Chatfield Farms II
Active Adult Community
Beacon Falls, Connecticut

King's Mark
Environmental Review Team Report

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

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Active Adult Development
Beacon Falls, Connecticut

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Prepared by the
King's Mark
Environmental Review Team

Of the

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

For the

Conservation Commission
Beacon Falls, Connecticut

June 2006/July 2006

Report #338

ACKNOWLEDGMENTS

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

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

The field review took place on Tuesday, may 16, 2006.

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I would also like to thank Edward Jurzynski and Richard Minnick, conservation commission, John Smith and David Moran, inland wetlands commission, Jim Galligan, Nafis and Young, engineer for the town, Darin Overton and William Root, Milone and MacBroom, project engineer and consultant, Anthony Silu, Aurora Estates, project applicant, David Elder, planner, Valley Council of Governments, and David Rempt, citizen, for their cooperation and assistance during this environmental review.

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

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

The King's Mark RC&D Executive Council hopes you will find this report of value and assistance in the review of this proposed active adult development.

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Introduction

Introduction

The Beacon Falls Conservation Commission has requested Environmental Review Team (ERT) assistance in reviewing a proposed active adult community.

Chatfield Farms II is an extension of an approved 235 unit active adult development known as Chatfield Farms I. An ERT report was conducted for that project in 2004.

The two parcels for Chatfield Farms II total +135 acres and are zoned R-1. The site is located to the east of Chatfield Farms I along the Bethany town line in the southeast corner of town. An unimproved portion of Miller Road extends to the south of the site, Blackberry Hill Road is about 1200 feet north of the northern property boundary and an unimproved section of Bear Hill Road runs along the eastern property boundary. The Beacon Heights landfill superfund site is adjacent to the property.

The project proposed the construction of 316 units (single family homes and four unit buildings) of age restricted housing. The proposed private roadway system will connect to the roadway system in Chatfield Farms I and extend through the site to the cul-de-sac in the yet to be constructed Oakwood Estates Subdivision. There will be 12,500 feet of new roadway constructed. The plan show 41.5 acres of open space protected by conservation easement.

Objectives of the ERT Study

The conservation commission has requested the ERT to assist in a review of this project so that all town commissions and boards will be to properly evaluate the project and information pertaining to the impact, positive and negative, that this project may have on the welfare, safety and environment of Beacon Falls. Major concerns include: soils,

topography, geology, hydrology, stormwater management, wetlands, water quality, proximity to a superfund site, land use, site design, traffic and access, and open space.

The ERT Process

Through the efforts of the Beacon Falls Conservation Commissions this environmental review and report was prepared for the Town of Beacon Falls.

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

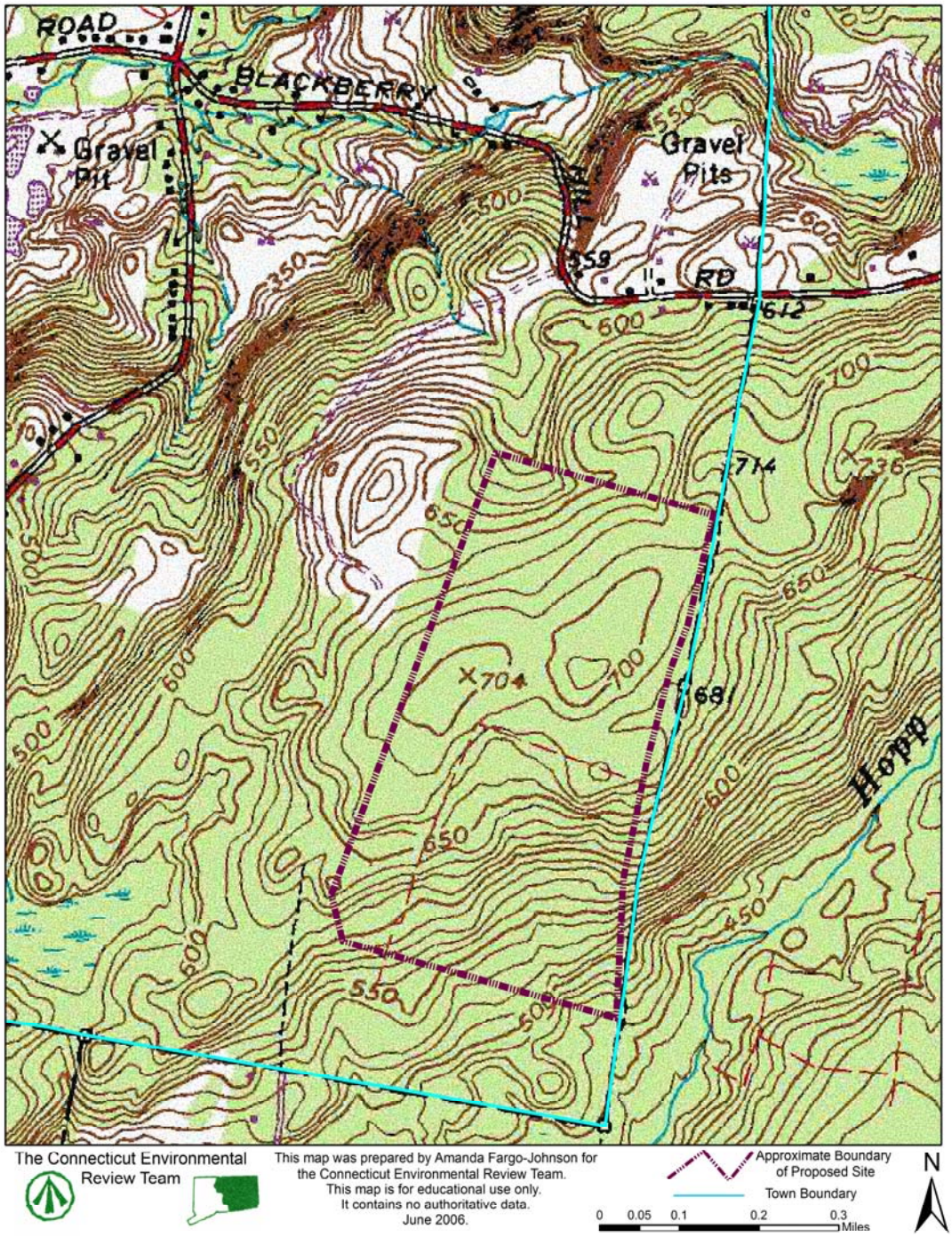
The review process consisted of four phases:

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

The data collection phase involved both literature and field research. The field review was conducted Tuesday, May 16, 2006. The emphasis of the field review was on the exchange of ideas, concerns and recommendations. Being on site allowed Team members to verify information and to identify other resources.

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

Chatfield Farms II Site Location



Chatfield Farms II Aerial Map

Topography and Geology

Topography

Most of the Chatfield Farms development is being constructed in an area containing broad-topped rolling hills with rather steep sides that drop off into stream valleys (e.g. the southward flowing Hopp Brook just to the east of the parcel). Most of the development is proposed on the ridge-line, i.e. the high part of the parcel with the gentlest topography. Hill-top elevations are greater than 700' (it is purportedly the highest area in Beacon Falls) whereas the valley bottom of Hopp Brook is on the order of 450' elevation: relief is greater than 200'. Because the development avoids the steep slopes, topography does not seem to pose any limitations.

Geology

Although soils are thin in the area, very few exposures of local bedrock are found on the parcel. The rocks of the area have been referred to as the Hartland Formation by Carr (1960) or as the Golden Hill Schist (Rodgers, 1985), thought to be Ordovician in age (~450-500 million years). Rocks seen, during the field visit, in scattered outcrops surrounding the parcel consist of light gray and dark gray foliated gneiss (Fig. 2). The gneiss is composed of quartz, sodium-rich plagioclase-feldspar, and biotite mica. Dark gray vs. light gray depends on the abundance of quartz and feldspar. Some layers, rare, consist solely of quartz and feldspar and are white to very light gray in color. The rock is poorly fractured except close to the surface where surface parallel exfoliation fractures are seen. These are close spaced at the surface (Fig. 3), but become more widely spaced with depth, even on an outcrop. They tend to produce angular cobble and boulder sized fragments when broken from the outcrop (Fig. 4 and 5).

Carr (1960) mapped a series of tight NE-SW trending folds in the area. Although no folds were seen during the field inspection the variable attitudes of foliation seen (compare Fig. 2 and 3) are probably a result of the rocks being folded. The folds are cut

be southeast dipping normal faults, along one of which basaltic magma intruded about 180 million years ago (Jurassic Period) creating a dike and feeding surface lava flows (faulting and magma production are no longer active). The steep sided valleys in the area are likely the result of the enhanced erodability of fractured and faulted rocks.

Notable is the very thin soil across the area. Figure 6 is a map showing an interpretation of the soil thinness on the parcel based on test-holes dug by the applicant. This interpretation is reinforced by field observations (Figures 4 and 5) of many areas with angular exfoliated gneiss slabs that are not far from the outcrop. Flint (1978) shows the entire parcel covered by a thin (10' or less in thickness) veneer of till that was deposited by glaciers during the last Ice Age.

Thin soils will pose a problem to development. In some areas blasting may be needed for basements and to adequately bury utilities. Fill may need to be imported to build up adequate road beds.

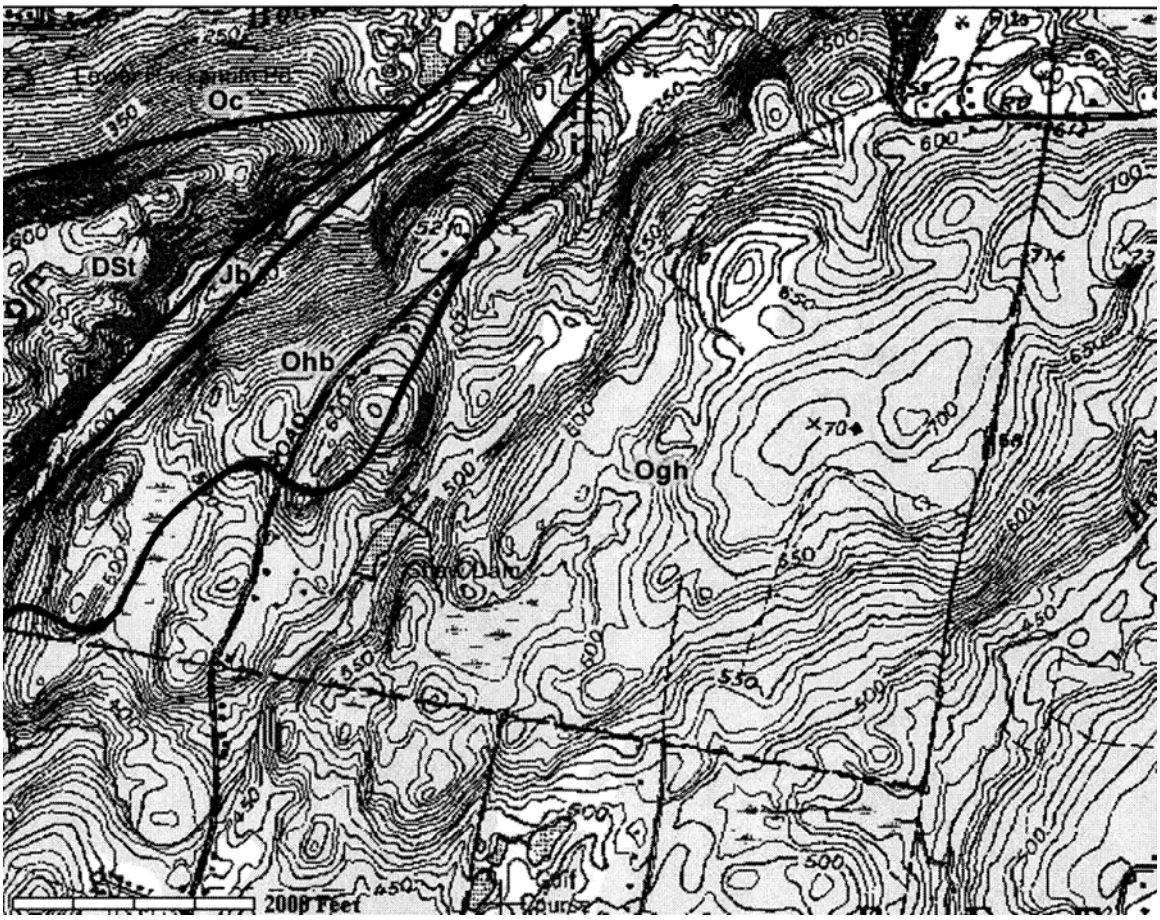
Several upland vernal pools are found in some areas were bedrock was scoured into saucer-like depressions by the glaciers. The thin till does not completely fill these depressions and the poorly fractured bedrock impounds seasonal waters forming the ephemeral pools.

References

Carr, M.H., 1960, Geologic Map of the Naugatuck Quadrangle, Connecticut. CT Geol. and Nat. Hist. Surv, Quad. Rpt. #9

Flint, R.F., 1978, Surficial Geologic Map of the Naugatuck Quadrangle, Connecticut. CT Geol. and Nat. Hist Surv. Quad. Rpt. #35, 23p.

Rodgers, John, 1985, Bedrock Geologic Map of Connecticut. Connecticut Geol. And Nat. Hist. Survey, Atlas Series: Bedrock Geologic Map.



Geologic Map of Phase I and Phase II

Figure 1. Bedrock geologic map of Phase I and Phase II. Jb=Jurassic-aged basalt; DSt=Straits Schist of Silurian-Devonian age; Oc=Ordovician-aged Collinsville Formation; Ohb=Ordovician Beardsley Member of Harrison Gneiss; Ogh-Ordovician-aged Golden Hill Schist. Only the Golden Hill Schist underlies the Phase II parcel. It is described by Rodgers (1985) as grey to silvery, medium- to coarse-grained schist and granofels. Map is digitized version of Rodgers, 1985, provide the Department of Environmetal Protection.

Figure 2. Light and dark gray gneiss exposed in unimproved roadway immediately north of parcel. Foliation at t his outcrop is steeply dipping. Light areas consist of feldspar that is slightly elongate (in plane of foliation). Feldspar is surrounded by quartz and biotite mica. Dark layers contain more biotite and less quartz and feldspar.

Figure 3. Outcrop just north of northern boundary of parcel, consisting of gray foliated gneiss with thin schist folia. Rock breaks into angular slabs visible in immediate foreground. Note the paucity of high angle fractures.

Figure 4. Broken fragments of grey gneiss that is angular and rather slabby. None of the fragments was attached to the ledge, but none was far from the outcrop from which it was broken: soil is very thin in this area. Located in south flowing drainage and wetland near location where sewer will cross the wetland.

Figure 5. Typical area on ridge-top showing abundant angular slabby fragments of bedrock that are inferred to be sitting on very thin soil: i.e. ledge is close to the surface.

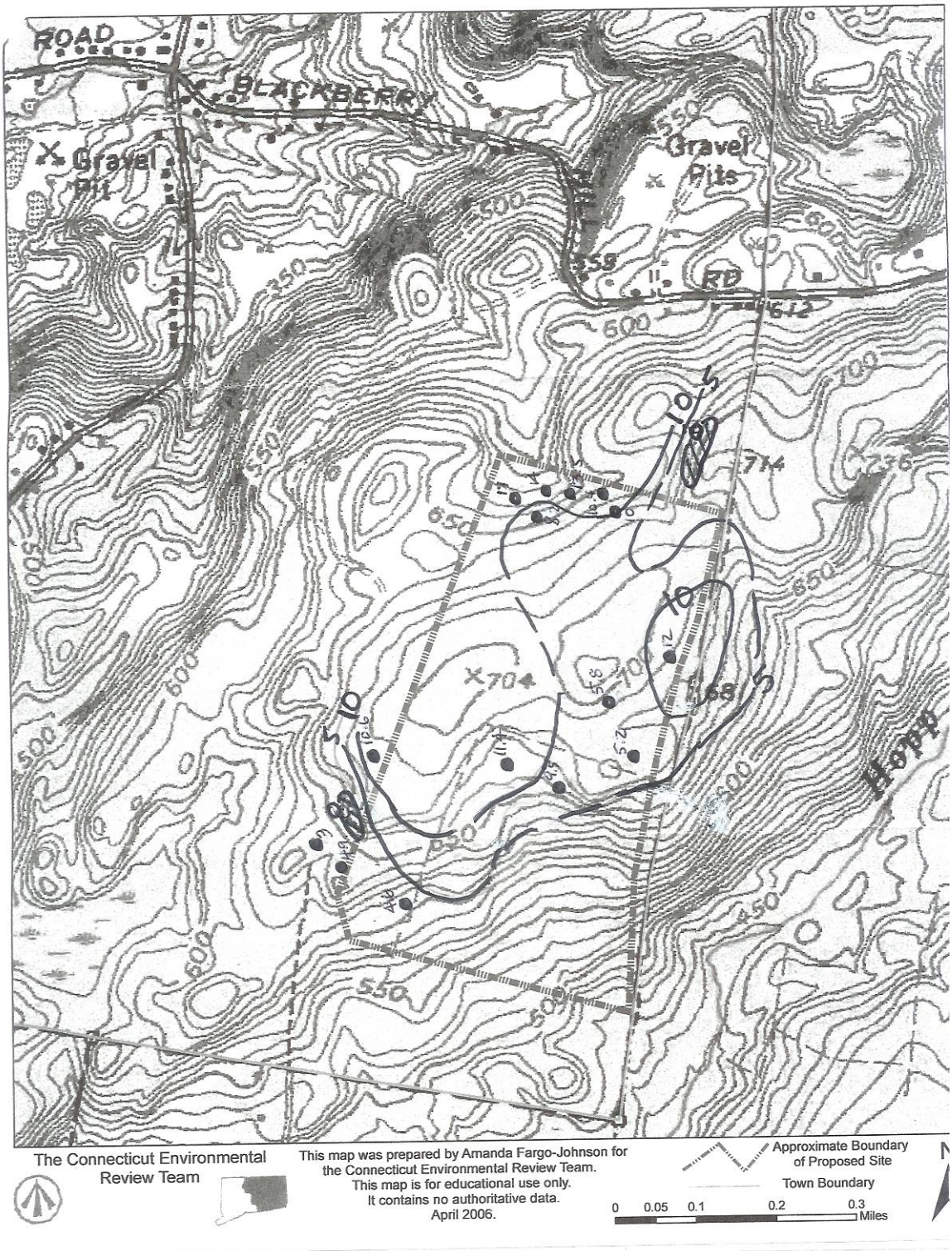


Figure 6. Isopachous map showing soil thickness over parcel, based on boring logs of developer. Location of parcel boundaries is approximate as is location of test borings. Map is intended to illustrate the potentially large area of thin soils. Data are scant for most of the area and hence this map should note used for engineering purposes. More test borings would enhance the reliability of the interpretation.

Southwest Conservation District Review

Materials Referenced

The materials provided to all ERT members at the meeting of May 16, 2006 which included project plans, wetland impact assessment report and the engineering report. Fiver Year Review Report – Third Five-Year review report for the Beacon Heights Landfill Superfund Site Beacon Falls, Connecticut; September 2003. United States Environmental Protection Agency Region 1 Boston Massachusetts. New Haven County Soil Survey. USDA NRCS Soil Data Website http://www.soils.usda.gov/ . The Surficial Geology of the Naugatuck Quadrangle with map, Richard Foster Flint 1978. State Geological and Natural History Survey of Connecticut, Department of Environmental Protection. Chatfield Farms Active Adult Community Beacon Falls, Connecticut; King's Mark Environmental Review Team Report, July 2004. Buffer Zones and Beyond; Lynn Boyd, Wetland Conservation Professional Program Department of Natural Resources Conservation, University of Massachusetts. July, 2001. Central Naugatuck Valley Regional Plan of Conservation & Development, 1998. Beacon falls Town of Development Preliminary Draft for Discussion, 2002. Best Development Practices Conserving Pool-Breeding Amphibians in Residential and Commercial Developments in the Northeastern United States. Calhoun and Klemens, 2002).

After reviewing the above referenced materials the following observations, comments and recommendations are offered. These recommendations are advisory in nature and are intended to assist Naugatuck in managing natural resources.

Note: The Chatfield Farms I Active Adult Community King's Mark Environmental Review Team Report (7-04, report # 325), page eight through twenty seven is attached for review as many of the conservation issues addressed in that report apply to this site as well. These pages are submitted with this section as **Attachment 2 (found in the Appendix).**

1. **Development Proposal Information**. In order to effectively review this development proposal it is suggested that the following specific information be provided as part of the application, if not already provided. Also it is recommended that the development proposal information include a copy of the Connecticut Stormwater Quality Manual Draft Worksheet for Use with New Land Development. (May be found at the end of this section.) If that format is followed, it is easier for commissions to determine the consistency of the proposal with similar land development proposals and it provides a consistent format that assures all desired information is provided. In addition, the following information should be provided as part of this development proposal:

- Clarify location of soil test pits as indicated in the engineering report. (Note: This information was requested from Milone and Macbroom and provided to the Southwest Conservation District on May 31, 2006).
- Information on soils, surface and bedrock geology for the drainage area upslope from the landfill remediation area and groundwater related records concerning the landfill site for review by a certified hydrogeologist.
- A study of the wetlands on site to determine the extant and quality of the wetlands, utilizing an acceptable monitoring protocol to determine if there are viable breeding communities of spotted or marbled salamanders and or box turtles and or other important flora or fauna species. This study must include an assessment of upland habitats required of the species determined to inhabit the site.
- A review of the approval of and development activities to date on the previously reviewed Chatfield Farms I project.
- Provide the area of developable vs. undevelopable land in acres.
- Provide a number indicating the percentage of total impervious surface post development.
- Provide landuse information to 500 feet from the property line including topographic and hydrologic data.

2) **Protecting Resources –Watershed Perspective**. The Conservation Districts have recently "officially" shifted their mission to include a watershed based planning perspective. This in part is in recognition that protecting soil and water resources in particular cannot be effectively completed at the site level planning process.

Considering the proposed development of the Chatfield Two site, the best means for protecting the natural resources of this as well as adjoining (and particularly downstream

resources) would be to not develop the site at all. New development instead should be concentrated in town centers, convenient to public transportation and other infrastructure - upper watershed development should be in general, minimized, and when it does occur densities should be minimized.

The impacts of developing high-density residential projects in rural areas include, but are not limited to:

- Water quality in a watershed is directly related to the percentage of impervious surface. Upper watershed development contributes to degraded water in the upper watershed where water is typically utilized for purposes such as drinking water supply, streams sensitive to environmental changes such as trout streams, etc.
- Housing away from town centers increases vehicle trips – traffic, air pollution, noise, use of non-renewable resources (oil), increased time spent traveling, increased response time for municipal and utility support, requirement of residents to have vehicles to avoid isolation, etc.
- Single-family residential development increases the tax burden on current residents: " Single family residences [in Beacon Falls]receive over $900,000 more in services than they pay in taxes. If single family residences "paid their way", their taxes would be 16% higher." (Central Naugatuck Valley Regional Plan of Conservation & Development, 1998).
- Development in outlying forested or agricultural areas contributes to habitat loss and fragmentation.
- Higher density developments in relatively rural areas can be in conflict with the intention of the residential zoning regulations. Note that even with a sewer line and a public water supply, the Kings Mark Environmental Review Team Report recommended a maximum density of .67 units per acre based on conditions for the Chatfield Farms I, which has a site similar in character to the Chatfield Farms II site.
- The proposal should be consistent with existing zoning (R-1). R-1 zoning in Beacon Falls allows for a lot size of 22,500 square feet for a single family dwelling with sewers and public water. Multiple units (2 family) require a minimum lot size of 33,750 square feet per structure, while R-1 zoning does not allow for four unit attached structures as proposed. The Town Plan of Conservation and Development states: "Beacon Falls may want to consider whether the potential density allowed in residential zones is what is desired. Allowing two-family residences in all residential zones limits the town's ability to plan for the density of development It is of particular concern in the R-1 Zone where very low density development is desired Limiting two family development and allowing low density multi- family development in areas around the town center reinforces community structure."

- The development is not consistent with the proposed PARD zoning which requires a "reuse" component in order for the zoning to be applicable (see highlighted section below). It is difficult to find any consistency between the development under PARD #1 with the development of a rural open space parcel zoned R-1.

"There is also a special provision in the regulations for special "Planned Adaptive Reuse Developments" (PARD) Zones to be established by the Planning and Zoning Commission. PARD zones can be established to facilitate the development of a tract of land of considerable size or existing improvements needing reconstruction or rehabilitation. Such a development has to be consistent with the character of the town and compatible with the neighborhood. The PARD District allows for the creative reuse of properties of historic and or architectural significance. The reuse of the Uniroyal industrial buildings on Main Street as a multifamily complex was achieved under this section of the regulations and is known as PARD #1. (Town plan of Conservation and Development page 28).

"Residents' concern about residential growth is probably less about the number of houses being built and more about where and how development is occurring. In essence, residents are concerned because they feel that the rural character of Beacon Falls is being harmed by each new subdivision that is built. Since zoning regulations already regulate lot size, coverage requirements and require that significant natural resources be preserved, the real issue of concern may be that town regulations do not go far enough in creating patterns that preserve land and discourage patterns that create "sprawl". Zoning regulations may also not go far enough in determining the desired density of development. Consideration should be given to increasing density and allowing mixed–uses in the center areas and decreasing density in more rural sections. Since development cannot be prevented, the challenge is to create patterns of development that help maintain the rural character of Beacon Falls by encouraging visible open space and reinforcing community structure." (Plan of Conservation & Development page 29).

*Promoting more desirable development patterns***.** Flexible patterns of land subdivision should be promoted based on defining buildable land and density requirements. Buildable land (land that is not designated as wetland, watercourse, floodplain or steep slope) is subtracted from a parcel to be developed and then a yield (number of lots to be allowed on the parcel) is determined. A developer is then free to design a subdivision, which best

preserves natural features, minimizes paved areas and conserves open space. As a result of the planning process it was determined that this can best be done by:

• recognizing and protecting scenic and historic resources,

• preserving open space in visible locations,

• *protecting water quality*

• creating a town center as a focal point, and

• providing for business growth in proper locations.

Key Issues

- Outward movement of population and employment in the Region resulting in:
  - a trend towards more sprawling development patterns,
  - an increased rate of land consumption in the Region,
  - new development being located outside of the regional core and outside of utility service areas,
  - a loss of open spaces in the Region, and
  - a loss of a sense of place or community in parts of the Region.
- Development on constrained land at the perimeter of the Region, bypassing:
  - fully serviced land closer to the regional core, and
  - "brownfield" sites in urban areas.

Recommendations

- Guide the location of growth in the Region towards the regional center and areas with infrastructure.
- Encourage settlement patterns that reduce the rate of land consumption.
- Facilitate sustained and coordinated efforts to renovate brownfield sites.
- Evaluate the fiscal impacts of growth within the Region.
- Encourage periodic review of local land use regulations.

Encourage settlement patterns that utilize infrastructure.

New development is most pronounced in rural parts of the Region where it consumes vacant land, alters community character, increases service and transportation demands, and impacts the environment. At the same time, costly public water and sewage systems are underutilized due to the lower intensity of development.

Recommendations

1. Encourage new housing at appropriate densities to take advantage of existing infrastructure and services.
2. Encourage infill housing and construction in and near community centers.
3. Discourage extensions of infrastructure and services to new developments at inappropriate densities, especially in outlying areas.
4. Review development proposals in undeveloped areas with an eye toward the impacts on existing open space, natural resources, and scenic vistas.

Specific recommendations based on submitted plan.

Note: These recommendations should be considered as minimum conservation measures that should be employed if the development is inevitable, not as an equal alternative to the previous section recommendations.

Protecting wetlands/ vernal pool habitats

Figure 1 demonstrates recommendations for protecting the vernal pool wetlands known as WC & WD. The blue line indicates the approximate surface drainage area contributing to the wetlands under current conditions based on the USGS Quadrangle map. This area should be left undisturbed to provide a minimum buffer and habitat for dependant vernal pool species. A minimum of 100 feet surrounding a vernal pool is required to maintain its functioning. Further, only a maximum of 25% of the 750 envelop around a vernal pool should be utilized for development. No Stormwater control structures such as detention basins should be located within the 750-foot area. Connectivity between wetlands and between wetlands and uplands is necessary for amphibians and wetland dependant bird species (Buffer Zones and Beyond page26).With these considerations in mind for this as well as the other wetland areas, a development “envelope” as indicated in **Figure 2** is derived.

It should be noted that leaving a conservation envelope as indicated in **Figure 2**, although it leaves a relatively intact interconnectivity between wetland/vernal pool areas, it does not necessarily leave intact upland areas sufficient for the maintenance of certain wetland plant and animal species nor does it necessarily meet the criteria for vernal pool buffers as evidenced by Calhoun and Klemens and others. For example, Wood Frogs and Spotted Salamanders are species particularly sensitive to loss of interior forested habitat (Wetland Buffer Zones and Beyond page 23). An arbitrary buffer line, even one at 750 feet, may not be as effective as disturbing some areas within 750 feet in order to leave intact particular habitat farther away than 750 feet. Examination of wetland buffer criteria is particularly important when evaluating the optimum placement of detention basins and other Stormwater control structures that can have a significant detrimental impact on wildlife when located within the 750 buffer of vernal pool wetlands. The wetlands investigation (Wetland Delineation Report Chatfield Farms II Beacon Falls Ct. March 1, 2006) included with the proposal is a thorough identification of the wetlands and their general functions but in order to determine a more effective conservation area boundary, a thorough scientific assessment (including sampling) of the wetlands and associated habitats should be undertaken. An assessment should also take into consideration nearby offsite wetland areas and associated habitats.

It should be noted that the wetland WC & WD area was observed to have surface drainage easterly onto the adjacent water utility property at the date of the site visit (See **Photo One**). Keeping disturbances out of the immediate drainage area of this wetland complex will assure the maintenance of existing surface water quality into the drinking water watershed.

No Stormwater should be directed towards vernal pool wetland areas (including emergency bypasses for the 100 year storm). Vernal pool wetlands are sensitive not only to water quality and quantity but also to periodicity; any changes in the hydrology of the seasonal pools can be detrimental to the pools function and the dependant life forms. (See Stormwater section below).

There should be no disturbance to the natural ground cover within 100 feet of vernal pool wetland areas. In the proposed Phase I construction narrative " No roadway construction should occur at this time other than that providing a reasonable at-grade route to the development areas that is at least 50 feet away from the wetlands *where practical."* (Emphasis added). Roadway construction should only create a disturbance within 50 feet of a wetland in *identified specific locations where absolutely necessary* and never within 50 feet in wetlands identified as vernal pool wetlands. Based on the concept presented in **Figure 2,** there should only be a need to be within 50 feet of a wetland at the road crossing between Chatfield I and Chatfield II.

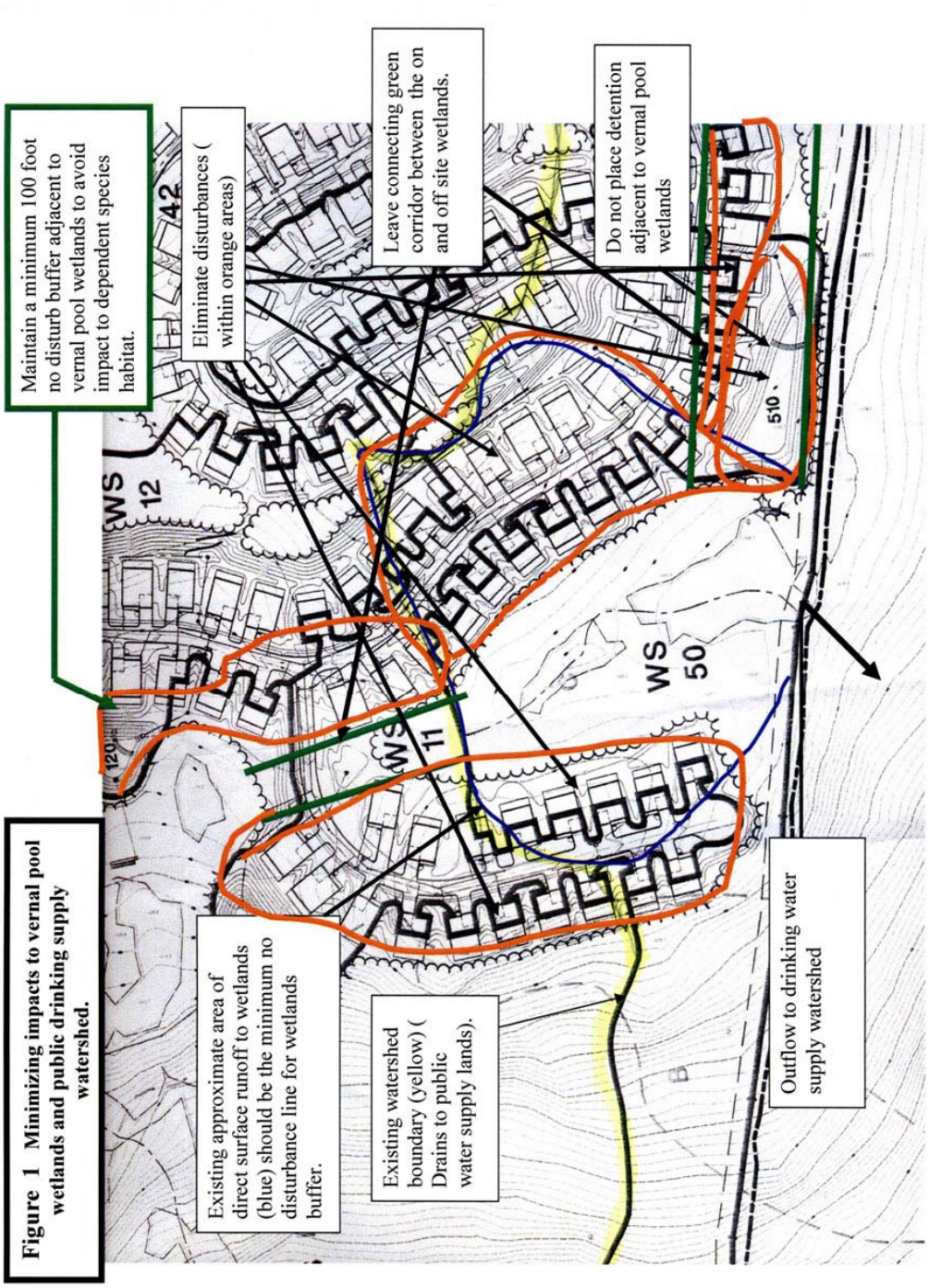


Figure 1 Minimizing impacts to vernal pool wetlands and public drinking supply watershed.

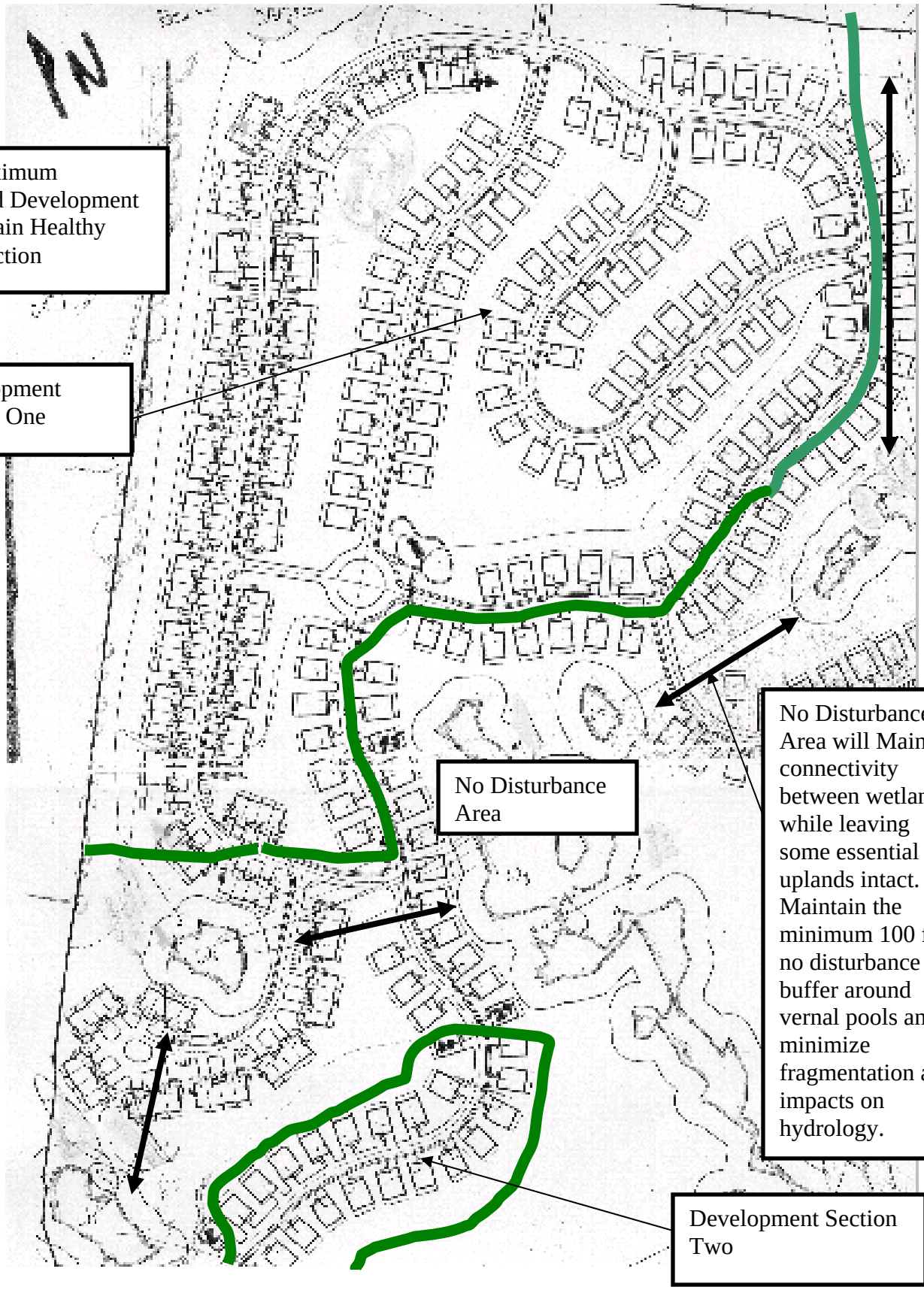
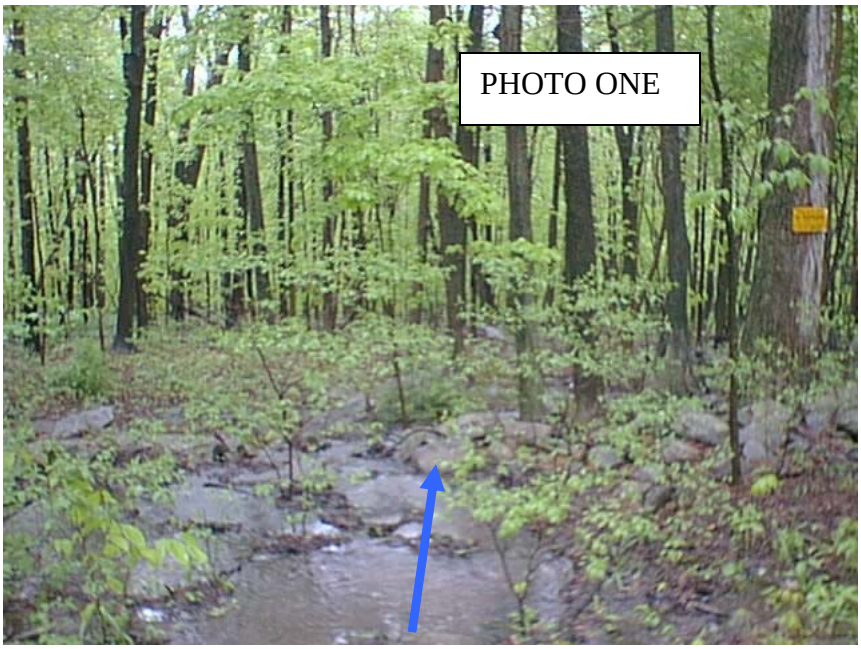


Figure 2 Maximum Recommended Development Area to Maintain Healthy Wetlands Function



Surface flow from the easterly wetland east onto drinking water supply watershed property.

Stormwater

Impervious surfaces associated with development contribute to polluted stormwater runoff. Pollution sources such as fertilizers and pesticides from lawns can be minimized through methods including the IPM management as detailed in the proposal "Engineering Report Integrated Pest Management Plan". Runoff from road surfaces can be at least partially treated in the wetland detention basins as designed according to the proposal. Ultimately the best Stormwater management should "… mimic the watershed's natural hydrologic functions or the water balance between runoff, infiltration, storage, groundwater recharge, and evapo-transpiration." (Low Impact Development Design Strategies page 1-2).

The first step is to leave as much of the existing hydrology intact as is possible (see **Figure 2**).The second step is to retain Stormwater as close to the source as possible. **Figure 3** demonstrates a possible means of retaining Stormwater closer to the source(s). Rather then convey Stormwater via yard drains, drainage from the yard area and roof runoff could be retained in a vegetated swale/basin with a controlled outlet. Another

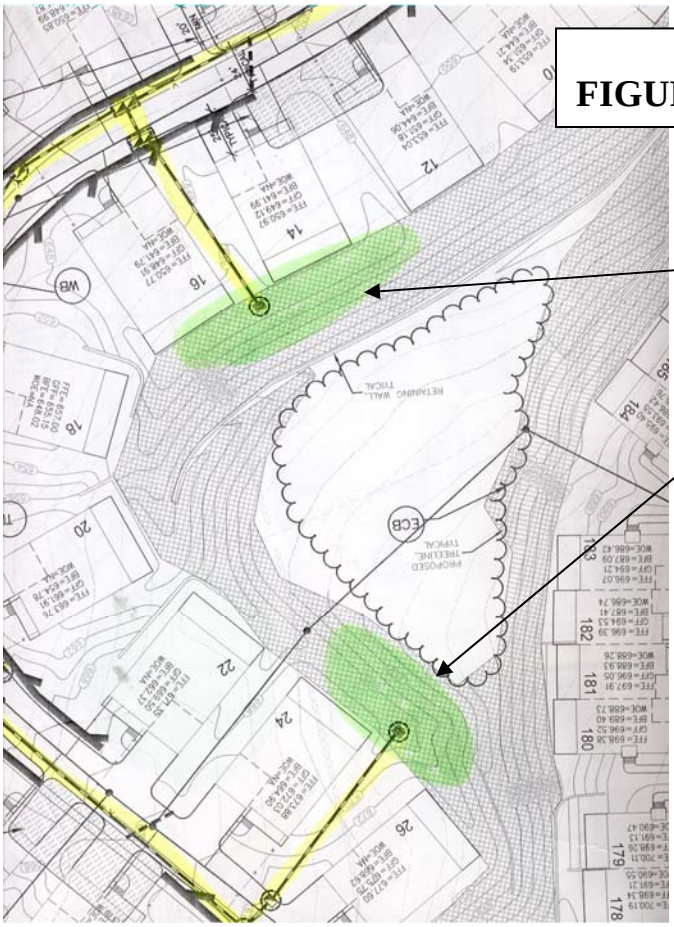
example is in **Figure 3A** –utilizing the area of the cul-de-sac for Stormwater retention The "raingarden": could be designed to maximize the use of the roof and yard runoff by a mixed herbaceous/ shrub/tree vegetation, to more closely approach pre-development water balances such as indicated in the first frame of **Figure 4**. In places where retaining walls are necessary, sloped weep garden designs can be utilized (**Figure 5**). The use of swales and other vegetated open channels should be encouraged in residential streets, parking lots, and back yards in place of conventional storm drain systems" (2004 Connecticut Stormwater Quality Manual, page 4-8). The concept is to utilize effective wetland pond detention systems such as specified in the development proposal and utilize various controls "upstream" from the detention ponds, decreasing volumes (and in some case size requirements of the detention basins), changing time of concentration, supporting more natural vegetation and creating a stormwater system with more "steps" instead of relying on one control (basin) per sub-watershed area. Distributing multiple, smaller, Stormwater control structures can also be a tool to support eliminating larger higher impact control measures which impact wetland wildlife and minimize impacts in the event of the failure or one or more measures (blocked outlet structure, clogged yard drain etc.).

See **Chart 3-5** below for more techniques for reducing the stormwater impact from development. (Reference: The Bioretention Manual: http://www.goprincegeorgescounty.com/Government/AgencyIndex/DER/ESD/Bioretention/pdf/intro_bioretention.pdf).

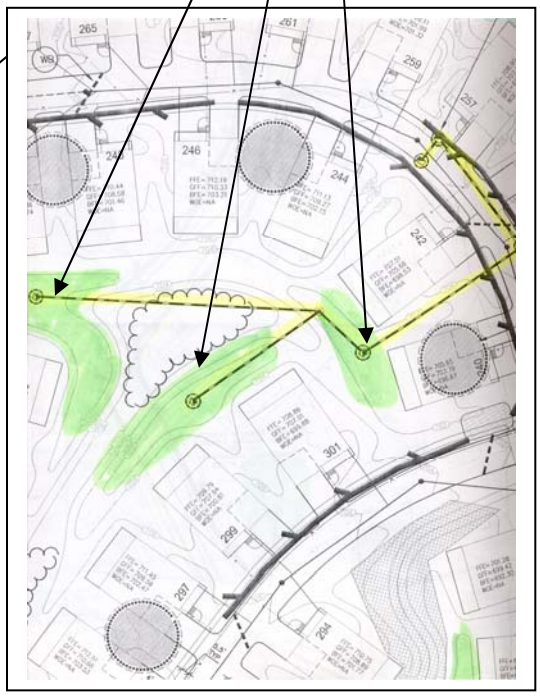
Table 3-5. LID Techniques to Maintain the Predevelopment Time of Concentration

Low-Impact Development Objective	Low Impact Development Technique									
	On-lot bioretention	Wider and flatter swales	Maintain sheet flow	Clusters of trees and shrubs in flow path	Provide tree conservation/ transition zones	Minimize storm drain pipes	Disconnect impervious areas	Save trees	Preserve existing topography	LID drainage and infiltration zones
Minimize disturbance	✓		✓	✓	✓	✓	✓	✓	✓	
Flatten grades		✓	✓			✓			✓	✓
Reduce height of slopes						✓			✓	✓
Increase flow path (divert and redirect)		✓	✓	✓		✓	✓	✓		
Increase roughness "n"	✓		✓	✓	✓	✓	✓	✓		✓

FIGURE 3



Instead of yard drains create rain gardens or bioretention areas with controlled outlets/ infiltration for native vegetation uptake/ retention of yard and roof drainage.



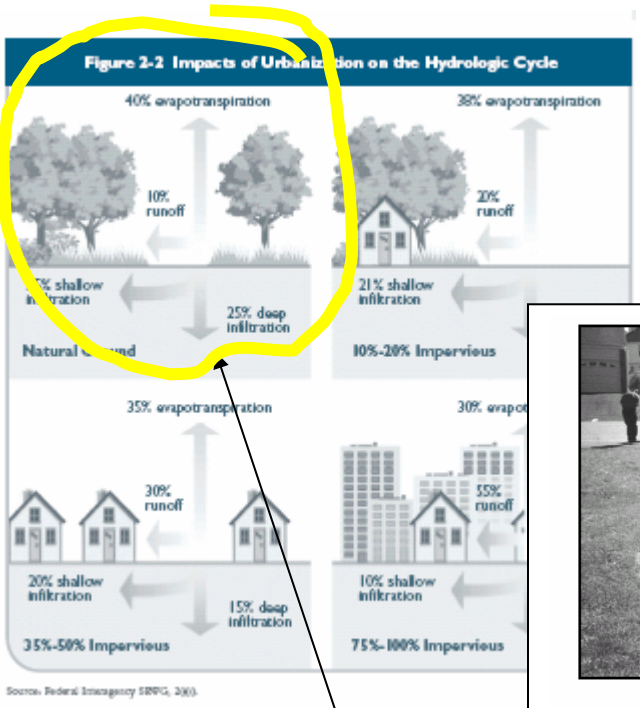
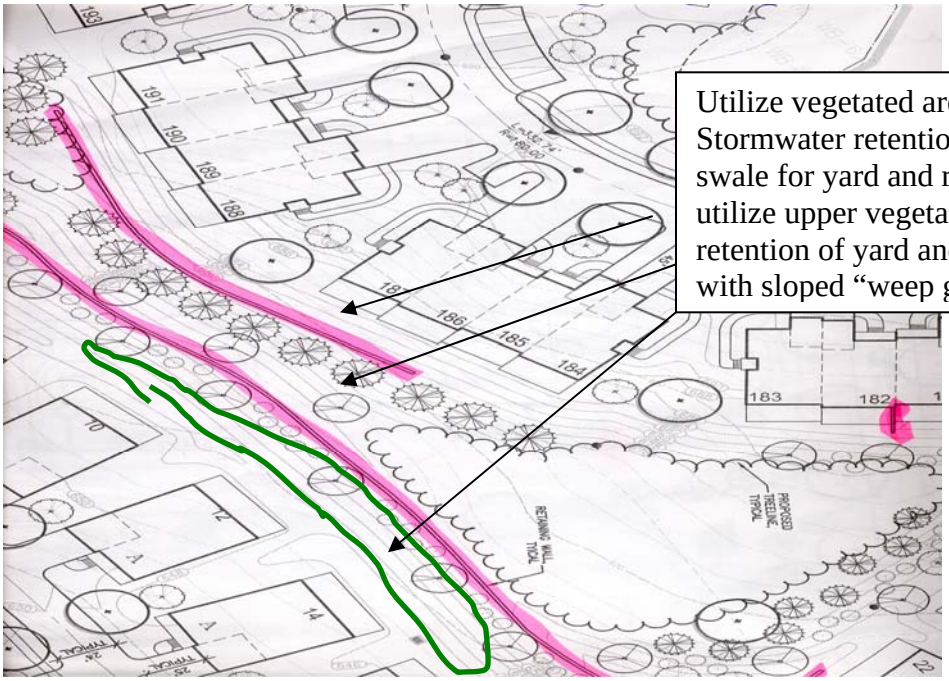


Figure 1.15: Rain Garden or Landscaped Garden Bioretention

Figure 4

Design Stormwater " treatment train" to create hydrologic conditions as close as possible to pre-existing conditions

Figure 5



1.9.2.3 Sloped "Weep Garden"

Bioretention facilities may be placed in areas that are sloped, if designed to accommodate the restrictive conditions. The use of a downstream side stone/wooden-retaining wall allows the soil-filtered water to slowly seep through the retaining wall. This type of design is also known as a "weep garden." See design limitations for weep gardens in Chapter 2.

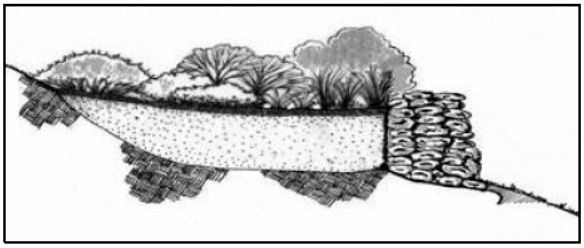


Fig. 1.21: Fieldstone weep garden design

The weep wall height should be kept below 3' with drainage areas less than 1 acre. The weep wall may be made of fieldstone, gabions, or railroad ties.

C) Preventing ground or surface water impacts on adjacent landfill site.

Two issues were raised within the ERT request concerning the nearby "superfund" site. One is whether groundwater at the site of the landfill would be affected by the proposed development and the other is whether there is any risk to having ahigh-density residential neighborhood near the landfill.

According to the United States Department of Environmental Protection Five Year Review Report for the Beacon Heights Landfill Superfund Site, September 2003, the hydrology of the site is as follows: "The bedrock surface is fractured and dips from the south/ southeast of the site toward the north/northwest, parallel to surface water drainage. Groundwater in the region occurs in both the unconsolidated deposits and in the bedrock and generally flows to the north/northwest". And:

" According to initial calculations, it was expected that leachate flow would drop to around 5 gpm within a few years. It has been postulated by prior studies that the remaining flow is due to upgradient clean groundwater interception and possibly upward flow from bedrock rather than continuing refuse leachate collection. Since the groundwater interception system completely surrounds the landfill to the depth of bedrock, interception of overburden groundwater is guaranteed"

" In the fractured bedrock zone, the direction of the potentiometric surface gradient of the gauged bedrock wells tends to be to the north-northwest"

This north-northwest groundwater "flow" is generally consistent with the surface water flow from the proposed development site, based on the topography (See **Figure 6**). However, there is no information provided on the topography in the area between the proposed development property line and the landfill operation. In particular there is no information given as to the location of the withdrawal of leachate nor is there any information given on soils and geology, though the indicated soils based on the NRCS soils information indicate Woodbridge soils with a restrictive layer at 20 to 40 inches in the area that slopes north north-west towards the landfill area.

Based on the above indicators more mapping and or field inspection is required to determine with accuracy whether or not there may be an impact on the landfill site hydrology which could affect ground or surface water volumes at the landfill site.

As for the potential risk to residents, the EPA report states : “The remedy at the Beacon Heights Landfill Superfund Site currently protects human health and the environment because the cap and leachate collection system are effectively containing the contaminants on-site, and the installation of the public water line along Skokorat and Blackberry Hill roads helps to ensure that nearby residents are not exposed to contaminants which may remain in the groundwater”. (Page 2).

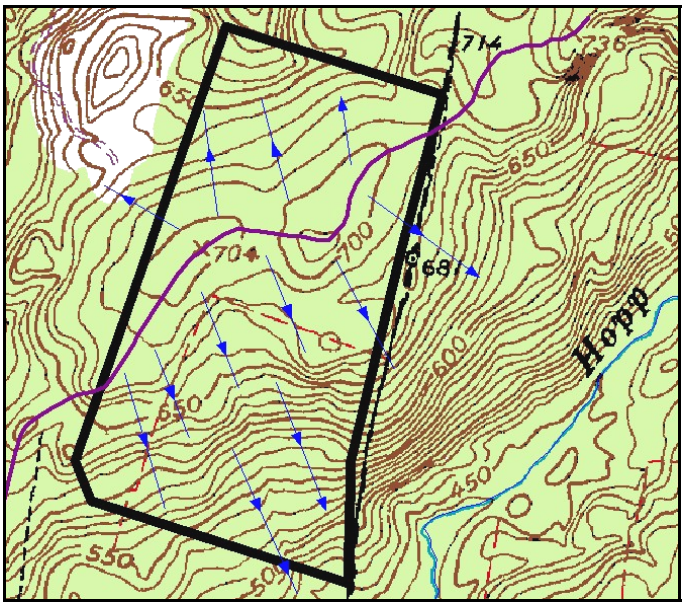
The EPA report does not address the issue of potential impacts of large developments on adjacent sites (or the potential impact of the landfill site on large developments). Given the EPA’s involvement with the management of this designated “superfund” site, it seems warranted to provide the EPA with the option to comment on this adjacent development proposal.

Soils Resources

Soils information is provided as **Attachment One, Map 2 (see Appendix).** Note included map that indicates the extent of Prime Farmlands and Farmlands of Statewide Importance which includes the Ridgebury, Agawam, Woodbridge, and Paxton and Montauk, soils. These areas should be considered when determining the extent of development and as much of the area of these soils preserved as is possible for potential future agricultural use.

Wetlands Review

The plan proposes construction of 235 unit subdivision. This will consist of 316 living units, some as single family residences, and others as four unit buildings. The area to be built upon is approximately 135 acres in size. Topographically it is divided into two different watersheds. The northwestern third (~45 acres) drains to the northwest ultimately into Hockanum Brook. The southeast two thirds (~90 acres) drains into Hopp Brook. Hopp Brook flows ~4.25 miles to the Naugatuck River after intercepting the wetland runoff from this site.



The image to the left shows the approximate boundary of the property as a black line. The purple(?) line represents the drainage divide - or ridge of high points across the parcel - from which precipitation will flow to the southeast, towards Hopp Brook, and northwest towards Hockanum Brook.

It rained for most of the field review on May 16, 2006. It had rained 0.92 inch the day before and the National Weather Service reported 5.78 inches fell the day of the field trip. (Precipitation was reported at New Haven about 11 miles distant.) The site was very wet at the time of the visit.

The total wetland acreage mapped on the property is 7.7 acres. Primarily the wetlands occur on the southeast portion of the property, and for the most part have been avoided. Other wetlands, smaller in size, are the vernal pools on the parcel. These are predominantly in the Knott Brook drainage.

Density

The estimated density of people per square mile in the town of Beacon Falls for the year 2000 was 535 people (Source: http://clear.uconn.edu/projects/landscape/local/town.asp?townname=6&Go=Go). Towns that neighbor Beacon Falls have population densities as follows:

Naugatuck	1,913 psm	Seymour	1,051 psm
Bethany	240 psm	Oxford	298 psm

In contrast, some of the densest populations in the state can be expected in the urban areas:

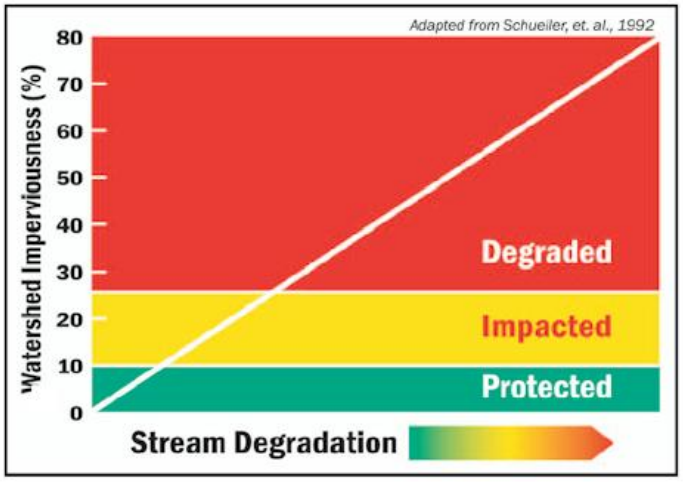
Waterbury	3,725 psm	Meriden	2,427 psm
Bristol	2,258 psm	Danbury	1,701 psm

This development proposes a population density that equals 4,352 people per square mile (psm) for the Chatfield Farms II site. (135 acres minus 41.5 acres of open space yields 93.5 to be developed. Onto this acreage is proposed 316 living units, averaging .296 acres per unit, or 3.4 units per acre. At two people per dwelling unit, that is 6.8 people per acre or 4,352 per square mile.)

CONCERN: Population density and water quality.

The southern two thirds of the parcel are classified as having AA water quality. The entire geographic extent of this AA area is now, or will be, considered for drinking water potential. In fact, this specific area **is** designated to supply water under emergency conditions. Therefore, it is imperative that both the ground and surface water quality be maintained.

A potential conflict which leads directly to degradation of water quality is high density land use. As the percentage of impervious surface in the watershed increases, the water quality decreases. Frequently referred to are the numbers/ranges seen in the following graphic:



This graph is taken from NEMO Fact Sheet Number 3 entitled: Impacts of Development on Waterways. *This Fact sheet and graphic are available on line at:*

http://nemo.uconn.edu./publications/fact_sheets/

The graph above depicts the water quality of a stream as being generally well protected when the imperviousness in the watershed is 0-10 percent of the total land cover. The numbers show that from that 10 percent to about 26 percent imperviousness, impacts compromise the water quality. After ~26 percent definite water quality degradation is taking place. As with many studies, the numbers are not absolute for every scenario, but the concept is sound.

Location in the watershed - It is especially important that the top, and sides, of the watershed be able to provide decent water quality down gradient in a potential drinking water supply. As is depicted in the first image in this section, this proposed development is within the side-wall headwaters area for runoff into Hopp Brook. It is noteworthy that the water quality is the reflection of the land use in the watershed. Thus, a fairly undeveloped watershed should, and in this case does, yield high water quality throughout its flow path.

Currently the DEP maps the surface and groundwater quality of the Hopp Brook drainage as level "AA". This is on a rating scale of "AA" being the best, "A" being next, then "B", "C", and finally "D". The full text of the DEP's *Water Quality Standards and Criteria* can be found on the web at: http://www.dep.state.ct.us/wtr/wq/wqs.pdf The town should strive to maintain this water quality (along with the health and integrity of the wetland systems) long term within the basin. This can be accomplished in part by minimizing runoff from impervious surfaces.

Impervious surfaces

Road Construction

The plan as proposed calls for the introduction of ±12,350 linear feet of 24 foot wide road way. At 24 feet wide, the amount of impervious surface added to this parcel amounts to approximately 6.8 acres. In effect, a water runoff and sediment collection system is constructed to service the needs of the newly built subdivision. This system will need maintenance in perpetuity once it is constructed. This task will fall to either the homeowner's association or the municipality.

Historically/typically, runoff from impervious surfaces is channeled into roadways, then directed by the curbs downhill to pass into storm drains. The storm drain system in turn typically collects the heaviest sediments and then outlets into, or just upslope of, the wetlands. Storm water brings with it oil, fuel, and antifreeze leaks from vehicles, pesticides and fertilizers from lawns and frequently animal and other waste products. Minimizing point source runoff from impervious surface is one way to decrease the impacts to the wetland systems. This can be achieved through a well thought out system of road drainage which includes curbed and curbless areas, and effective use of catch basins in combination with sump maintenance.

Road Sand

As the number and width of road surface miles per basin increases, so does the amount of road sand applied during the winter months. Some things to keep in mind:

Connecticut has a no-tolerance level for snow and ice on its roads. As a result, large quantities of road sand are applied every winter to keep the travel ways safe. The DEP estimates that on average in urban settings more than 40,000 pounds of sand (20 1/4 tons) is applied per road mile every year. Of that total, approximately 30-50% is collected in the spring through street sweeping. Thus, ~12 tons of sand is left on every road mile, every year.

Because of the nature of the Connecticut's hill and valley topography, roads are often in close proximity to wetlands and watercourses. This aspect of the landscape makes it highly likely that, over time, most of the uncollected sand will move downslope into the wetlands and watercourses. These sediments can destroy aquatic habitat, fill in water bodies and bring chemical pollutants. The impacts of sand deposition (typically in combination with elevated salt levels and increased

water temperature [thermal pollution]) on spawning streams and wetlands with close proximity to roads is well documented. Road sand itself can be a major pollutant source by carrying with it: nutrients, oil, and metals to the rivers, streams, and lakes.

In the springtime, after the danger of icing, if the road sands are swept/collected later than sooner, the impacts are worse. This is because the constant grinding of automobile tires reduces sand particle size. These finer particles are held in suspension longer and thus carried further downstream before they are deposited.

Using these numbers, approximately 47 tons of sand will be applied to the proposed ~12,350 feet of road every winter. Of this total perhaps 40 percent will be collected. This leaves ~28 tons, or 56,000 pounds of sand on the roads of this subdivision *every year*, slowly moving down gradient.

As a result of the potential long term impacts from road sand to the water resources, towns are urged to sweep the roads as soon as possible in the spring and maintain their catch-basin clean out schedule. Many municipalities, unwilling or unable to take on the maintenance of new systems call for the formation of a homeowner's association. The Association then assumes a plan with an agreed upon schedule of maintenance intervals with the town. Reasonably, the town wetland or public works sector keeps the status of the proposed maintenance.

Another way to decrease runoff from impervious surfaces is through the handling of roof runoff.

Roof Runoff

Very often the downspouts from the roof of a home lead water directly to an impervious surface such as a driveway. It then flows into the street and down gradient. Collectively, the total surface area of 316 housing unit's roofs can be substantial, adding acres of impervious surface to the project area. To reduce runoff and to most closely mimic the water path of preconstruction flow, two things can be done.

The first is to have the roof downspouts discharge directly into the ground. This eliminates runoff and will aid in the on-site groundwater recharge on each house lot.

Second is the construction of rain gardens, which also provide the water with an opportunity to recharge or infiltrate into the groundwater.

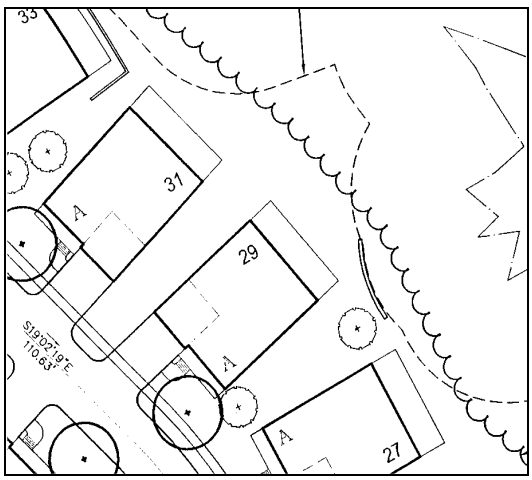
This image depicts the rain garden close to the downspout. Care must be taken during construction not to compact the soil in the area of the intended rain garden or infiltration will not be possible. (Photo courtesy of NEMO.)

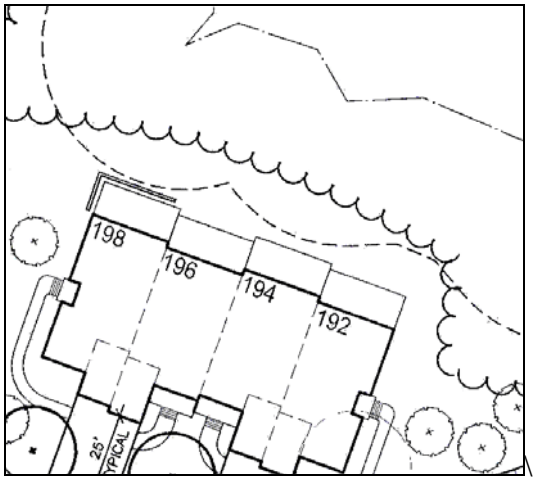
This image depicts the rain garden receiving piped roof runoff which enables the garden to be further away from the house and downspouts. (Photo courtesy of North Carolina State University.)

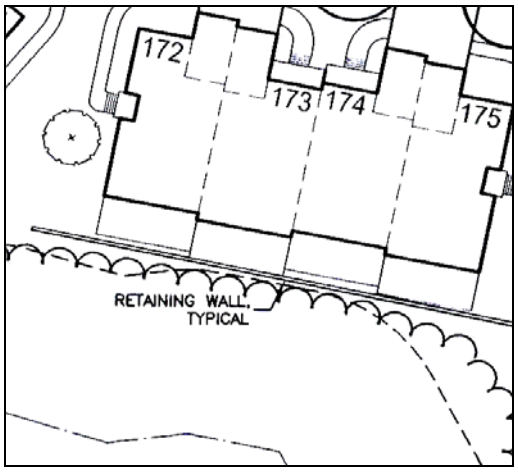
CONCERN: Wetland Setbacks

The wetland setbacks used on this proposal are 50 feet, and these limits have been met and exceeded. However, this reviewer does not think it practical or realistic to expect that wetlands will be protected when the proposed housing units literally abut the wetland setback. Most often, in a typical residential subdivision, the wetland setback is at the far edge of the back yard of the property. Even in that scenario, residents make use of the buffer as a yard waste dumping ground.

But the proximity to the wetland buffer edge of the proposed housing units is so immediate that likelihood of wetland impacts is certain to increase. If built as drawn, the wetlands can expect degradation in the long term future.







In these three images the wetland boundary delineation is the long dash and dot line. The short-dashed line represents the 50 foot wetland setback.

In all three sections the wetland setback almost literally abuts the back of the proposed property.

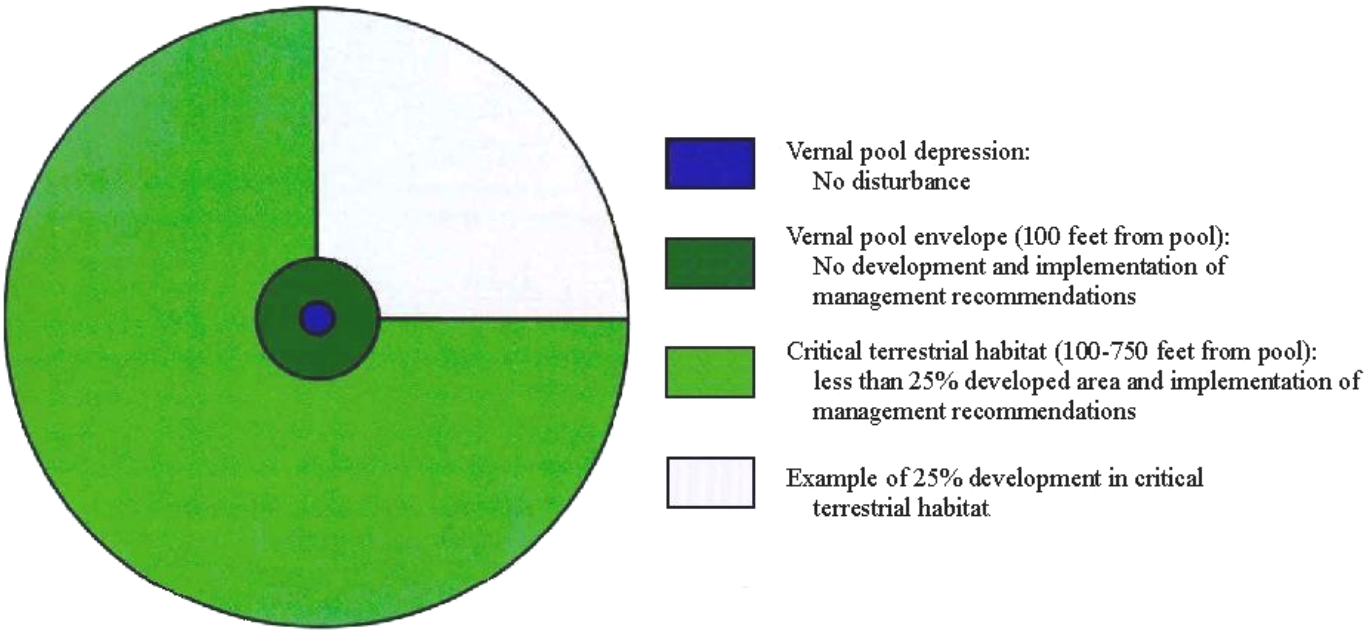
Vernal Pools - Proximity of Lots

The largest integral part of the vernal pool ecosystem is the upland area which neighbors the pool. This typically extends away from the pool uphill or upslope to drier soil types. The slopes often vary from gentle to steep. It is in these slopey areas that amphibians spend over 90% of their adult lives. They travel up hill to the well drained soils to burrow. In places, some usable slopes can approach 45 degrees or more. The drainage areas for these vernal pools typically measure 2-3 to 5-6 acres. Vernal pools are fed primarily by surface water runoff and precipitation. Thus, local impacts (polluted runoff) can have dramatic, damaging impacts on the vernal pool ecology.

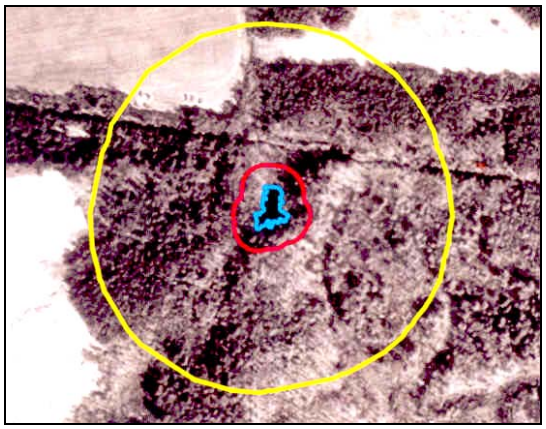
There is extensive information in print about vernal pools. Much of it points to the fact that the reduction of a certain percentage of the encircling habitat will have telling impacts on the breeding ecology.

Dr. Michael Klemens suggests in his book, co-authored with Dr. Aram J.K. Calhoun, entitled: "*Best Development Practices – Conserving Pool Breeding Amphibians in Residential and Commercial Developments in the Northeastern United States*" that there be no development in the 100 foot buffer around the vernal pool, and no more than 25% in the critical terrestrial habitat, that is, the distance from 100 feet to 750 feet away from the pool. Indeed, the upland use by various vernal pool amphibians can range from 386 feet from the pool for spotted salamanders to 1,550 feet from the pool for juvenile wood frogs (3,835 feet for adults). (Dr. Klemens'document may be obtained from the DEP Store: http://www.dep.state.ct.us .)

Dr. Klemens' recommendations from the above document are seen in this diagram below:



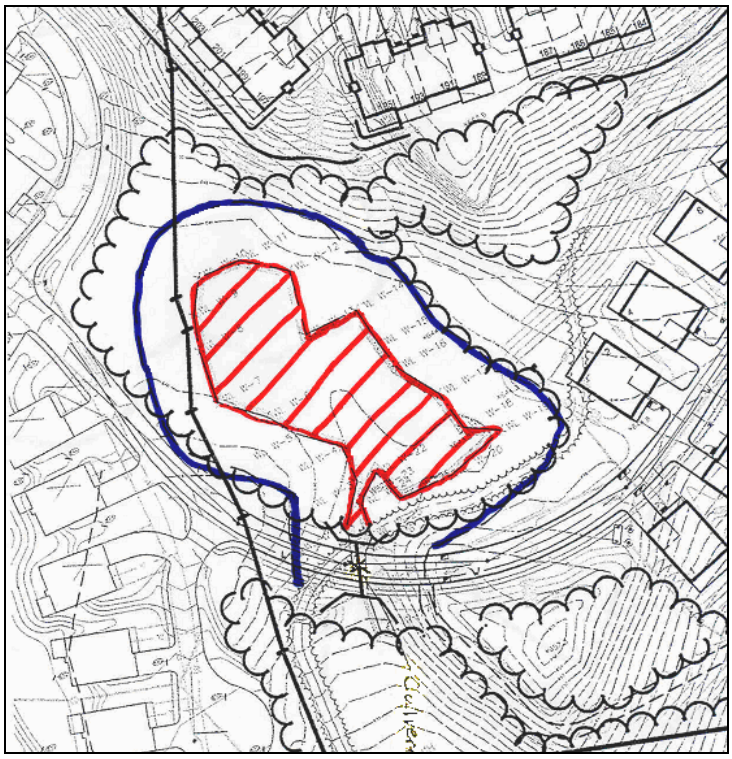
Vernal Pool Management Areas and Recommendations, *Klemens et al*



In this aerial photograph the vernal pool is shown in blue with the undisturbed envelope in red, and less than 25% of the critical terrestrial habitat developed, as bounded by yellow. Existing amphibian populations will likely remain viable in this pool. (Klemens et al).

This vernal pool is shown in blue with <u>some</u> disturbance in the envelop shown in red and more than 25% of the critical terrestrial habitat having been developed within the yellow line. It is highly unlikely that this pool will be able to support viable amphibian populations. (Klemens et al).

Certainly the proposed construction does not come close to the approximations as cited by Dr. Klemens. The image below shows how this proposal, in combination with Phase One construction, would very nearly encircle the entire breeding vernal pool.



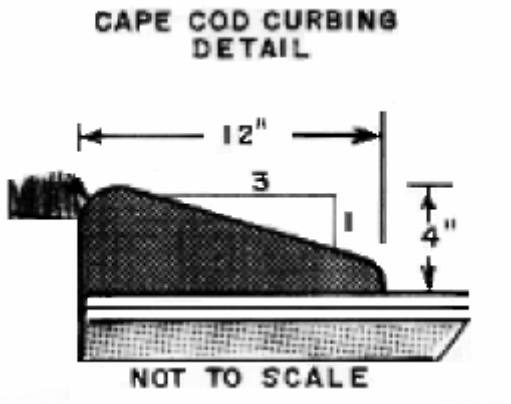
This vernal pool in the southwest corner of the proposed subdivision would be nearly encircled by the combination of roads, living units and construction from Phase One. Here the pool is bounded by the red lines and the 50 foot setback is the blue line.

The above setback information is verified in the Milone and MacBroom, Inc. (MMI) report entitled: *Wetland Impact Assessment* dated June 5, 2006. In the report on page four, MMI describes a continuously breeding vernal pool they have observed which is surrounded 75% by a corn field and 25% by forest, which is separated from the pool by a 25 feet road crossing. Page nine in the report shows the MMI Vernal Pool Assessment Sheet that. On it they note that open agriculture land, forests and partial forests are considered undeveloped. Thus, MMI's assessment criteria shows their observed vernal pool, surrounded as it is by so much undeveloped space, to be in a good position to support continuous breeding, which in fact it does. That, however, is not the case for the land use designed around the vernal pool depicted above.

Use of Curbing

Road ways in the vicinity of the vernal pools frequently cut across amphibian migration paths. Vertical curbing does not allow for the passage across the road of small amphibians. The curb walls are cliff-like to them and form an insurmountable barrier. Cape Cod curbing however, because of its gentle profile, does allow for the pool-to-upland migration because of its lower over all height and low gradient slope.

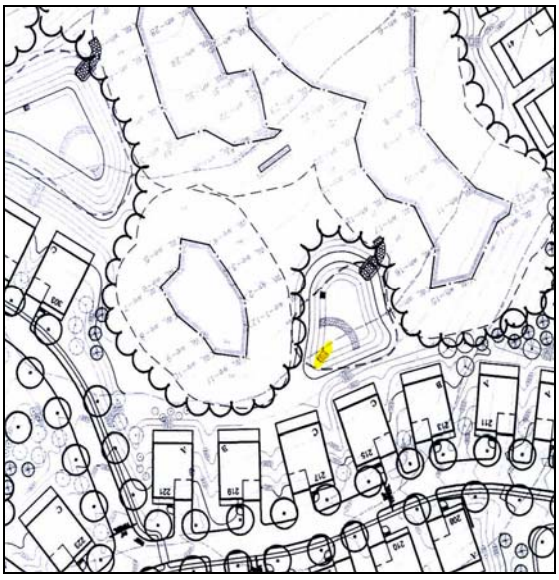
In addition, curbs often function as a means of channeling water to storm drains. To minimize the flow to the storm water system, where possible, the applicant should be encouraged to use no curbs (typically in low gradient areas). This allows runoff to more easily infiltrate in non-point locations. It also serves to take the pressure off of the stormwater system and allows the land to more naturally renovate the runoff, ultimately protecting the wetland resources.

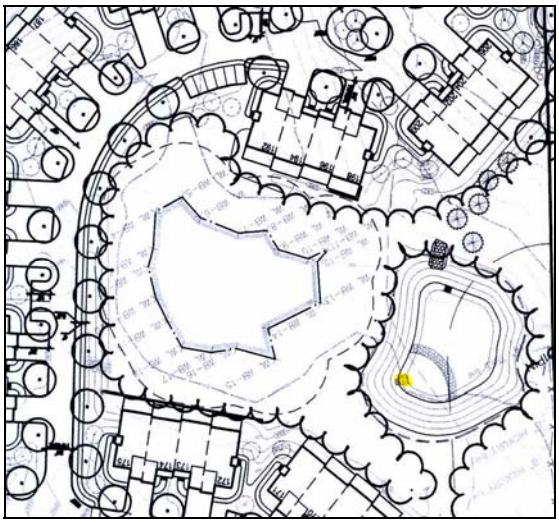
	*This drawing shows Cape Cod curbing in profile. Typically made of extruded asphalt, it is easy to see the advantage for wildlife passage.*

Conclusion

By all reports the developers have been good stewards of the land in the first phase of their project. This phase however proposes extremely dense development. A reasonable and prudent alternative is to decrease some of the intensity of development in general, and around the vernal pools in particular.

In addition, a strong concern is the wetland health four or five years from now and beyond. Maintenance of the storm water system will play a large part in this. As discussed above, much road sand is left on paved surfaces each year. Over time the sand will work its way into the storm water system and the resulting sediment loading will compromise the effectiveness of these systems. Maintenance access to these structures is not depicted on the plans submitted to the Team. This is a concern and should be addressed, depicted, and legally spelled out so neighboring housing units will understand their proximity.





The basins depicted in these three diagrams will all discharge storm water at the yellow highlight into a detention basin. The basin will serve to treat the water and then discharge it into the neighboring wetlands. Should there be a problem or failure with the basin system there is no access road or official right-of-way in place to gain access to these structures. Thus, if there is no access, then problems will not be resolved and the wetlands could very well be degraded in the long term.

* * * * * *

Stormwater Review

Stormwater Permitting

Since the site construction involves the disturbance of over five acres, Connecticut's General Permit for the Discharge of Stormwater and Dewatering Wastewaters (the "Permit") will cover the project. The permit requires that the site register with the Department of Environmental Protection (CTDEP) at least 30 days before the start of construction. The registrant must also prepare, submit and keep on site during the construction project a Stormwater Pollution Control Plan (the "Plan").

Due to the size and potential impacts on natural resources of this project, the Department has recommended to the developer that the pollution control plan be submitted 180 days prior to the start construction. If the Department finds that the Plan is inadequate, Connecticut General Statutes Section 22a-430b and general permit Section 7(c) allow the Commissioner to require an individual permit, a process that could delay approval of the project for several months. In order to prevent this and to ensure adequate review time, the Department has requested early submittal of the plan.

Please note that this review is only specific to the plans in front of this reviewer and not on the whole project. This review is based primarily on the state Permit, but many of the erosion and sedimentation issues are included in the Connecticut Guidelines for Soil Erosion and Sediment Control ("the guidelines"), and are issues that must be dealt with on a local level before being included in the Plan. It should also be noted that the permit requires compliance with the guidelines. The developer must register for the permit or modify the existing permit, and the contractor and any subcontractors involved in grading must sign the contractor certification statement in the permit. Any registration submitted by anyone other than the developer will be rejected.

The Plan must include a site map as described in Section 6(b)(6)(A) of the General Permit and a copy of the erosion and sedimentation (E & S) control plan for the site. The

E & S plan that is approved by the Town may be included in the Plan. This plan and site map must include specifics on controls that will be used during each phase of construction. Specific site maps and controls must be described in the Plan, as well as construction details for each control used. The permit requires that "the plan shall ensure and demonstrate compliance with" the guidelines.

Due to the amount of soil disturbance, one of the best ways to minimize erosion potential is to phase construction in order to minimize unstable areas. The Plan must be flexible to account for adjustment of controls as necessary to meet field conditions. At a minimum, the plan must include interior controls appropriate to different phases of construction.

This phase of the project has a significant amount of runoff in its undisturbed state, steep slopes, a large amount of wetlands, very poorly drained soils, and sensitive surface waters that must be protected, which will make weekly inspections and modifications to erosion controls an important part of this project. The permit (Section 6(b) (6) (D)) requires inspections of all areas at least once every seven calendar days and after every storm of 0.1 inches or greater. The plan must also allow for the inspector to require additional control measures if the inspection finds them necessary, and should note the qualifications of personnel doing the inspections. In addition, the plan must include monthly inspections of stabilized areas for at least three months following stabilization and the end of construction. Due to the scope and potential wetland and stream impacts of this project, there must be someone available to design and adjust E&S controls for changing site conditions, which has the authority and resources to ensure that such necessary changes are implemented.

Particular attention must be paid to the construction in the area of the site, which is close to the Beacon Heights Landfill (Superfund site). Soil type and the location of water table must be considered when cutting and filling of slopes during the construction process. Also, when the cutting and filling portion of the project is conducted please ensure that the tops of the slopes are stabilized with berms or other means that comply with the

guidelines. The Department recommends erosion control matting for slopes greater than 3 to 1.

Structural practices including sedimentation basins are required for any discharge point that serves an area greater than 5 disturbed acres at one time. The basin must be designed in accordance with the guidelines and provide a minimum of 134 cubic yards of water storage per acre drained. At a minimum, for discharge points that serve an area with between 2 and 5 disturbed acres at one time, a sediment basin, sediment trap, or other control as may be defined in the guidelines for such drainage area, designed in accordance with the guidelines, shall be designed and installed. All sediment traps or basins shall provide a minimum of 134 cubic yards of water storage per acre drained and shall be maintained until final stabilization of the contributing area. Outlet structures from sedimentation basins shall not encroach upon a wetland. If a level spreader is used specific design criteria outlined in the guidelines must be followed. Level spreaders must be meticulously installed in order to work properly. Maintenance of all structural practices shall be performed in accordance with the guidelines, provided that if additional maintenance is required to protect the waters of the state from pollution, the Plan shall include a description of the procedures to maintain in good and effective operating conditions.

Section 6(b)(6)(C)(ii) of the permit requires the plan to address dewatering wastewaters that this site may generate. Specific details for construction control during installation of any wetland crossings must be provided. A description of the operational and structural practices which will be used to ensure that all dewatering wastewaters will not cause scouring or erosion or contain suspended solids in amounts which could reasonably be expected to cause pollution of waters of the State needs to be included. Dewatering wastewaters shall be discharged in a manner, which minimizes the discoloration of the receiving waters.

Particular attention must be paid to the areas during construction that will drain towards Bladen's River, Hockanum River, and the Naugatuck River, and the intermittent watercourse(s).

Post-construction Stormwater Treatment

The permit (Section 6(b)(6)(C)(iii)) requires that the plan include a design for post-construction stormwater treatment of 80% of total suspended solids from the completed site. In order to comply with this requirement, the Department recommends incorporating swirl concentrator technology. Although, swirl concentrators are effective at removing sediment, they require a long-term maintenance commitment from the town or a homeowners association greater than that required for a basin once it is fully grown-in and stabilized. If an in-ground, "black-box" solution is used, swirl-concentrator technology is a minimum requirement. Some newer generation swirl concentrators also incorporate filtration systems to address other pollutant issues, but these also require long-term maintenance plans.

Erosion and Sediment Control Notes

General permit stabilization requirements include the following: "where construction activities have permanently ceased or have temporarily been suspended for more than seven days or where final grades are reached in any portion of the site, stabilization practices shall be implemented within three days".

Other Issues

Of special concern is the close proximity to the Beacon Heights landfill. Runoff from the project should not be directed towards the landfill. Our concern is that the development may cause concentration and infiltration of stormwater, especially in the northern part of the development, which may cause increased leachate production at the landfill.

Leachate production increases quickly following rain events, most likely due to recharge to the bedrock in the wetland area abutting the landfill. If the wetlands are developed and

stormwater from a larger area is collected there, the precipitation-related increases in leachate flow will likely be larger and last longer than prior to development. The leachate is treated at the Beacon Falls POTW; if there is a large and/or sustained increase in flow, that flow could possibly overwhelm either the collection system at the landfill or the treatment system at the POTW.

If the development proceeds and the northern part of the site is in fact used for stormwater infiltration, the developer should study fracturing in the bedrock to determine what the effect would be on conditions at the landfill. The developer should also do such study if they are going to conduct extensive blasting near the landfill (at the ERT field review meeting, it had not yet determined where or how much they would need to blast, although they'll certainly need to do some blasting).

This report addresses some of the major issues concerning the project and does not constitute a complete review of the Plans for permitting purposes.

Additional Comment from Christopher Malik, DEP, Watershed Coordinator:
Substantial comments relative to changes to the water flow near the closed landfill have been made by Sheila Gleason, via Donna Seresin.

The CT Department of Health

Drinking Water Section Review

The Department of Public Health Drinking Water Section (DWS) offers comments under the authority of Connecticut General Statute 25-32f, which allows the DPH to comment on modification to a local town plan of development as it concerns the protection of public drinking water sources. Under CGS 8-23, the Town is required to consider the need for protection of existing and potential public drinking water system sources within its Town Plan of Conservation and Development.

The proposal seeks to expand a project which is currently under construction on Skokorat Rd. in Beacon Falls, known as Chatfield Farms I.. Chatfield Farms I is an approved 235 unit subdivision, and Chatfield Farms II will add an additional units on 135 acres that utilize public water and sanitary sewer. This project is located within the Public Water Supply Watershed for the Hopp Brook Diversion, and source of drinking water, which is part of the inactive Beaver Brook Reservoir System owned by Birmingham Utilities. According to Birmingham Utilities' 2003 Water Supply Plan, the Beaver Brook System is scheduled for reactivation in 2016, and currently serves as an emergency source.

This development conflicts with State Policy from the *2004-2009 Conservation and Development Policies Plan for Connecticut* (State C&D Plan), which recommends that intensive development be guided away from existing and potential water supply watersheds and aquifers. The C&D Plan states:

> *"Guide intensive development away from existing and potential water supply watersheds and aquifers and consider the cumulative effects of incremental growth in state, regional, and local planning programs and regulations"* Page 82

The plan mentions requiring minimum lot sizes of two acres of "buildable" area (excludes wetlands). Although a portion of this property will be dedicated open space, the average lot size of this application is approximately one half acre, which is denser than the state plan

recommends. Chatfield Farms II again conflicts with the State C&D Plan as it seeks to extend sewers into a public water supply watershed:

> *"Avoid sewage collection systems except when essential to solve existing area-wide problems, limit state funding to a level necessary to solve pollution problems associated with existing development to avoid further intensive development on the watershed or aquifer. Disapprove plans for facilities that are excessively sized or that extend to areas where alternative remedial measures are possible." Page 83*
>
> " *Evaluate regional and municipal plans of conservation and development and municipal zoning regulations to promote protective measures with the most stringent measures focused on critical areas, which are those closest to either a reservoir or diversion and its tributaries or a well field. Permit land use types and intensities that do not require sewer service. Design and manage land uses so that any waste discharges are treated completely on-site without contamination of ground or surface waters. Minimize site disturbance and utilize a site's characteristics for development through the use of cluster zoning, open space, conservation easements, or similar techniques. Continue to build stewardship and a conservation ethic in communities to protect and improve water quantity and quality." Page 83*

In light of these conflicts with the State C&D plan, and the potential adverse impacts to a future source of drinking water, the DWS does not recommend approval of this project. If the project is to move forward the following regulations may be applicable:

1. Pursuant to Connecticut General Statute Section 25-32, and the Regulations of Connecticut State Agencies (Public Health Code) Sections 25-37c and 25-37d a Water Company Lands Permit may be required for this project prior to construction. If the property owner is a public water system, regardless of its relationship with this project, this property meets the definition of water company owned land.

2. Section. 19-13-B32 (i) of the Public Health Code may apply stating – “The design of storm water drainage facilities shall be such as to minimize soil erosion and maximize

absorption of pollutants by soil. Storm water drain pipes, except for crossing culverts, shall terminate at least one hundred feet from the established watercourse unless such termination is impractical, the discharge arrangement is so constructed as to dissipate the flow energy in a way that will minimize the possibility of soil erosion, and the commissioner of health finds that a lesser distance is advantageous to stream quality. Special protections shall be taken to protect stream quality during construction."

The Natural Diversity Data Base

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

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

Please 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 application submitted to DEP for the proposed site.

Planning Considerations

The proposed Chatfield Farms II Active Adult Community is not in conformity with the future land use maps of the plans of conservation and development for the Central Naugatuck Valley Region and the State of Connecticut. Both maps recommend that this portion of Beacon Falls remain rural in character. Such an active adult community would require an intensity of development not compatible to maintaining the rural character of this portion of Beacon Falls. Furthermore the proposal is not in conformity with Beacon Falls' *2002 Plan of Conservation and Development*'s development plan map and is not currently permitted under the town's zoning regulations or zoning map.

The *Central Naugatuck Valley Regional Plan of Conservation and Development*, adopted December 1998, promotes prudent conservation and development of the region. The plan advocates guiding future growth towards the regional center as well as towards areas with pre-existing infrastructure. A key objective of the plan is to encourage settlement patterns, such as cluster development, that reduce the rate of land consumption in the region. The proposed Chatfield Farms II development does not support these objectives.

The proposed Chatfield Farms II Active Adult development is a continuation of the adjacent approved 235-unit Chatfield Farms I subdivision. Chatfield Farms II proposes 316 units for a combined 551 units of active adult housing. According to a December 2004 housing estimate from the state Department of Economic and Community Development, Beacon Falls has 2,188 housing units. If all the Chatfield Farms units are built, they would represent approximately 20% of the housing units in Beacon Falls. It would also reduce the number of suitable sites within the town available for the development of other housing types, particularly affordable housing for young families.

The *Regional Plan* encourages a variety of housing types throughout the region. The region's senior and elderly population is projected to continue growing through the year 2010. A diversity of housing types is a regional priority; however a large share of the new and proposed development across the region is solely active adult. Reserving 20%

of the town's housing units for residents 55 or older with no children under 21 may not necessarily support the *Regional Plan*'s housing goals.

As of October 2005, approximately 6,000 units of age-restricted housing had been built, approved, or proposed in the Central Naugatuck Valley Region. Over 1,300 of the built or approved units are located in the neighboring town of Oxford. As of the 2000 Census, there were only 988 residents of Beacon Falls aged 55 or older. Although some of these residents may move into either Chatfield Farms I or II, the majority of these 551 active adult housing units will be bought by people from outside Beacon Falls. Currently, Chatfield Farms I is being advertised on a billboard overlooking I-95 in Fairfield.

Active adult housing requires primary residents to be 55 and older and forbid children under the age of 21. Since the new residents of Chatfield Farms I and II will be primarily from outside of the Beacon Falls, these developments will disproportionately age the town's population. This aging may require the town to provide more expanded transportation, emergency, and senior services than if Chatfield Farms II was not age-restricted.

On *Regional Plan*'s future land use map, the proposed development site is recommended for conservation as a Rural Area. Any development, within a Rural Area, should respect natural resource and environmental constraints. Low-density residential development is an acceptable land use for rural areas, according to the *Regional Plan*. The plan however does not recommend the extension of public water and sewer into rural areas because currently permitted land use densities are too low to be efficiently served with infrastructure. Generally, the benefits of serving low-density development are less than the expense of extending public sewer and water lines.

Chatfield Farms II is proposing denser development than what was approved for the Chatfield Farms I development. The proposal calls for a total of 316 housing units on a 135 acre site. This translates into a gross land use density of 2.3 units per acre or one unit per 18,610 square feet. Currently the site of the proposal is zoned R-1 and is not served

by public water or sewer. Given these conditions, Beacon Falls' zoning regulations set a maximum development density for this site to be one housing unit per net 45,000 square feet of land.

The *Regional Plan* encourages efforts to preserve open space action areas and critical environmental areas. A concern with the proposed Chatfield Farms II development is that a majority of open space set aside in the proposal is comprised of wetlands and other undevelopable land. For subdivision developments, COGCNV staff recommends that land set aside for open space has similar characteristics to land being developed. Another concern is that amenities, including open space areas and the clubhouse are concentrated in the previously approved development. Pedestrian access between and within the two developments should therefore be a priority. An additional crosswalk and sidewalk at the central roundabout in Chatfield Farms II would better link the development for pedestrian use.

The *Regional Plan* lists four development constraint classifications. Classification is based on the soil composition, slope, presence of wetlands and flood plains, and the presence of public water and sewer infrastructure. Based on guidelines listed in Table 1, the proposed site would be classified as having a moderate or severe development constraint. Wetland areas would be classified as prohibitive.

As a general guideline, the *Regional Plan* recommends a maximum density of 0.5 units per acre for severely constrained areas with a private well and septic system. This equates to a minimum lot size of 2.0 acres. Assuming the extension of the municipal sewer line and private water system, as proposed, the *Regional Plan* recommends a maximum density of 0.67 for severely constrained areas which equates to a minimum lot size of 1.5 acres.

Additional comment from Christopher Malik, DEP, Watershed Coordinator:
It appears that a portion of the property proposed for development is depicted as Conservation Area on the town- endorsed State Plan of Conservation and Development.

The developer should accurately identify planned "Conservation Area" on the Plans and the town should adhere to its plan.

Transportation: Traffic Generation

The *Regional Plan* also recommends that land use development be coordinated with transportation planning actions. It is important to anticipate the impact on local traffic flow of the proposed development and plan improvements, if necessary.

The site will have access from Skororat Road via Chatfield Farms I and from Blackberry Hill Road via the Oakwood Estates Subdivision. Traffic, therefore, from Chatfield Farms I and II, and from Oakwood Estates will be exiting onto either Skororat Road or Blackberry Hill Road. Both are narrow and winding roads not suitable for moderate or high traffic volumes. Traffic volumes on both of these roads appear to be low, but the increase in development in this area in Beacon Falls, Seymour, and Bethany will increase the use of both roads. Common destinations for traffic will be Seymour and Beacon Falls centers, Route 8 and Route 67 in Seymour, Route 8 in Beacon Falls, and Route 63 in Bethany. Traffic should be monitored and traffic projections should also consider the effects of development in adjacent Seymour and Bethany.

The planned emergency access to Chatfield Farms I at Miller Road will need improvements. The current condition of the road would be unsuitable for emergency vehicles.

Traffic generated from the proposed housing units would mostly occur at times other than the peak periods for Skokorat Road and Blackberry Hill Road (7-9AM and 4-6PM). The Institute for Transportation Engineers (ITE) compiles traffic generation statistics for a large database of land uses in *Trip Generation 7th Edition*. For senior detached housing, including active adult, ITE found that the peak periods were 10AM– 12PM and 1PM-6PM.

The average detached senior housing unit generated 3.7 trips per day, compared to 9.6 for single-family detached housing. These trips include delivery vehicles and other services, as well as other visitors to each unit. Chatfield Farms II will contain attached housing in four unit buildings as well as single family detached homes. The actual trips per day for the development would be expected to be less than 3.7 trips per day.

At 3.7 trips per day, the 551 units of Chatfield Farms I and II would be expected to generate 2,039 trips per day. Using ITE statistics, both developments would generate 110 trips during the morning peak (10AM – 12PM) onto Skokorat Road and Blackberry Hill Road and 143 trips during the evening peak (1PM-6PM). Even fewer trips would be expected on the weekend. The table below provides a breakdown, using ITE figures, of the directional distribution of expected trips generated for the approved Chatfield Farms I and the proposed Chatfield Farms II developments.

Time Period and Day	Expected Trips Generated	Expected Trips Entering	Expected Trips Exiting
Entire Day, Weekday	2,039	1,019	1,019
Entire Day, Saturday	1,546	773	773
Entire Day, Sunday	1,268	634	634
AM Skokorat/Blackberry Hill Rd. Peak Hour, Weekday	110	41	68
PM Skokorat/Blackberry Hill Rd. Peak Hour, Weekday	143	87	56
AM Chatfield Farms Peak Hour, Weekday	170	87	83
PM Chatfield Farms Peak Hour,	193	114	79

The statistics indicate that the highest expected rate of traffic entering and exiting the developments would be 193 vehicles per hour, which would occur in the early afternoon. ITE found that the average age of residents, development location and size, affluence of residents, employment status and vehicular access are factors affecting the number of trips generated from a detached senior adult housing development.

Appendix

Contact the ERT Office for the following information:

Attachment One – Soils Information
Map One – General Soils Information

Attachment Two – Chatfield I Excerpt

Connecticut Stormwater Quality Manual DRAFT Worksheet for Use with New Land Development

About the Team

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

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

Purpose of the Environmental Review Team

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

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

Requesting an Environmental Review

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

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