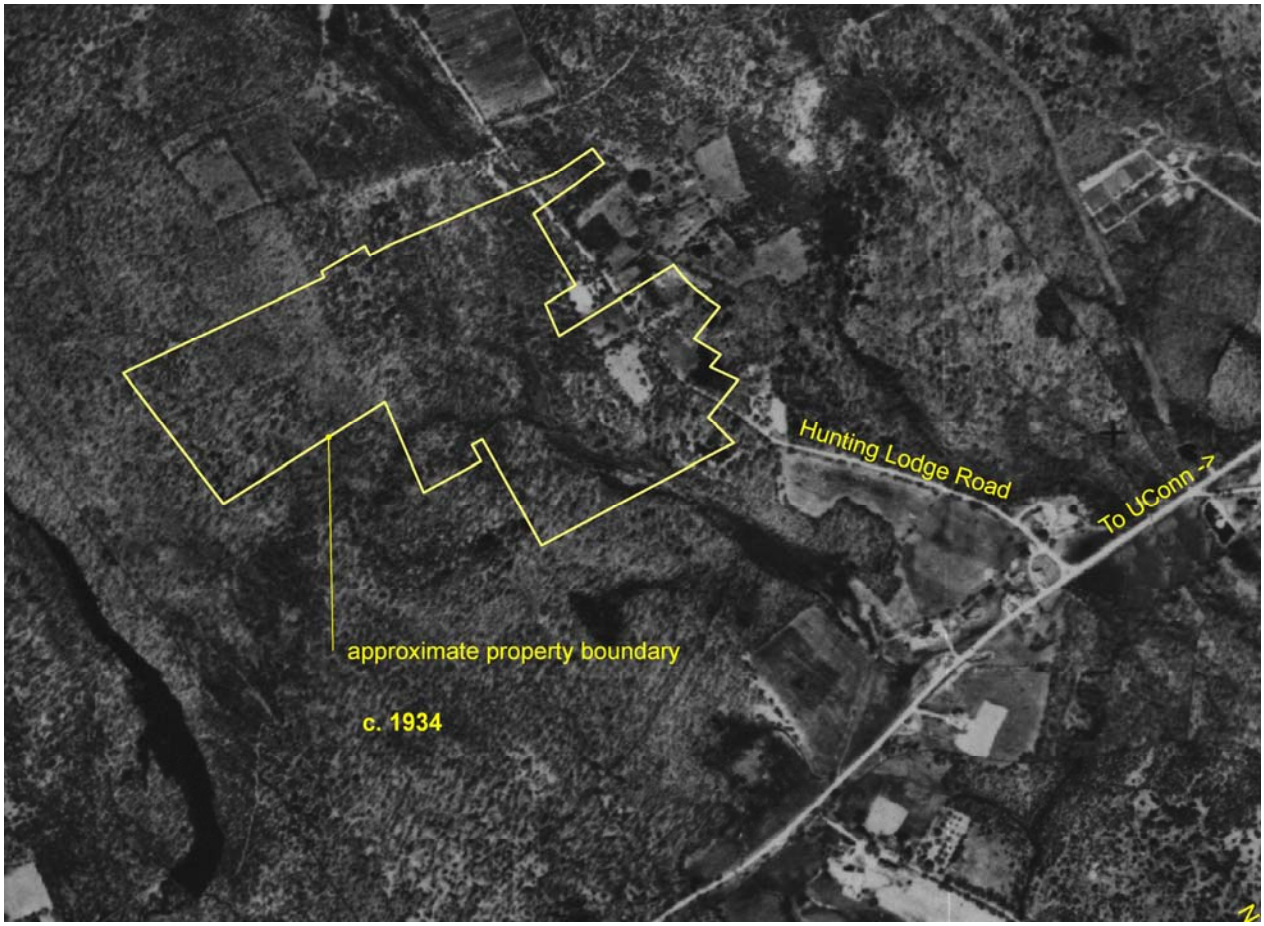
1) Will bedrock wells be able to supply water for the projected +600 residents?

2) In the past, domestic bedrock wells along Hunting Lodge Road were abandoned because they were affected by contamination from the landfill and chemical pits. More recent sampling of some of these wells indicated that the concentration of contaminants has decreased since the wells stopped pumping. This suggests that the pumping wells were pulling the contaminants to the west. The consultants should analyze whether the proposed fairly high-capacity pumping wells associated with Ponde Place again might pull the contamination to the west. The proposed wells sites are on the side of a ravine and there is a small topographic high between that area and the landfill/chemical pits area. However, flow in bedrock is not always controlled by local topography.

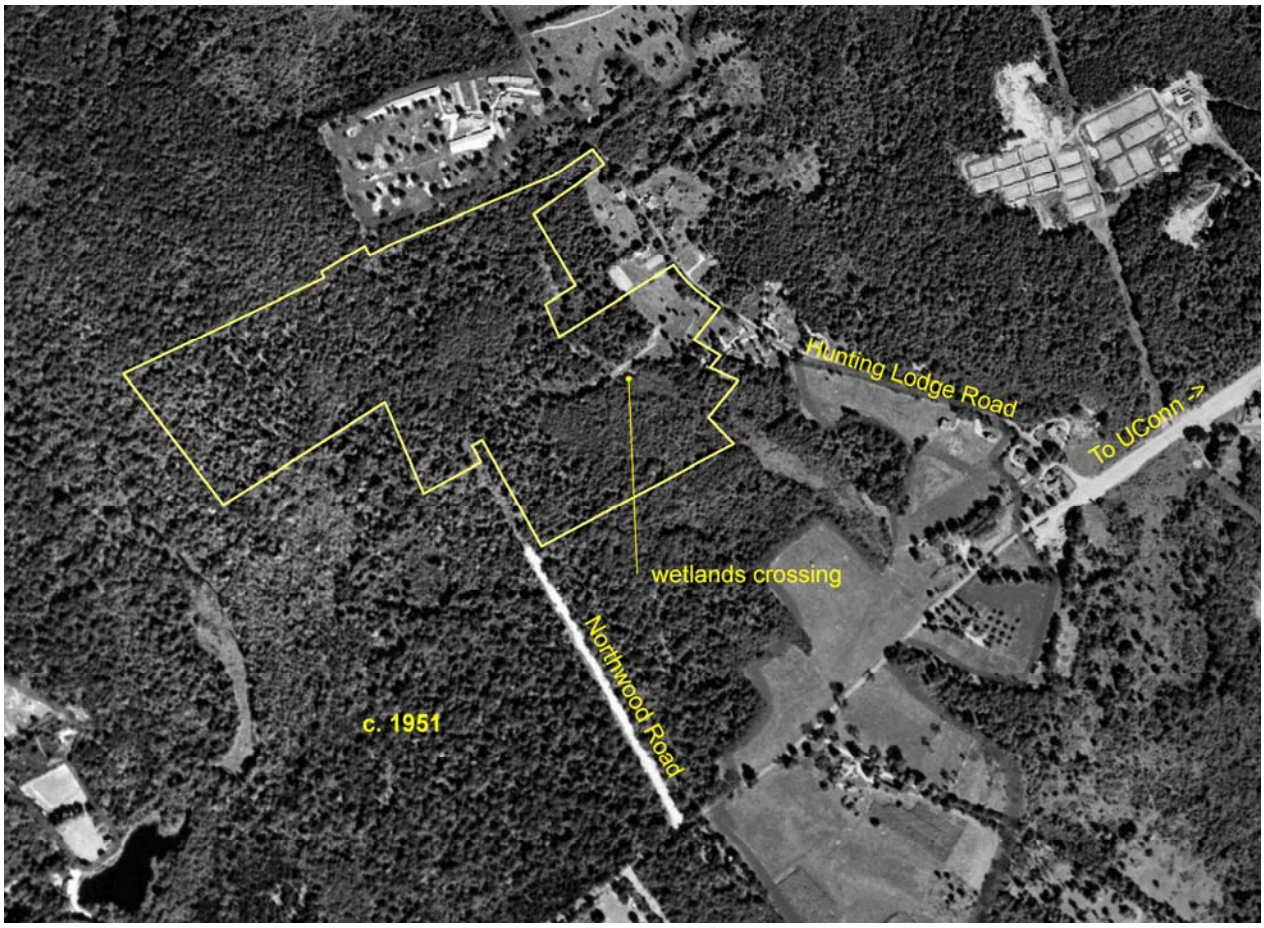
Planning and Traffic Considerations

History of the Site

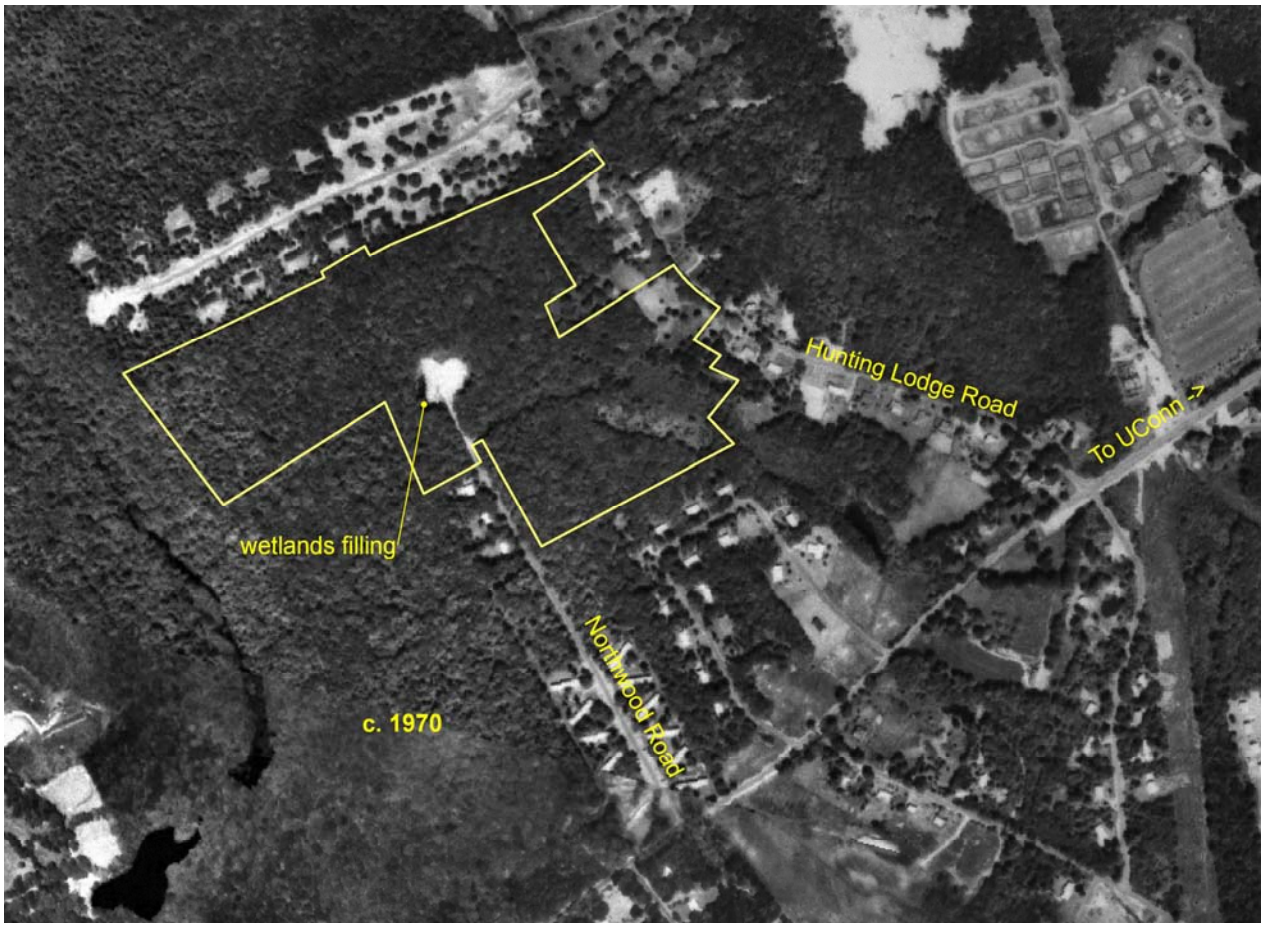
Prior to 1934, there was no apparent wetland filling or road building on the site.



A wetlands crossing is clearly visible in the 1951 aerial photo. Also, Northwood Road is constructed nearby.



Wetlands filling is apparent in the 1970 aerial photo. Neighborhood housing increases dramatically, most notably on Carriage House Road and Northwood Road.



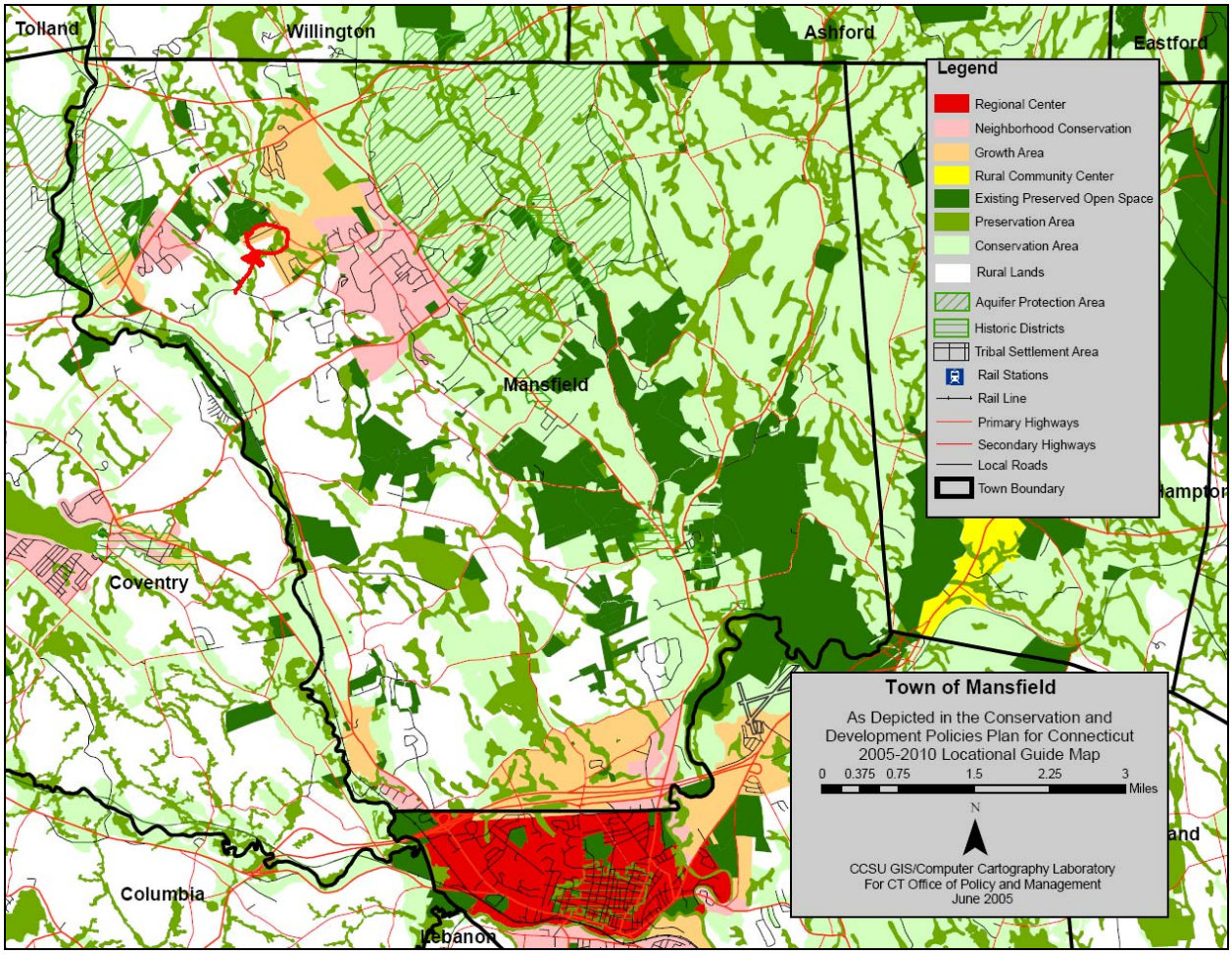
By 2004, the site has revegetated, but evidence of prior wetlands filling remains.

Consistency with State Plan

The proposed site is surrounded by orange "Growth Areas" " in the *Conservation and Development Policies Plan for the State of Connecticut, 2005-2010.* The wetlands on the property are identified as "Preservation Area" and the undeveloped, non-wetland portions of the property are classified as "Rural Lands".

The orange "Growth Areas" have public (or community) water service, sewer service connected to UConn and UConn bus transit service. The subject property meets the description of "infill development" within the Storrs Growth Area.

The general policy for "Growth Areas" is to support staged, urban-scale expansion in areas suitable for long-term economic growth.



Consistency with the Regional Plan

The proposed site is immediately adjacent to the Storrs Regional Center in the *Windham Region Land Use Plan 2002*. The wetlands on the property are classified as green "Priority Preservation Areas" the non-wetland portions of the property are classified as white "Rural Conservation Areas". The general policy for "Rural Conservation Areas" is that structural development is more appropriately located elsewhere, such as closer to the UConn Campus in Storrs. [Note: The subject property shares many characteristics with the Storrs Regional Center that is across Hunting Lodge Road.]

When development occurs in "Rural Conservation Areas", the following conservation values should be applied:

a. Minimal impact to existing topography and vegetation,
b. Limited number of curb cuts.
c. Upgrade along existing road footprints.
d. Permit new loop and through roads as appropriate. New roads should contribute to rural character by avoiding excessive widths and by creating the least possible impact on existing topography, vegetation, and existing features.

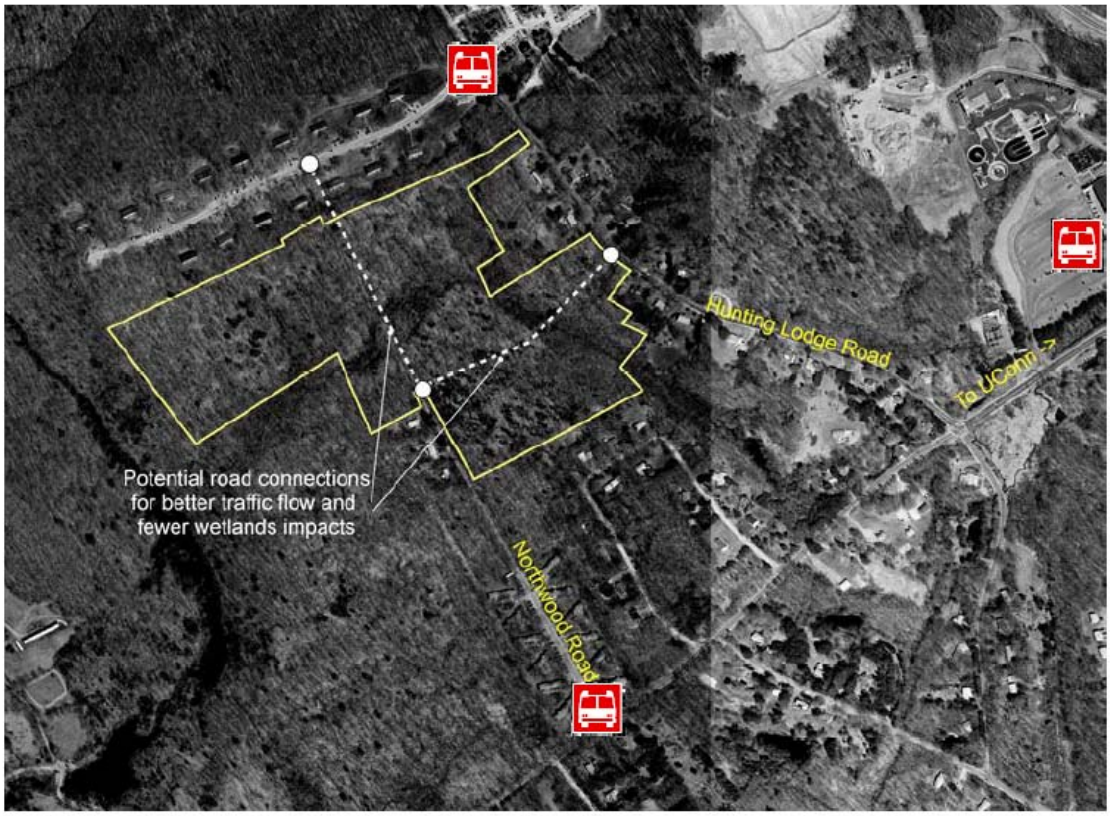
Analysis of Traffic Access/Flow

The developer of this parcel should make maximum use of the existing network of neighborhood roads and woods roads. By integrating with existing road networks, the traffic flow of the neighborhood will be improved and wetlands impact will be reduced. The white dots on the map show the best points of access to the property. The white dotted lines show potential road connections. The red signs are existing bus stops. (On the following page)

The main access to the property on Hunting Lodge Road should be as pedestrian friendly as possible to encourage use of the walking paths as well as non-vehicular commutes to the UConn campus. It should be well-lit with attractive lighting fixtures and lined with street trees. All interior walking/bike paths should have similar lighting and tree amenities. There should be convenient areas for covered bicycle and scooter storage. The developer should strive to provide attractive alternatives to student car ownership. The proposed bus stop is an excellent component of the proposed plans.

The developer should make use of the frontage on Northwood Drive to access the subject property, possibly as emergency and bus access only. Northwood Drive is currently used as: 1) a parking aisle for Northwood Apartments and 2) a de facto private road however, it is maintained as a town road. The Town of Mansfield Planning and Zoning Commission has a compelling public interest in avoiding unnecessary impacts to wetlands by using the existing road access, Northwood Drive.

Lastly, a connection to Carriage House Road would help create a more integrated transportation network and better traffic flow in the neighborhood. While this option may not be attainable at this time, the future connection to Carriage House Road should not be eliminated in the design of this site. The Mansfield Planning and Zoning Commission should request a “future right-of-way easement” that would allow space for a road connection to Carriage House Road in the future.



Overview

The proposal to create high density students quarters on the subject parcel is generally consistent with the goals of the *Conservation and Development Policies Plan for the State of Connecticut, 2005-2010* and the *Windham Region Land Use Plan.*

Traffic access and wetlands impacts are key factors in overall neighborhood and ecological impact.

The logical and orderly development of this parcel would create impacts to three private residences on Northwood Road. The following recommendations seem to provide the best methods for developing this parcel.

Recommendations

- Eliminate the northern emergency access road and wetlands crossing to Hunting Lodge Road. This access is unnecessary and will create excessive impacts to wetlands.
- Utilize existing access on Northwood Road for emergency and bus access. Make safety improvements to parking areas along Northwood Road.

- Require amenities that enhance transportation for resident bus riders, pedestrians and non-vehicular travel in order to create attractive alternatives to car ownership.
- Require a right-of-way easement for potential future road connection to Carriage House Road.

CT DOT Review

The Connecticut Department of Transportation (CT DOT) understands that the project plans are not finalized.

Pertinent issues that should be considered:

General

- The Traffic Impact Study report by F.A. Hesketh & Associates states that it is anticipated that the report and site plan will be submitted to the State Traffic Commission (STC) along with a request for a Determination.

  The STC has adopted regulations which define a development needing a certificate of operation as any which provides 200 or more parking spaces or has a gross floor area of 100,000 square feet or more, and has a driveway on a state highway or which abuts or adjoins a state highway or which substantially affects state highway traffic. For those developments which do not have a driveway on, or abut or adjoin a state highway, a determination of impact (certificate determination) must be made. In these cases, the developer is asked to submit enough information so that an evaluation of the impact on the nearest state highway intersection(s) may be made. We support this action, since the development could have an impact on nearby State Roads. A Determination would allow the Department's Traffic Forecasting Unit and the Division of Traffic Engineering to further review the application.

- The Traffic Impact Study supplies speed limit information for the roads adjacent to the site, but omits 85th Percentile speed data. This data is relevant for design, such as computing sight distance requirements and determining whether a left-turn treatment is necessary at the site driveway.

- The accident history included in the Traffic Impact Study is dated 10/1/03-9/30/06. While the accident data supplied for Route 430 is accurate, newer accident data is currently available through the Department's Traffic Accident Viewing System (TAVS) program through 12/31/07. Updated three-year accident data (1/1/05-12/31/07) for Route 430 has been included for your reference. (See following)

- According to the Department's Accident Records Section, property damage only accidents which occurred on <u>locally maintained roadways</u> (i.e. Town Roads) before August 1, 1990, from 01/01/92 - 3/31/92 and from 01/01/07 to present were coded for inclusion in the Department's accident files. Property damage only accidents which occurred on locally maintained roadways from 08/01/90 to 12/31/91 and from 04/01/92 to 12/31/06 were <u>not</u> coded for inclusion in the accident file. The Accident Records Section estimates that

accident records may increase as much as 30% when property damage only accidents are included. Therefore, accident records for the Town roads should be obtained directly from the Town of Mansfield and the data should be compared.

- A traffic control signal or a roundabout may be under consideration to replace the 4-way stop at North Eagleville Road at Hunting Lodge Road. According to Stephen Hesketh of F.A. Hesketh & Associates, there was a University of Connecticut (UCONN) study that was done that assessed the intersection from a pedestrian's point of view, and the study recommended that a roundabout be installed. However, the design of the roundabout was deemed to be too small by FHWA Design standards. The intersection is still being designed and reviewed by Hesketh, therefore we feel that commenting on the potential reconstruction of this intersection would be premature, without site plans, a cost estimate, traffic capacity analysis, etc of this intersection to review. If the site plan for Ponde Place, including the roundabout design, is sent to STC for a request for Determination, comments on the roundabout proposal may be made at that time. Because the intersection is located on a State Road, different representatives from CT DOT may be asked to review design plans for the intersection, such as Traffic Engineering, Design, Maintenance, and CT DOT's Roundabout Committee. .

Hunting Lodge Road

- Because the 85th percentile speed was not provided for Hunting Lodge Road, it was difficult to determine whether a left-turn treatment (such as a left-turn lane or a left-turn bypass lane) should be provided on Hunting Lodge Road in the vicinity of the site driveway(s). Assuming there will be one site driveway (all volume at one driveway) on Hunting Lodge Road with a design (85th Percentile) speed of 40 mph, a left-turn treatment may be warranted in the PM peak hour (accident history, right-of way availability, available sight distance and design speed are factors that must also be taken into consideration). An analysis should be conducted so as not to hinder thru movement traffic.

- Carriage House Drive contains another residential area whose traffic may orient towards the nearby UCONN campus. The spacing between the proposed site driveway and Carriage House Drive should be investigated.

- The Department agrees that the Highway Design Manual (2003 Edition or later) should be used to determine sight distance requirements. However, the 85th percentile speed is normally used for the design speed, not the posted speed limit. Without the available sight distance or design speed, we cannot determine whether the available sight distance is truly adequate. There are noticeable crests in the road north and south of the frontage at Hunting Lodge Road.

Bike/Pedestrian

- Page 7 of the Traffic Impact Report notes that there are bus stops located along Hunting Lodge Road and at the end of Northwood Road, and that some percentage of resident students will likely use these or walk to campus. Pedestrian activity on Hunting Lodge Road was observed a field review of the area on 01/6/09. It was also noted that no sidewalks currently exist on Hunting Lodge Road in the vicinity of the proposed site, but that the grading appears to be in place in anticipation of adding sidewalks. Also, it is noted that Hunting Lodge Road in the vicinity of the site is 24 ft wide with a single lane in each direction and no shoulders. Grades on the road may make it difficult to view pedestrians who are walking in the road ahead. Since 85th Percentile speeds were not provided in this study, it is not known if speeding is an issue here. Based on the latest three-year (10/1/03-9/30/06) accident data which we have provided for Route 430 (North Eagleville Road), there were no pedestrian accidents in the vicinity of Hunting Lodge Road. However, further east there were 4 pedestrian accidents (including one fatal accident). Based on these determinations, Bike and Pedestrian access should be considered in the scope of the project.

TAVS
Version 2.1

Traffic Accident Experience Report

for

ROUTE: 430 FROM: 0.00 TO 0.86

TIME PERIOD: BETWEEN 01-01-2005 AND 12-31-2007

TOTAL ACCIDENTS: 25

Time: 9:39:20 AM Date: 1/8/2009

CONNECTICUT DEPARTMENT OF TRANSPORTATION TRAFFIC ACCIDENT EXPERIENCE

25 accidents occurred on ROUTE 430 from mileage 0.00 to 0.86 between 1/1/2005 and 12/31/2007

PREPARED: 1/8/2009

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                                                                                   LIGHT       SURFACE
MILEAGE ALPHA DESCRIPTION OF ACC LOCATION    DATE OF ACCIDENT          CASE # TIME CONDITION   CONDITION  WEATHER CONDITION
                INJURY CODES:  K A B C TOT
-------------------------------------------------------------------------------------------------------------------------

TOWN:    MANSFIELD (ST
000.00  INT HILLSIDE RD                  Monday, February 28, 2005     113093 1950 Dark-Lit     Snow/SlushSnow
Collision Type:  Turning-Opp. Direction     Contributing Factor: Violated Traffic Control
At-Fault Traffic Unit: #  1
SB Automobile                     0 Injuries Maneuver: Vehicle Going Straight
NB Automobile                     0 Injuries Maneuver: Vehicle Turning Left from Proper Lane

000.01  INT OF HUNTING LODGE RD # 1      Monday, January 16, 2006      104619 1348 Daylight     Ice       No Adverse Condition
Collision Type:  Rear-end                   Contributing Factor: Following Too Closely
At-Fault Traffic Unit: #  2
EB Automobile                     0 Injuries Maneuver: Vehicle Stopped For Traffic Sign
EB Automobile                     0 Injuries Maneuver: Vehicle Going Straight

000.01  INT HUNTING LODGE RD #1          Thursday, April 06, 2006      118715 1316 Daylight     Dry       No Adverse Condition
Collision Type:  Turning-Intersecting Paths  Contributing Factor: Failed to Grant ROW
At-Fault Traffic Unit: #  2
WB Single Unit Trk/2axle/4tire    0 Injuries Maneuver: Vehicle Turning Left from Proper Lane
NB Automobile                     0 Injuries Maneuver: Vehicle Turning Left from Proper Lane

000.01  INT OF HUNTING LODGE RD # 1      Thursday, September 06, 2007  177534 1910 Daylight     Dry       No Adverse Condition
Collision Type:  Angle                      Contributing Factor: Failed to Grant ROW
At-Fault Traffic Unit: #  2
NB Automobile                     0 Injuries Maneuver: Vehicle Going Straight
WB Automobile                     0 Injuries Maneuver: Vehicle Going Straight

000.01  INT OF HUNTING LODGE RD #1       Wednesday, December 05, 2007  209932 1811 Daylight     Dry       No Adverse Condition
Collision Type:  Angle                      Contributing Factor: Failed to Grant ROW
At-Fault Traffic Unit: #  1
WB Automobile                     0 Injuries Maneuver: Vehicle Going Straight
NB Automobile                     0 Injuries Maneuver: Vehicle Going Straight

000.11  AT KING HILL RD                  Tuesday, August 30, 2005      149160 1221 Daylight     Wet       Rain
Collision Type:  Turning-Intersecting Paths  Contributing Factor: Failed to Grant ROW
At-Fault Traffic Unit: #  1
NB Automobile                     0 Injuries Maneuver: Vehicle Turning Left from Proper Lane
EB Automobile                     0 0 1 0 1  Maneuver: Vehicle Going Straight
```

CONNECTICUT DEPARTMENT OF TRANSPORTATION TRAFFIC ACCIDENT EXPERIENCE

25 accidents occurred on ROUTE 430 from mileage 0.00 to 0.86 between 1/1/2005 and 12/31/2007

PREPARED: 1/8/2009

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                                                                                   LIGHT       SURFACE
MILEAGE ALPHA DESCRIPTION OF ACC LOCATION    DATE OF ACCIDENT          CASE # TIME CONDITION   CONDITION  WEATHER CONDITION
                INJURY CODES:  K A B C TOT
-------------------------------------------------------------------------------------------------------------------------

TOWN:    MANSFIELD (ST
000.00  INT HILLSIDE RD                  Monday, February 28, 2005     113093 1950 Dark-Lit     Snow/SlushSnow
Collision Type:  Turning-Opp. Direction     Contributing Factor: Violated Traffic Control
At-Fault Traffic Unit: #  1
SB Automobile                     0 Injuries Maneuver: Vehicle Going Straight
NB Automobile                     0 Injuries Maneuver: Vehicle Turning Left from Proper Lane

000.01  INT OF HUNTING LODGE RD # 1      Monday, January 16, 2006      104619 1348 Daylight     Ice       No Adverse Condition
Collision Type:  Rear-end                   Contributing Factor: Following Too Closely
At-Fault Traffic Unit: #  2
EB Automobile                     0 Injuries Maneuver: Vehicle Stopped For Traffic Sign
EB Automobile                     0 Injuries Maneuver: Vehicle Going Straight

000.01  INT HUNTING LODGE RD #1          Thursday, April 06, 2006      118715 1316 Daylight     Dry       No Adverse Condition
Collision Type:  Turning-Intersecting Paths  Contributing Factor: Failed to Grant ROW
At-Fault Traffic Unit: #  2
WB Single Unit Trk/2axle/4tire    0 Injuries Maneuver: Vehicle Turning Left from Proper Lane
NB Automobile                     0 Injuries Maneuver: Vehicle Turning Left from Proper Lane

000.01  INT OF HUNTING LODGE RD # 1      Thursday, September 06, 2007  177534 1910 Daylight     Dry       No Adverse Condition
Collision Type:  Angle                      Contributing Factor: Failed to Grant ROW
At-Fault Traffic Unit: #  2
NB Automobile                     0 Injuries Maneuver: Vehicle Going Straight
WB Automobile                     0 Injuries Maneuver: Vehicle Going Straight

000.01  INT OF HUNTING LODGE RD #1       Wednesday, December 05, 2007  209932 1811 Daylight     Dry       No Adverse Condition
Collision Type:  Angle                      Contributing Factor: Failed to Grant ROW
At-Fault Traffic Unit: #  1
WB Automobile                     0 Injuries Maneuver: Vehicle Going Straight
NB Automobile                     0 Injuries Maneuver: Vehicle Going Straight

000.11  AT KING HILL RD                  Tuesday, August 30, 2005      149160 1221 Daylight     Wet       Rain
Collision Type:  Turning-Intersecting Paths  Contributing Factor: Failed to Grant ROW
At-Fault Traffic Unit: #  1
NB Automobile                     0 Injuries Maneuver: Vehicle Turning Left from Proper Lane
EB Automobile                     0 0 1 0 1  Maneuver: Vehicle Going Straight
```

CONNECTICUT DEPARTMENT OF TRANSPORTATION TRAFFIC ACCIDENT EXPERIENCE

25 accidents occurred on ROUTE 430 from mileage 0.00 to 0.86 between 1/1/2005 and 12/31/2007

PREPARED: 1/8/2009

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                                                                                                  LIGHT       SURFACE
MILEAGE ALPHA DESCRIPTION OF ACC LOCATION    DATE OF ACCIDENT          CASE # TIME  CONDITION   CONDITION  WEATHER CONDITION
                 INJURY CODES:  K A B C TOT
-------------------------------------------------------------------------------------------------------------------------------
TOWN:    MANSFIELD (ST
000.40  42 FT E OF AUDITORIUM RD          Friday, November 16, 2007     199326 0230 Dark-Lit     Dry       No Adverse Condition
Collision Type:  Pedestrian                  Contributing Factor: Failed to Grant ROW
At-Fault Traffic Unit: #  1
EB Automobile                     0 Injuries Maneuver: Vehicle Skidded Slowing or Stopping For Pedestrian in Road
UK Pedestrian                     0 0 1 0 1  Maneuver: Crossing Between Intersections

000.53  1000 FT E OF N HILLSIDE RD        Tuesday, December 13, 2005    174479 1018 Daylight     Dry       No Adverse Condition
Collision Type:  Rear-end                    Contributing Factor: Speed Too Fast for Conditions
At-Fault Traffic Unit: #  1
WB Automobile                     0 Injuries Maneuver: Vehicle Skidded Slowing or Stopping For Stopped Vehicle
WB Automobile                     0 0 0 1 1  Maneuver: Vehicle Stopped For Traffic

000.64  AT DR TO CHURCH PKG               Tuesday, October 17, 2006     154556 1240 Daylight     Wet       Rain
Collision Type:  Turning-Intersecting Paths  Contributing Factor: Failed to Grant ROW
At-Fault Traffic Unit: #  1
SB Automobile                     0 Injuries Maneuver: Vehicle Turning Left from Driveway
WB Automobile                     0 Injuries Maneuver: Vehicle Skidded Slowing or Stopping For Vehicle Turning Left from Driveway

000.64  AT DR TO CHURCH PKG               Tuesday, October 17, 2006     154557 2028 Dark-Lit     Wet       Rain
Collision Type:  Rear-end                    Contributing Factor: Speed Too Fast for Conditions
At-Fault Traffic Unit: #  1
EB Automobile                     0 Injuries Maneuver: Vehicle Skidded Slowing or Stopping For Stopped Vehicle
EB Automobile                     0 Injuries Maneuver: Vehicle Stopped For Turn Left

000.64  0.15 MI W OF GLENBROOK RD PVT     Saturday, January 20, 2007    983012 0141 Dark-Lit     Dry       No Adverse Condition
   F A T A L    A C C I D E N T * * * * * * * * *
Collision Type:  Pedestrian                  Contributing Factor: Failed to Grant ROW
At-Fault Traffic Unit: #  1
EB Automobile                     0 Injuries Maneuver: Vehicle Going Straight
NB Pedestrian                     1 0 0 0 0  Maneuver: Crossing Between Intersections

000.68  AT A PROJECT SERVICE RD           Thursday, March 23, 2006      116629 2006 Dark-Lit     Dry       No Adverse Condition
Collision Type:  Pedestrian                  Contributing Factor: Failed to Grant ROW
At-Fault Traffic Unit: #  1
WB Automobile                     0 Injuries Maneuver: Vehicle Skidded Slowing or Stopping For Pedestrian in Road
NB Pedestrian                     0 0 1 0 1  Maneuver: Crossing at Unsignalized Intersection
```

CONNECTICUT DEPARTMENT OF TRANSPORTATION TRAFFIC ACCIDENT EXPERIENCE

25 accidents occurred on ROUTE 430 from mileage 0.00 to 0.86 between 1/1/2005 and 12/31/2007

PREPARED: 1/8/2009

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                                                                                                LIGHT       SURFACE
MILEAGE ALPHA DESCRIPTION OF ACC LOCATION    DATE OF ACCIDENT            CASE # TIME  CONDITION   CONDITION  WEATHER CONDITION
                  INJURY CODES:  K A B C TOT
-------------------------------------------------------------------------------------------------------------------------------
TOWN:    MANSFIELD (ST
000.68  ? AT EX FR ISLANIC CTR            Friday, February 02, 2007     115837 2107 Dark-Lit     Snow/SlushSnow
Collision Type:  Fixed Object                Contributing Factor: Slippery Surface
At-Fault Traffic Unit: #  1
SB Automobile                      0 Injuries Maneuver: Vehicle Turning Left from Driveway
Object Struck: Curbing Off Road & Shoulder, Right
EB Automobile                      0 Injuries Maneuver: Vehicle Skidded Slowing or Stopping For Vehicle Turning Left from Driveway

000.69  .1 MI W OF GLENBROOK RD PVT       Thursday, March 15, 2007      124149 1628 Daylight     Wet       Rain
Collision Type:  Rear-end                    Contributing Factor: Following Too Closely
At-Fault Traffic Unit: #  1
EB Automobile                      0 Injuries Maneuver: Vehicle Skidded Slowing or Stopping For Stopped Vehicle
EB Automobile                      0 Injuries Maneuver: Vehicle Stopped For Pedestrian in Road

000.70  500 FT W OF GLENBROOK RD PVT      Wednesday, October 18, 2006   154908 0808 Daylight     Wet       Rain
Collision Type:  Rear-end                    Contributing Factor: Following Too Closely
At-Fault Traffic Unit: #  1
WB Automobile                      0 Injuries Maneuver: Vehicle Skidded Slowing or Stopping For Stopped Vehicle
WB Automobile                      0 0 0 1 1  Maneuver: Vehicle Stopped For Pedestrian in Road

000.79  AT GLEN BROOK RD PVT              Friday, March 25, 2005        117207 0105 Dark-Lit     Dry       No Adverse Condition
Collision Type:  Turning-Opp. Direction      Contributing Factor: Under the Influence
At-Fault Traffic Unit: #  1
EB Automobile                      0 Injuries Maneuver: Vehicle Going Straight
WB Single Unit Trk/2axle/4tire     0 Injuries Maneuver: Vehicle Turning Left from Proper Lane

000.79  AT GLEN BROOK RD PVT              Tuesday, March 08, 2005       117212 1439 Daylight     Ice       Blowing Sand/Soil/Snow
Collision Type:  Rear-end                    Contributing Factor: Slippery Surface
At-Fault Traffic Unit: #  1
EB Automobile                      0 Injuries Maneuver: Vehicle Skidded Slowing or Stopping For Stopped Vehicle
EB Automobile                      0 Injuries Maneuver: Vehicle Stopped For Traffic Sign

000.79  INT OF GLEN BROOK RD              Sunday, January 29, 2006      106072 1429 Daylight     Dry       No Adverse Condition
Collision Type:  Rear-end                    Contributing Factor: Following Too Closely
At-Fault Traffic Unit: #  1
EB Automobile                      0 Injuries Maneuver: Vehicle Skidded Slowing or Stopping For Stopped Vehicle
EB Automobile                      0 Injuries Maneuver: Vehicle Stopped For Traffic Sign
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CONNECTICUT DEPARTMENT OF TRANSPORTATION TRAFFIC ACCIDENT EXPERIENCE

25 accidents occurred on ROUTE 430 from mileage 0.00 to 0.86 between 1/1/2005 and 12/31/2007

PREPARED: 1/8/2009

MILEAGE	ALPHA DESCRIPTION OF ACC LOCATION	DATE OF ACCIDENT	CASE #	TIME	LIGHT CONDITION	SURFACE CONDITION	WEATHER CONDITION
	INJURY CODES: K A B C TOT						

TOWN: MANSFIELD (ST

000.81 80 FT E OF GLENBROOK RD — Friday, September 16, 2005 — 154487 — 1412 — Daylight — Dry — No Adverse Condition

Collision Type: Rear-end — Contributing Factor: Following Too Closely

At-Fault Traffic Unit: # 1

EB Automobile — 0 Injuries — Maneuver: Vehicle Going Straight

EB Automobile — 0 Injuries — Maneuver: Vehicle Stopped For Traffic

Appendix

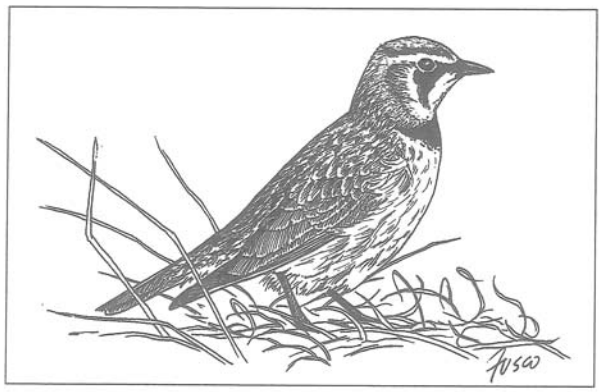
Horned Lark
Northern Spring Salamander
Wood Turtle

WILDLIFE IN CONNECTICUT

ENDANGERED AND THREATENED SPECIES SERIES

HORNED LARK

Eremophila alpestris



Habitat: Large fields, open areas, shoreline beaches, grasslands, and agricultural areas.

Weight: Males, 1.13 ounces; females, 1.08 ounces.

Length: 7-8 inches.

Wingspan: 12.25-14 inches.

Life Expectancy: Unknown; however, banded skylarks (from the same family) have reportedly lived over 8 years.

Food: Weed seeds, waste grains, caterpillars, ants, wasps, grasshoppers, leafhoppers, and spiders.

Status: State threatened.

Identification: The brownish horned lark is best identified by its very distinctive head pattern: black "horns" (feather tufts), a white or yellowish face and throat, a broad, black stripe under the eye, and a black bib. The female is duller overall than the male and the horns are less prominent. In flight, the most obvious characteristic is the mostly black tail with white outer feathers. In winter plumage, the black areas on the head and breast are partially obscured by pale edgings. The horned lark is larger than a sparrow.

Range: In North America, the horned lark nests from Alaska and Canada south to West Virginia, North Carolina, Missouri, Kansas and coastal Texas. It winters along the Gulf Coast.

Reproduction: The horned lark nests in large, open areas that are barren, sandy, stony, or have sparse grass cover. In Connecticut, the horned lark nests on beaches and open areas, mostly along the coast. Breeding has also been documented in grassland areas at airports. Breeding usually begins in mid-June. The cup-shaped nest is built on the ground in a shallow depression, usually in the shelter of a plant tuft or stone. The nest is made of dry grass and plant stems, loosely put together, with a fine inner lining of plant down and hair. Small pieces of peat or pebbles may be assembled around the nest or on one side of it. The 4 smooth, glossy eggs are pale greenish-white and heavily speckled with fine buff-brown; there is often a blackish hairline. The eggs are laid at daily intervals and incubated by the female for 10 to 14 days. After hatching, the altricial (helpless) young have brown skin and long, pale down. They are cared for by both adults and leave the nest after 9 to 12 days.

Reason for Decline: Horned lark populations have steadily declined as dry, open uplands have reverted to forests or have been destroyed by development. As with

other ground-nesting birds, high populations of predators, such as raccoons, skunks, and housecats, have also contributed to the decline of this species.

History in Connecticut: Horned larks are common migrants and winter visitors in Connecticut, but are rare nesters. When eastern forests were cleared for agriculture, a western subspecies, the "prairie" horned lark (*E. a. praticola*), expanded its range eastward and was first reported nesting in Torrington, Connecticut, in 1891. Through the early 1900s, horned larks expanded their nesting areas south through Litchfield County. Scattered nesting occurred throughout Connecticut and the number of nesting pairs was never very high. As agricultural practices changed and development increased, horned lark nesting decreased and a population decline was noted for the Northeast.

Interesting Facts: The horned lark is known for the way it travels; it walks instead of hopping and sings from any slight elevation on the ground. The song, a clear "tsee-ee," is irregular, high-pitched, and often prolonged.

In its courtship flight, the male horned lark quietly ascends 300 to 800 feet or more above ground and begins a high-pitched, tinkling flight song as it circles. When the song ends, the lark drops headfirst, with closed wings, waiting until it almost crash-lands, before opening its wings and pulling out of the dive.

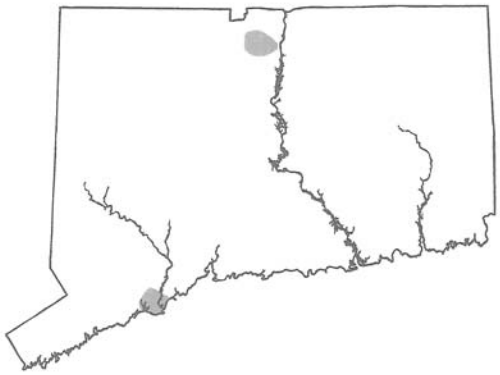
The claw on the hind toe of the horned lark is long and straight. This "larkspur" is characteristic of members of the lark family.

Many of the horned lark's regional names reflect its favored habitat: prairie bird, shore lark, road lark, and wheat bird. Even its genus name, *Eremophila*, is Latin for "desert-loving," further illustrating this bird's fondness for bare, open ground.

Protective Legislation: *Federal* - Migratory Bird Treaty Act of 1918. *State* - Connecticut General Statutes Sec. 26-311.

What You Can Do: Protection of open grassland and agricultural areas is essential to conserving breeding populations of horned larks. Maintaining fields, both inland and along Connecticut's coastline, and keeping a safe distance from horned lark nests will help protect this species.

Connecticut Range

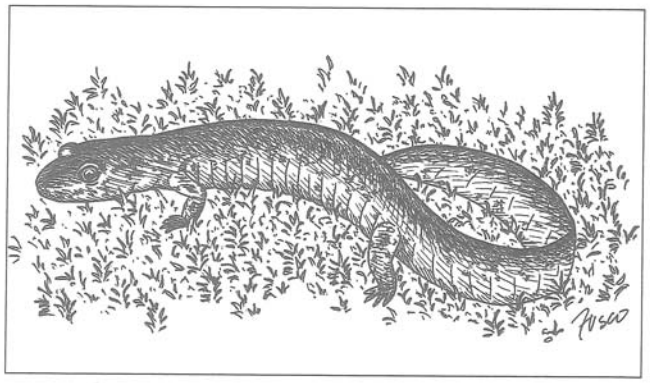


WILDLIFE IN CONNECTICUT

ENDANGERED AND THREATENED SPECIES SERIES

NORTHERN SPRING SALAMANDER

Gyrinophilus porphyriticus



Habitat: Cool and well-shaded mountain springs at high elevations, and wet depressions beneath logs, stones, or leaves in surrounding forests.

Weight: Unknown.

Length: Adults, 5.5-7.5 inches; females are usually smaller than males.

Life Expectancy: Unknown, but greater than five years.

Food: Insects, crustaceans, centipedes, millipedes, earthworms, snails, spiders, and occasionally small frogs and salamanders.

Status: State threatened.

Identification: The spring salamander is one of the larger salamanders, with a stout body and a broad nose that ends abruptly. Its back and tail are light brownish-orange or salmon-red with small dark spots or flecks. A light line, bordered below by a dark line, begins at the eye and extends to the nostril. The belly is flesh-colored and the throat may be flecked with black. The tail has a prominent, knife-like keel on the top, which enables this salamander to swim in swift-moving water.

Range: The spring salamander is found from southwest Maine and southern Quebec to northern Alabama.

Reproduction: Unlike many of Connecticut's other large salamanders, which breed in the spring, the spring salamander breeds from mid-October through the winter months. During courtship, the male and female push each other and roll around in the water. The male deposits sperm, which is picked up and stored by the female until the eggs are laid from April through the summer. Between 9 and 144 eggs (average 40-60) are laid in running water under logs and stones, usually in groups or sometimes attached singly. The female guards the eggs, which hatch in late summer or early fall. The larval salamanders may remain near the nest site for several months after hatching and appear ghostly white with a purplish cast for up to 3 years. Females do not breed until they are about 5 years old.

Reason for Decline: Intensive development pressure throughout this salamander's range has caused disruption of many natural cold water springs. The loss of woodlands surrounding these springs has allowed water

temperatures to rise, making the springs unsuitable for these salamanders. Pollution, degradation, and siltation of streams have also contributed to the decline in the spring salamander population.

History in Connecticut: Small populations of spring salamanders are scattered throughout the state. Long-established breeding populations are documented as declining and are considered likely to disappear unless special action is taken.

Interesting Facts: Spring salamanders are primarily nocturnal. They forage for food around rocks and vegetation in or along stream beds, and have been known to eat their own larvae.

The salamander spends the winter months in wet soil close to a source of water, where it remains somewhat active in burrows.

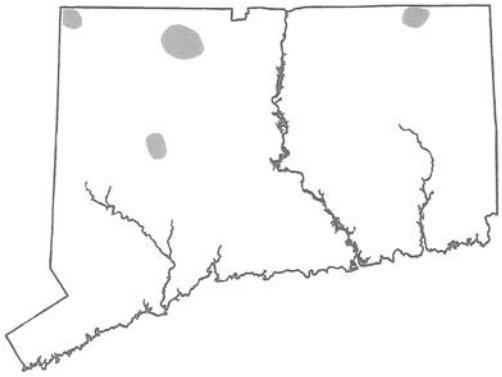
The purple color of young spring salamanders led to its former name, the purple salamander.

Protective Legislation: *State* - Connecticut General Statutes Sec. 26-311.

What You Can Do: Protection of cold forest streams and springs is essential to maintaining spring salamander habitats. Projects that help restore shade trees and shrubs along stream banks will help water temperatures remain suitable for this salamander.

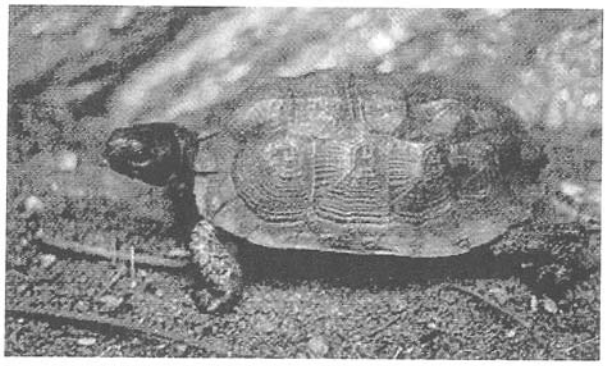
Spring salamanders may not be collected from the wild. They do not make good pets and keeping them in captivity is illegal. Preventing illegal collection of these salamanders will help protect native populations.

Connecticut Range



Connecticut Department of Environmental Protection
Wood Turtle

(Clemmys insculpta)



IDENTIFICATION: A medium-sized turtle, readily distinguished by its sculptured, rough, moderately-domed carapace, black head, orange-red wash on its under limbs, and a yellow plastron with black squares along the edges. Adults 150-200 mm carapace length.

In contrast to Connecticut's other turtle species, the wood turtle is an animal of the northern forest biome, from the Great Lakes eastward through New England and northeastern Canada. Its southern range limit lies near Washington, DC. In Connecticut, the strongholds of wood turtle distribution are the eastern and western uplands. Although once quite common in the Central Connecticut Lowland, many populations have been reduced or even eliminated by habitat fragmentation. This species was never common in the coastal zone of the state. Wood turtles have extensive landscape-scale habitat requirements, requiring clean rivers and large streams with deeply undercut banks for hibernation, as well as extensive areas of floodplain, forest, and fields for summer foraging. Because of their extensive overland movements, they are very susceptible to road mortality. They take over a decade to reach sexual maturity, and have a low egg output, and limited juvenile survivorship. Loss of adults from breeding populations, whether from increased road mortality or by collection for the wildlife trade, is a major problem affecting the sustainability of wood turtle populations in Connecticut. Possession of any wood turtle is prohibited (Conn. Code Sec. 26-55-3-C) in Connecticut without regard to its origin, and collection within Connecticut is prohibited (Conn. Code Sec. 26-66-14-A). The wood turtle is a "Special Concern" species in Connecticut. International commerce in wood turtles posed such a threat that in 1992 this species was placed under international trade regulatory protection administered by CITES (Convention on International Trade in Endangered Species of Flora and Fauna). The wood turtle is of conservation concern throughout most of its range. Most states and provinces where it occurs afford it special status and/or some form of statutory protection.

Turtles | Amphibians and Reptiles in Connecticut

About The Team

The Eastern Connecticut Environmental Review Team (ERT) is a group of professionals in environmental fields drawn together from a variety of federal, state and regional agencies. Specialists on the Team include geologists, biologists, foresters, soil specialists, engineers and planners. The ERT operates with state funding under the supervision of the Eastern Connecticut Resource Conservation and Development (RC&D) Area — an 86 town region.

The services of the Team are available as a public service at no cost to Connecticut towns.

Purpose of the Team

The Environmental Review Team is available to help towns and developers in the review of sites proposed for major land use activities. To date, the ERT has been involved in reviewing a wide range of projects including subdivisions, landfills, commercial and industrial developments, sand and gravel excavations, active adult, recreation/open space projects, watershed studies and resource inventories.

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 project site and highlighting opportunities and limitations for the proposed land use.

Requesting a Review

Environmental reviews may be requested by the chief elected official of a municipality and/or the chairman of town commissions such as planning and zoning, conservation, inland wetlands, parks and recreation or economic development. Requests should be directed to the chairman of your local Conservation District and the ERT Coordinator. A request form should be completely filled out and should include the required materials. When this request is reviewed by the local Conservation District and approved by the ERT Subcommittee, the Team will undertake the review on a priority basis.

For additional information and request forms regarding the Environmental Review Team please contact the ERT Coordinator: 860-345-3977, Eastern Connecticut RC&D Area, P.O. Box 70, Haddam, Connecticut 06438, e-mail: connecticutert@aol.com.