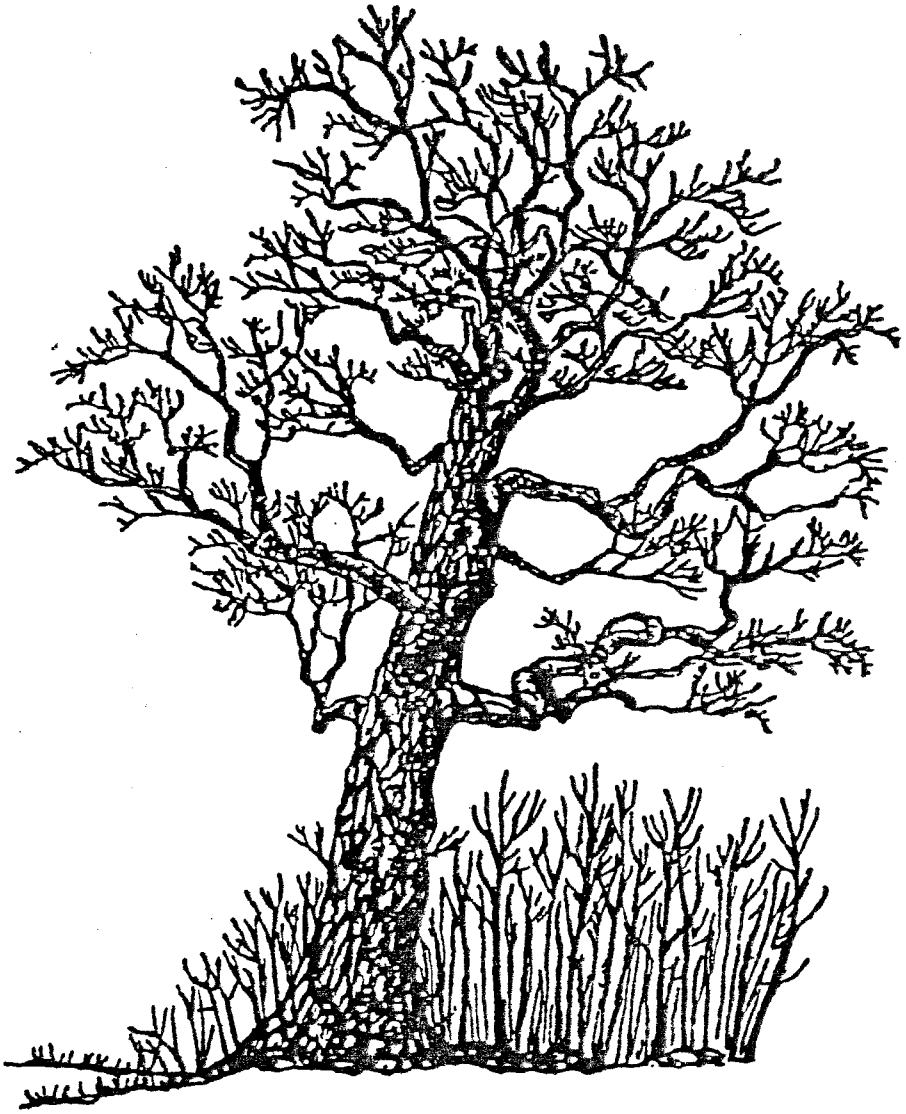
KING'S MARK ENVIRONMENTAL REVIEW TEAM



REPORT FOR

COMMUNITY HOMEBUILDERS SUBDIVISION

BARKHAMSTED,
CONNECTICUT

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

COMMUNITY HOMEBUILDERS SUBDIVISION

BARKHAMSTED, CONNECTICUT

Environmental Review Team Report

Prepared by the King's Mark Environmental Review Team
of the King's Mark Resource Conservation
and Development Area, Inc.

Wallingford, Connecticut

for the

Barkhamsted Conservation Commission

This report is not meant to compete with private consultants by supplying site designs or detailed solutions to development problems. This report identifies the existing resource base and evaluates its significance to the proposed development and also suggests considerations that should be of concern to the Inland Wetlands Commission and the Town. The results of the Team action are oriented toward the development of a better environmental quality and long-term economics of the land use. The opinions contained herein are those of the individual Team members and do not necessarily represent the views of any regulatory agency with which they may be employed.

DECEMBER 1988

ACKNOWLEDGMENTS

The King's Mark Environmental Review Team Coordinator, Nancy Ferlow, would like to thank and gratefully acknowledge the following Team members whose professionalism and expertise were invaluable to the completion of this study:

* William Warzecha, Hydrogeologist
  Department of Environmental Protection - Natural Resource Center

* Kathy Johnson, District Conservationist
  USDA - Soil Conservation Service

* Daniel Mayer, Wetland Specialist
  Department of Environmental Protection - Water Resources Unit

* Judy Wilson, Wildlife Biologist
  Department of Environmental Protection - Western District

* Don Mysling, Fishery Biologist
  Department of Environmental Protection - Western District

I would also like to thank Susan Anderson, Secretary of the King's Mark Environmental Review Team for assisting in the completion of this report.

Finally, special thanks to Raymond Fenn of the Barkhamsted Conservation Commission, Robert Judd, Barkhamsted Inland Wetlands Enforcement Officer, Joanne Thoben, Barkhamsted Planning & Zoning Commission, Donald Legeyt, landowner, Marty Brigharti and Larry Manzin, Community Homebuilders, Richard Lavieri, attorney for the developer, and David Whitney, engineer for the developer, for their cooperation and assistance during this environmental review.

EXECUTIVE SUMMARY

Introduction

The Barkhamsted Conservation Commission (Inland Wetlands Agency) has requested that an environmental review be conducted on the Community Homebuilders site, a 10.5-acre site proposed for subdivision development. The site is located in east central Barkhamsted near the Granby Town Line. Access is provided via Route 179 in Barkhamsted. The site is currently used as pasture for cows and contains a house and barn. There is some forested land in the southwest corner. A tributary to Cherry Brook and its associated wetlands runs through the property. According to the neighbors, the site is a feeding ground for wild turkey and great blue heron.

The proposed subdivision will encompass 4 house lots, each approximately 2 acres, which includes the existing house and barn. Route 179 will serve as the road for the houses. The subdivision would rely upon individual septic systems and wells.

The Town is concerned about the impact of the project on the wetlands, water quality, wildlife habitat and downstream fisheries. They are also concerned about the soil suitabilities to support the project.

The review process consisted of four phases: (1) inventory of the site's natural resources; (2) assessment of these resources; (3) identification of resource problem areas; and (4) presentation of planning and land use guidelines. Based on the review process, specific resources, areas of concern, development limitations and development opportunities were identified. The major findings of the ERT are presented below:

Setting and Land Use

The site is located in eastern Barkhamsted near the Canton and Granby Town Lines. The site is zoned RA-2. Historically, the property has been used for agriculture. Surrounding land uses include residences and some scattered agriculture.

Topography

The site is located in a narrow valley. The land slopes moderately to the streamcourse. Maximum and minimum elevations range from 1,000 to 940 feet above sea level, respectively.

Geology

The bedrock that underlies the site has been identified as a calc-silicate zone of the Hartland Formation. The property is located on the west flank of the South Granby Dome. The Barkhamsted Fault bisects the Barkhamsted Reservoir 2 miles away. The fault is a structural feature formed in the past and is believed to be inactive. The bedrock underlying the site is the major aquifer. The wells proposed to

serve the development will be drilled into the bedrock. Overlying the bedrock is a glacial sediment known as till. The till is characterized by a shallow "hardpan" layer. The hardpan impedes the downward flow of water and can be an impediment to septic systems and basements.

The regulated inland wetland soils have been identified and placed on the maps. The development activity will take place on the east side of the stream, minimizing the potential for disturbance. Also, a 50' non-disturbance zone is proposed. The types of activities permitted in this zone should be clarified.

Sewage Disposal System

Detailed soil testing has been performed. The bedrock was not encountered in any of the deep test holes. Percolation tests reveled acceptable rates. The most important design constraint will be the seasonally high water table. Sewage disposal reports indicate that subsurface conditions are suitable and that engineered septic systems are required. Before subdivision approval, the applicant must show that the lots meet the minimum soil standards set out in the Public Health Code.

Water Supply

The underlying bedrock is the likely source of water for the subdivision. Water from any given well is dependent on the number of fractures in the bedrock that the well intersects. Due to the low density of the development there should be little change in the aquifer recharge. The availability of water from the bedrock should be sufficient for domestic use. The quality of the ground water should be good. The groundwater is class GA. There may be a chance of elevated iron and manganese levels as well as elevated hardness levels, which may necessitate appropriate treatment systems.

Hydrology

The entire site lies within the drainage of the unknown streamcourse that bisects the site. The water is designated class A. The subdivision will lead to some increases in runoff, however the density is so low that peak flows should be negligible. The large depressional area has ample runoff storage capabilities. The detention functions of the detention basin may not be necessary. The sediment retention functions are needed for the road drainage and erosion and sediment control.

Soil Resources

The soils on the property are mapped in the Litchfield County Soil Survey. Recommendations to improve the sediment and erosion control plan include carrying the drainage pipe to the toe of the slope, rock lining the outlets to the curtain drain,.installing a subsurface drainage pipe for the east side of the detention pond, providing hydraulic calculations to the Town and defining the responsibility for maintenance of the detention basin.

Wetland Considerations

The wetlands/watercourse on the site is classified as Palustrine; forested; broad leaved deciduous; seasonally saturated by the Fish and Wildlife Service. The site is in the upper reaches of the watershed. The watercourse collects and conveys surface water and acts as a wildlife corridor. The rocky streambed helps to increase the dissolved oxygen levels which aid in the breakdown of nutrients. The wetlands bordering the stream also act to filter and renovate the flow into the stream, Wetland functions include drainage, wildlife habitat, sediment and water filtration, and nutrient reclamation.

Due to the low density and mitigation measures proposed by the developer, the potential for adverse impacts is reduced. The houses and septic systems are setback from the wetlands. A detention basin is proposed to collect stormwater runoff and allow sediments to settle. A non-disturbance zone is proposed for the eastern side of the wetlands. The Commission might want to include conditions in the permit that set out specific activities that may or may not occur in the zone. Also the Commission should consider extending the zone to the west side of the wetlands.

Wildlife Resources

Habitat on the site includes pasture/open fields, shrub and herbaceous growth, hardwoods and conifers. The area offers a variety of food and cover to wildlife including deer, turkey, grouse, raccoon, fox, mice, various birds reptiles and amphibians. Because the slope faces southeast, it receives maximum sunlight. This causes snow to melt early in the spring, which enables turkeys to utilize these areas for feeding. The site offers good to excellent wildlife habitat.

As with any development, the impact on wildlife habitat will be negative. Wildlife habitat will be broken up and lost with the construction of roads, driveways, walkways, parking areas and homes. Other impacts include the creation of lawns and the presence of humans, traffic, dogs and cats.

There are many steps that can be taken in order to make the area more suitable for wildlife. These include buffer strips, natural landscaping techniques, maintaining forest wildlife requirements and providing nesting boxes for birds.

Fishery Resources

The fishery resources of Cherry Brook are unique. The brook supports Atlantic salmon and slimy sculpin as well as brown and brook trout. Development in the watershed needs to be done with extreme care. Recommendations include a comprehensive sediment and erosion control plan and limiting the use of lawn chemicals near the stream. The importance of properly maintained septic systems should be impressed on the homeowners.

Threatened and Endangered Plant and Animal Species

According to the DEP - Natural Diversity Database there are no Federally listed Endangered Species or Connecticut "Species of Special Concern" found within the study area.

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INTRODUCTION

The Barkhamsted Conservation Commission (Inland Wetlands Agency) has requested that an environmental review be conducted on the Community Homebuilders site, a 10.5-acre site proposed for subdivision development. The site is located in east central Barkhamsted near the Granby Town Line. Access is provided via Route 179 in Barkhamsted.

The site is currently used as pasture for cows. There is a house and barn on the property. There is some forested land in the southwest corner. A tributary to Cherry Brook and its associated wetlands runs through the property. According to the neighbors, the site is a feeding ground for wild turkey and great blue heron.

The proposed subdivision will encompass 4 house lots each approximately 2 acres, which includes the existing house and barn. Route 179 will serve as the road for the houses. The subdivision would rely upon individual septic systems and wells.

The Town is concerned about the impact of the project on the wetlands, water quality, wildlife habitat and downstream fisheries. They are also concerned about the soil suitabilities to support the project. Specific objectives include:

1) Assess the hydrological and geological characteristics of the site, including geological development limitations and opportunities, natural drainage patterns, post-development stormwater runoff potential, and flooding;

2) Determine the suitability of existing soils to support the proposed development;

3) Discuss soil erosion and sedimentation concerns;

4) Assess the impact of the development on the wetlands and water quality; and

5) Assess the impact of the development on the wildlife and fishery habitats.

Figure 1

LOCATION OF STUDY SITE

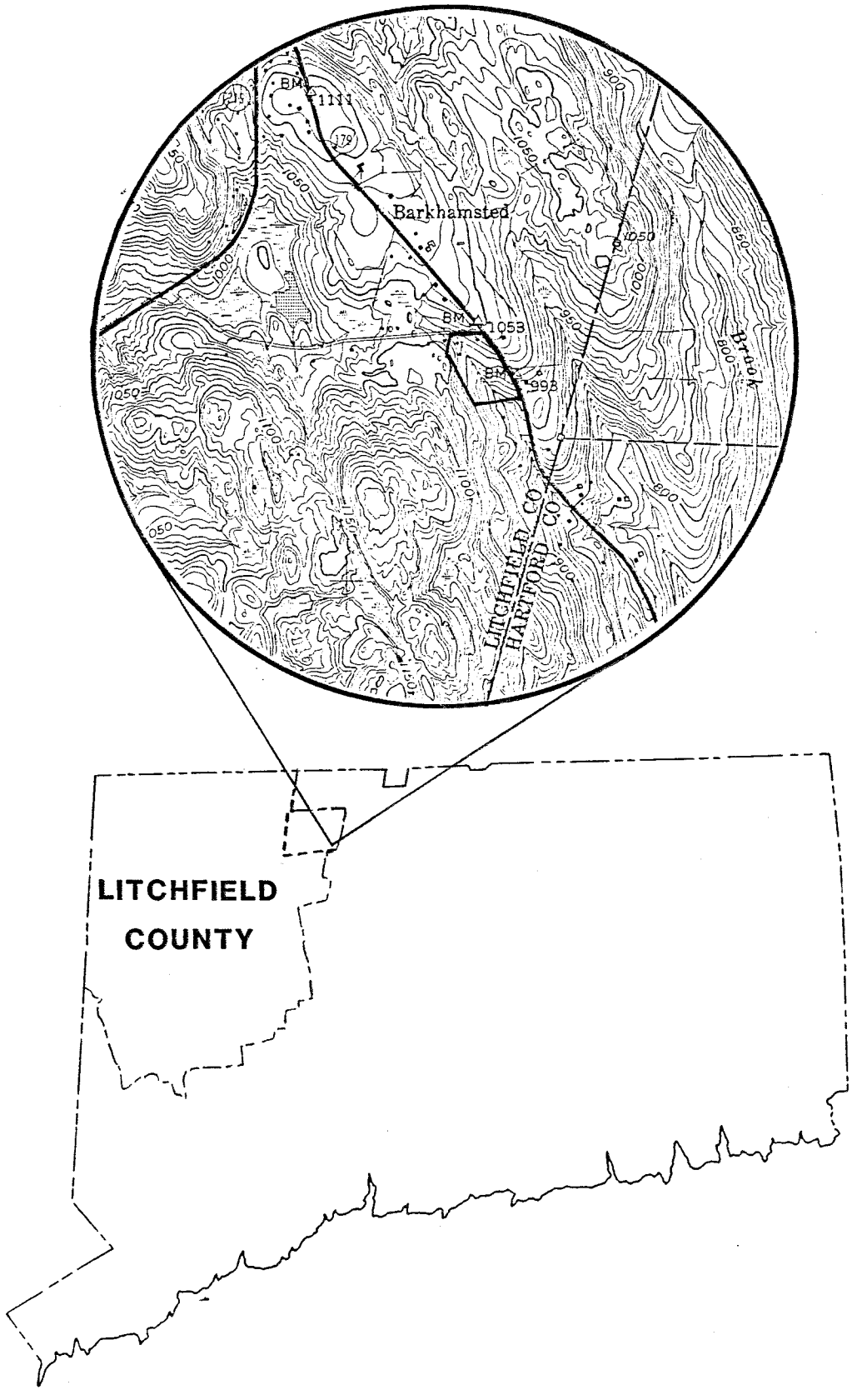


Figure 2

SITE DATA

Site is located in Residence Zone RA-2

Total area of site	= 10.6 acres
Number of Proposed lots	= 4 lots
Minimum lot area	= 87,120 sq.
Minimum frontage required	= 200'
Minimum front yard required	= 65'
Minimum side yard required	= 40'
Minimum rear yard required	= 50'
Maximum building height	= 35'
Minimum floor area	= 750 sq. ft.

TOTAL FRONTAGE ON ROUTE # 179

LOT #	
1	260.00'
2	202.46'
3	208.48
4	225.45'

GENERAL NOTES

1. Property lines, dimensions and miscellaneous information taken from subdivision plan (December 1987) prepared by Nasciabeni and Johns Surveyors, Avon, Connecticut.
2. Topography taken from field survey (August 1987) by Nasciabeni and Johns Surveyors, Avon, Connecticut.
3. Water supply by individual on-site wells.
4. Sanitary effluent disposal by individual on-site subsurface septic systems. The septic systems shall be designed by a professional engineer licensed in the State of Connecticut and must be installed in accordance with the Connecticut Public Health Code.
5. All utilities shall be underground.
6. All lot corners shall be pinned.
7. The proposed locations of houses, driveways, septic systems and wells as indicated in these plans are shown to determine the feasibility of each lot for development only and are not final lot layouts.
8. The maximum grade for each driveway on all of the lots shall be 12.0%.
9. The developer shall be responsible for obtaining all necessary permits as required by the Connecticut D.O.T.

PROPOSED RETENTION BASIN
SEE DETAILS - SHEET #2 OF 2
BOTTOM OF BASIN = EL. 787.00
BOTTOM DIMENSIONS = 15' x 90'
TOP OF BERM = EL. 790.00
10' WIDE EMERGENCY SPILLWAY = 789.50

N/E JOHN WIEDERHULD, CO INC

N/E B. SCHILDHABEL

N/E MARJORIE CASE

HILLCREST DRIVE

EXISTING DRIVE

EXIST HOUSE

EXIST BARN

POND

WETLAND LIMITS

LIMITS OF WETLANDS SOILS AS DELINEATED IN THE FIELD BY S.S.S. & E.S.M.S. SOILS SCIENTISTS, AND FIELD LOCATED BY NASCIABENI & JAHNEL SURVEYORS

HAY BALES/SILT FENCE

100' NON DISTURBANCE

SILT FENCE/HAY BALES

UNRESTRICTED RIGHT TO DRAIN

RESERVE

PRIMARY

EASEMENT

EXISTING FENCE

EXISTING STONE WALL

EDGE OF PAVEMENT

INSTALL HAY BALES OR SILT FENCES AS REQUIRED DURING CONSTRUCTION TO CONTROL EROSION AND SEDIMENTATION, SEE DETAIL SHEET #2 OF 2.

CUT BACK VEGETATION AND GRADE BANKS AS REQUIRED TO PROVIDE ADEQUATE SIGHT LINES. SIGHT LINES TO BE APPROVED BY THE TOWN ENGINEER. (TYPICAL ALL DRIVEWAYS)

TYPICAL PROPOSED DRIVEWAY. MAXIMUM GRADE = 12%. MINIMUM WIDTH = 10 FT. PAVED AREA IS REQUIRED 10 FT. MIN. FROM EDGE OF ROAD.

PROPOSED M.H. CONSTRUCT M.H. AT EXISTING PIPE OUTLET TO D.O.T. STANDARDS

PROPOSED M.H. CONSTRUCT M.H. AT EXISTING HEADWALL (TO D.O.T. STANDARDS)

BENCH MARK
CL&P #2351
ELEV = 977.84

1 ± 9.00 AC. 4,791,423 SF

2 ± 7.02 AC. 87,803 SF.

3 ± 2.28 AC. 99,366 SF.

4 ± 2.37 AC. 103,398 SF.

LEGEND

- Proposed House
- Septic System
- Reserve Area
- Proposed Underdrain
- Deep Pit
- Percolation Test
- Proposed Well
- Existing Stone Wall
- Existing Fence

COMMUNITY HOMEBUILDERS SUBDIVISION

BARKHAMSTED, CONNECTICUT

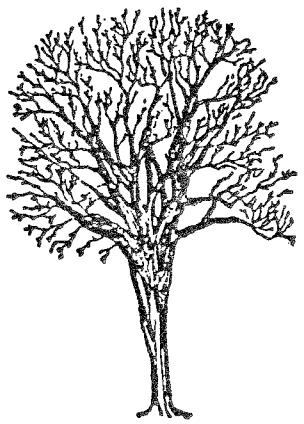
King's Mark Environmental Review Team

Scale: 1" = 80'

Proposed Site Plan

Information from David Whitney, Engineers, Feasibility Site Plan

PHYSICAL CHARACTERISTICS



SETTING AND LAND USE

The site, about 10.5 acres in size, is located in eastern Barkhamsted near the Canton and Granby Town Lines. The site abuts Route 179 on the east, Hillcrest Drive on the north, private, undeveloped land on the west and residential property on the south.

According to Town officials, the site is located in a residential zone referred to as RA-2. Residential building lots, which are a minimum of 2 acres in size, are permitted in the zone. Present plans indicate that a 50-foot non-disturbed area will be maintained between the mapped wetland boundaries on the site and construction activities which will take place on the east side of the property.

The site has historically been used for agricultural purposes. The site is currently used as pasture for cows. The eastern two thirds of the site is open field, while the western parts are wooded. Land use in the area is largely low-density residential. Additionally, there are scattered agricultural land uses in the vicinity.

TOPOGRAPHY

The site is located within a narrow valley, which conveys a small intermittent streamcourse to an unnamed tributary to Cherry Brook. Land surface throughout the site slopes moderately to the streamcourse. Site elevations range from about 1,000 feet above mean sea level at the northern limits to about 940 feet above mean sea level at the intersection of the streamcourse and the southern property line (see Figure 3). The difference in relief is about 60 feet.

GEOLOGY

Bedrock was not exposed at the ground surface during the field review. Geologic mapping data identifies the bedrock underlying the site as a calc-silicate zone in the Hartland Formation (see Figure 4). It is described as a medium grained brownish-gray to medium gray schist composed primarily of the minerals quartz, plagioclase and muscovite. In addition, the rock is characterized by: (1) a zone of calc-silicate rock, which is fine to medium grained, light-greenish-gray and composed of the minerals quartz, plagioclase, clinozoisite, epidote, microcline and calcite; and (2) fine to medium grained dark-greenish-gray to black amphibolite in thin beds and lenses, which is composed of the minerals hornblende, biotite and garnet.

Regionally, the site is located on the west flank of the South Granby Dome, an area of uplifted rocks. The Barkhamsted Fault, which bisects Barkhamsted Reservoir in a north/south direction, lies about 2 miles west of the site. Due to the site's relatively close proximity to the zone of uplifted and faulted rocks, it is expected that the upper few hundred feet of the bedrock is fractured (i.e., contains cracks and openings). The fault zones are structural features which formed during the geologic past and are no longer believed to be experiencing active movement.

The underlying bedrock is the major aquifer (geologic formation capable of supplying usable amounts of water for drinking purposes) on the site. Most homes in Barkhamsted rely on the underlying bedrock as a source of domestic water. It seems likely that the proposed subdivision would be served by individual on-site wells drilled into the underlying crystalline, metamorphic rock.

The entire site is covered by a glacial sediment called till (see Figure 5). The till, which consists of ground-up rock material, was plastered by moving glacial ice on a core of crystalline bedrock. The till that covers the site is characterized by a relatively shallow "hardpan," which is located below the weathered and rooted surficial soil

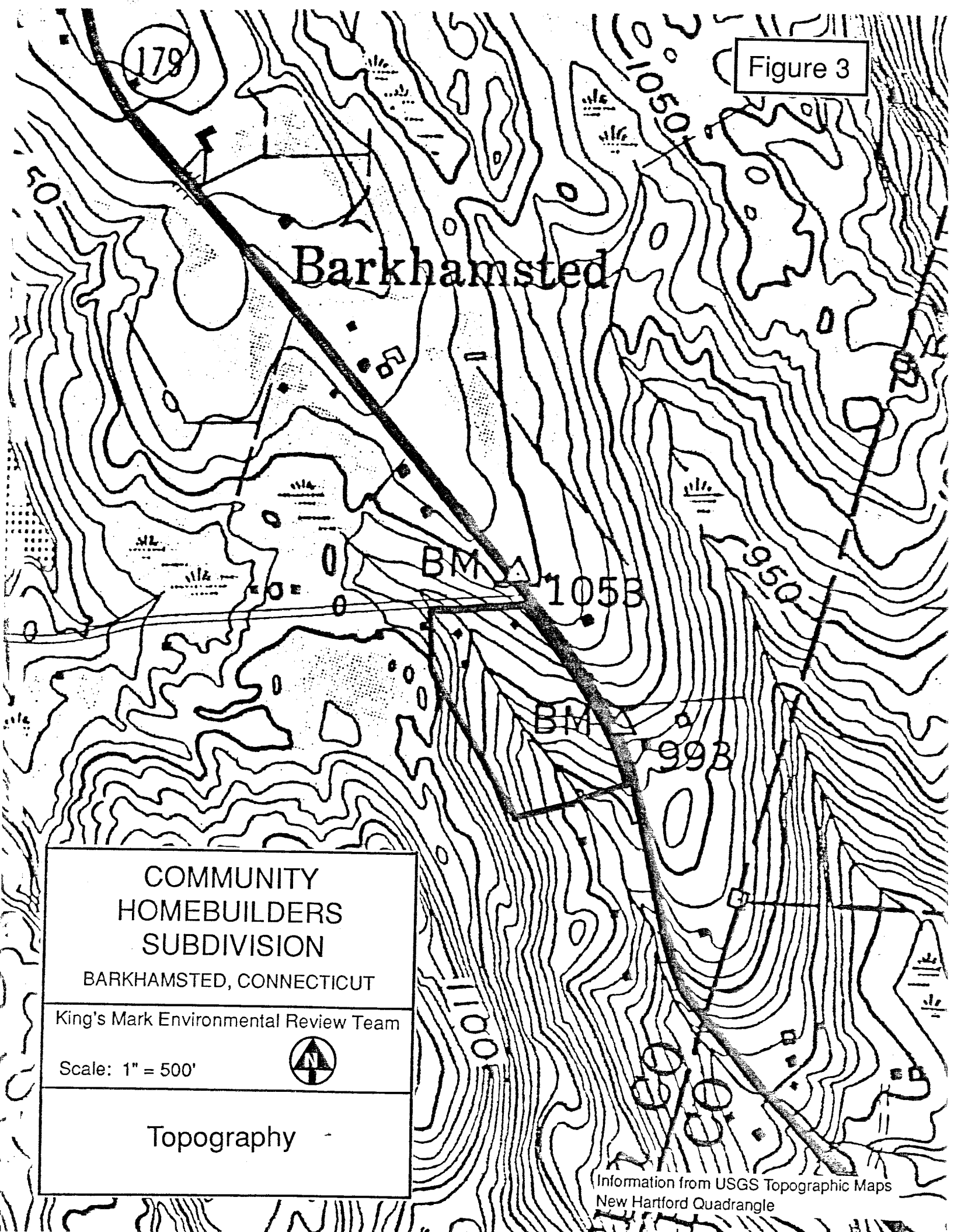


Figure 3
179
Barkhamsted
1050
950
1100
BM
105B
BM
99B
COMMUNITY
HOMEBUILDERS
SUBDIVISION
BARKHAMSTED, CONNECTICUT
King's Mark Environmental Review Team
Scale: 1" = 500'
N
Topography
Information from USGS Topographic Maps
New Hartford Quadrangle

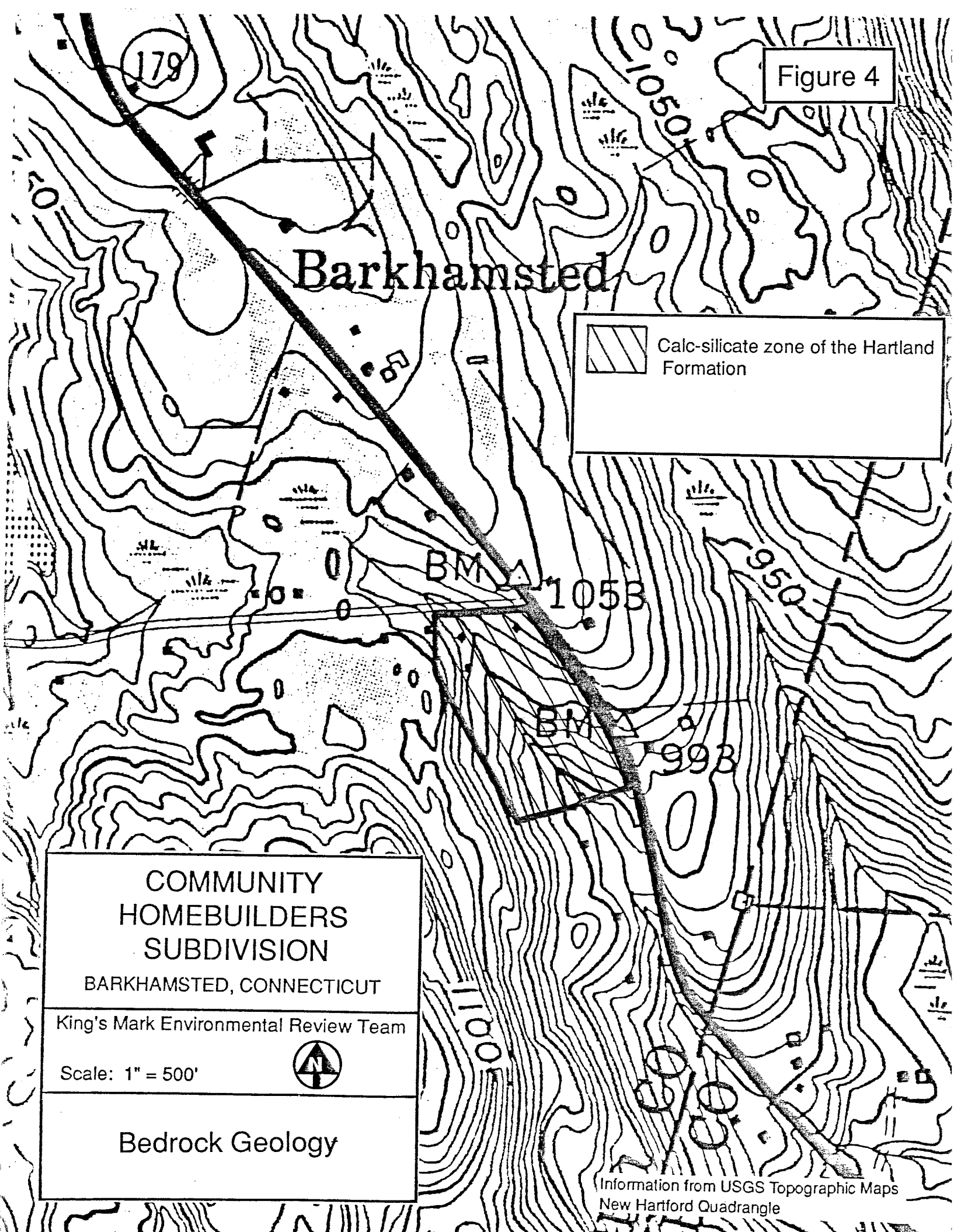


Figure 4
179
Barkhamsted
1050
950
1100
BM
1058
998
Calc-silicate zone of the Hartland Formation
COMMUNITY HOMEBUILDERS SUBDIVISION
BARKHAMSTED, CONNECTICUT
King's Mark Environmental Review Team
Scale: 1" = 500'
N
Bedrock Geology
Information from USGS Topographic Maps
New Hartford Quadrangle

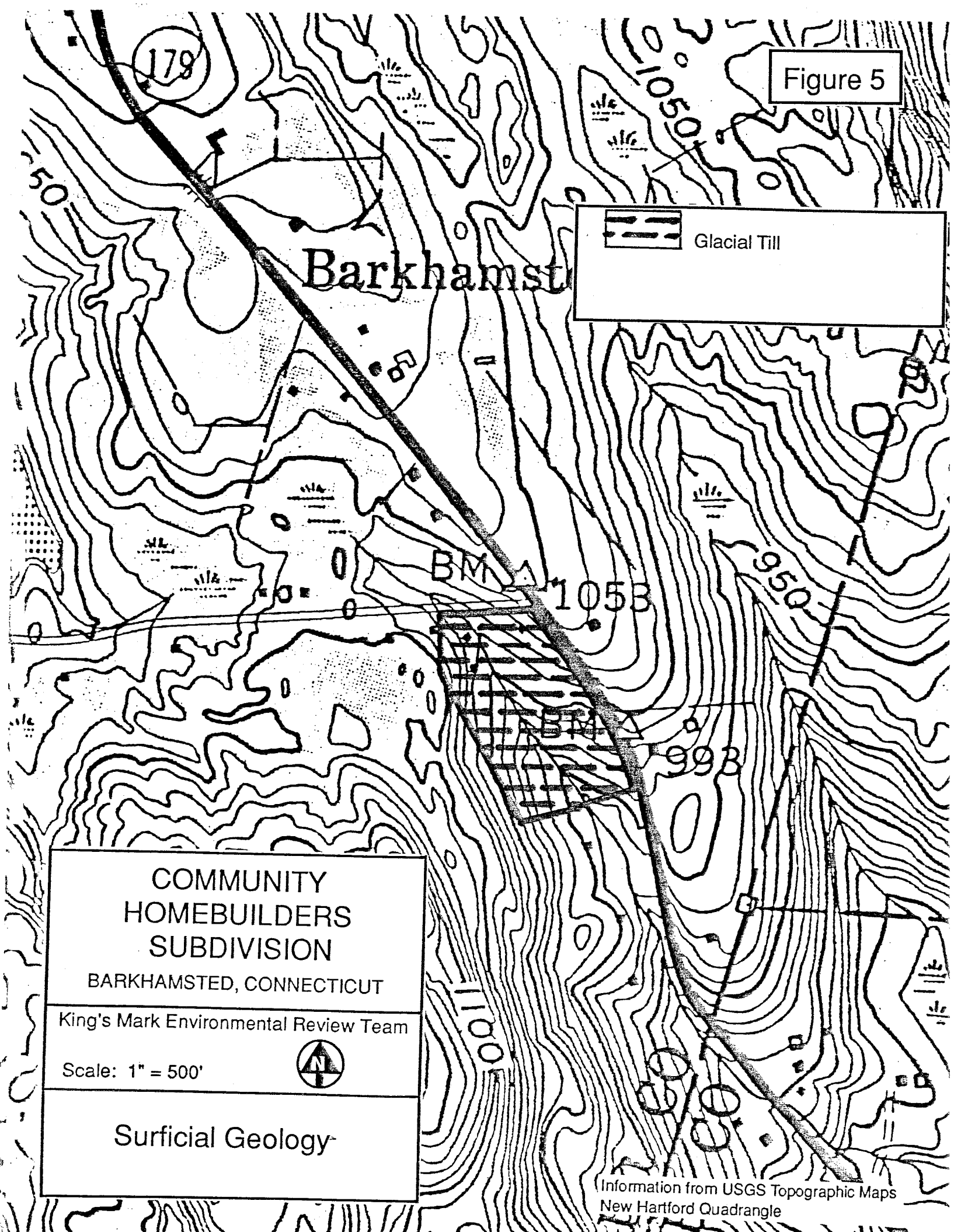


Figure 5
Glacial Till
Barkhamsted
BM
1058
BM
998
179
1050
950
1100
COMMUNITY
HOMEBUILDERS
SUBDIVISION
BARKHAMSTED, CONNECTICUT
King's Mark Environmental Review Team
Scale: 1" = 500'
N
Surficial Geology
Information from USGS Topographic Maps
New Hartford Quadrangle

zone. Soil testing for on-site sewage disposal confirms the presence of a compact soil zone ranging between 16 and 24 inches on the parcel. Geologists call this "lodgement" till. Because of the compact nature of the "hardpan," the soil has a very low vertical permeability. During periods of heavy rainfall, the "hardpan" impedes the downward movement of groundwater resulting in a seasonally high water table. Without proper planning and engineering, a seasonally high water table condition can be a major hindrance in terms of on-site sewage disposal and wet basements.

Regulated inland-wetland soils have been field checked by a certified soil scientist and their boundaries superimposed on the subdivision plan. They principally parallel the intermittent streamcourse in the central parts. Based on present plans, all development activity will take place on the east side of the parcel thereby minimizing the potential for wetland disturbance. Additionally, a 50' non-disturbance zone that extends from the eastern edge of the mapped wetlands is shown on the plans. It is unknown what type of activity would be permitted in the non-disturbance zone. This should be clarified for the Town and future homeowners.

SEWAGE DISPOSAL SYSTEM

Detailed soil testing for on-site sewage disposal has been performed on the subdivision site by Roger H. Whitney, Inc., Consulting Engineers. A representative of the Farmington River Health District, of which the Town is affiliated, observed the deep test holes and percolation tests. This work involved numerous deep test holes that generally ranged between 5.5 feet and 8.5 feet. In general, soil profiles consisted of a topsoil layer, a weathered and rooted sub-soil layer from 0.5 foot to 1.5 feet and then hardpan. The bedrock surface was not encountered in any of the deep test holes on the site. Percolation tests conducted on the site revealed acceptable rates, which

indicated moderately drained soils. Shallow mottling, an indicator of a seasonally high water table, was found in a couple of test holes.

From a subsurface sewage disposal standpoint, it appears that the most important design constraint will be the presence of a seasonally high water table due to the restrictive "hardpan" layer present throughout the site.

The subsurface sewage disposal report prepared by Roger H. Whitney, Inc., Consulting Engineers, indicates that subsurface conditions are suitable for the installation of on-site septic systems but that engineered systems would be required. Each system will need to be fairly large, filled and raised. Present plans indicate that each system will be protected by curtain/building/footing drains, which will intercept groundwater in the area and transport away from the leaching field. The purpose of a curtain drain is to assure that the seasonal high water table does not rise up into the leaching system and impair its hydraulic capacity.

Before subdivision approval, the applicant's engineer must show that each of the proposed lots in the subdivision meets the minimum soil standards set forth in Section 19-13-B103e(a) (3) of the Public Health Code. Each system should be able to hydraulically disperse the expected discharge into the site's natural soil layers per Section 19-13-B103e(a) (4) of the Code. The proposed primary and reserve leaching areas are setback at least 60 feet from the streamcourse bisecting the site. The State Public Health Code (Technical Standards) requires a 50 foot setback from open water.

WATER SUPPLY

Based on review of hydrogeologic data, the principal aquifer on the site is the underlying crystalline, metamorphic rock. Wells drilled in bedrock generally supply small but reliable yields of groundwater that fill the fractures (cracks and seams) in the rock. Since the yield of a given well depends upon the number and size of water

bearing fractures that it intersects, and since the distribution of the fractures is irregular, there is no practical way of predicting the yield of a well in a specific location, outside of drilling the well,. However, experience has shown that most fractures generally occur within the first few hundred feet of the bedrock surface. The probability of increasing the yield of a well usually decreases with depths below 300 feet.

Because of the low-density development proposed and 2-acre minimum building lot size, the proposed subdivision will cause little change in recharge to the bedrock aquifer. The creation of impervious surfaces should be minimal.

Using some basic assumptions, the Team's geologist evaluated available recharge and predicted water use of the subdivision to estimate the potential impact on the bedrock aquifer. Specifically, recharge calculations show that the amount of water available to the site each day is about 6,250 gallons per day. This is based on groundwater recharge amounts of 8 inches per year for an upland site and 10.5 pervious acres, allowing for infiltration. Predicted water use at the site is estimated at 900 gallons per day. This is based on a 75 gallons per day per capita water usage. An assumption of 4 persons per single family residence was used.

Based on these figures, it is estimated that the planned development will receive about 7 times the recharge as is necessary to balance water demand. In addition, induced recharge by properly renovated septic system effluent plays important role in the groundwater budget. This stresses the need for properly designed and installed septic systems.

Each well should ideally be located on a relatively high portion of lot, properly separated from the sewage disposal system or any other potential pollutant (e.g., fuel oil storage tank, etc.) and in a direction opposite the expected direction of groundwater movement. They should all be cased with steel pipe into the underlying bedrock. In order to provide adequate protection of the quality of bedrock water, all

wells will need to be properly installed in accordance with all applicable State Public Health Code and Connecticut Well Drilling Board regulations. In addition, the Town sanitarian for the Health District will need to inspect and approve well locations.

Present lot layout allows for a spacing of about 200 feet between domestic wells in the proposed subdivision. This should help to minimize the chances for mutual interference.

In the Farmington River basin, wells tapping crystalline bedrock (i.e., gneisses, schists, etc.) were surveyed from Connecticut Water Resources Bulletin, No. 29. Of these, approximately 90 percent yielded 1 gallon per minute or more; 50 percent yielded 5 gallons per minute; and only 10 percent yielded 32 gallons per minute or more. A well yield of 3 gallons is generally satisfactory for most domestic uses.

A review of some recent well completion reports for homes constructed on Hillcrest Drive north of the proposed subdivision reported yields of 1 and 2 gallons per minute. The wells were drilled to a depth of 247 feet and 325 feet, respectively.

The natural quality of groundwater should be satisfactory. However, the bedrock beneath the site may have elevated amounts of iron and/or manganese minerals, which could lower the overall quality. Additionally, the presence of calc-silicate zones in the bedrock may affect the hardness levels of the water. In either case, there are suitable treatment filters available to ameliorate these potential water quality concerns.

Groundwater in the area is classified by the Department of Environmental Protection (DEP) as GA, which means that it is suitable for private drinking water supplies without treatment.

HYDROLOGY

The entire site lies within the drainage area of the unnamed streamcourse that bisects the site. This streamcourse, which flows north to south, originates in a wetland area north of Hillcrest Drive. Surface and groundwater flow on the site is towards the streamcourse. At its intersection with the driveway that accesses the Case property to the south, the streamcourse drains an area of about 66 acres (see Figure 6). The site, therefore, represents about 16 percent of this drainage area. Once the streamcourse leaves the property, it flows to an unnamed tributary to Cherry Brook.

The surface water in the unnamed streamcourse on the site is designated as Class A by the DEP. This means these waters are presently uncontaminated, suitable for human consumption and treated wastewater discharges are not allowed.

The subdivision of the property as planned, followed by the construction of new homes and driveways will lead to some increases in runoff from the property. However, since the overall density of the subdivision is so low, any peak flow increases would be negligible. The large, depressional area just south of the property has more than ample natural runoff-control capabilities to handle any increases in runoff from the site. Therefore, the detention function of the basin may not be necessary. Since the basin will primarily serve a sediment retention function, there will be a need for maintenance of the basin, . Road drainage, which will contain road sand spread during winter months on Route 179, will be piped to the basin.

Another concern associated with increases in runoff is the potential for erosion and siltation problems. In view of the moderate slopes, silty soils and the close proximity of the construction area to the streamcourse/wetland system on the site, there is a need for a comprehensive erosion and sediment control plan. Disturbed areas should be kept to a minimum under such a plan. Town officials need to check

erosion and sediment control structures on the site to ensure that they are functioning properly and protecting the nearby streamcourse from silt-laden water.

SOIL RESOURCES

The soils on the property are mapped in the Litchfield County Soil Survey (1970) as CrD, Lg and PbC. These soils are described below:

1) The Lg soil is an inland wetland soil type. This area has been delineated in the field by a soil scientist and is shown on the Feasibility Site Plan sheet 1 of 2 dated 7/7/88. The soil scientist should be on record stating this map is substantially correct.

2) The PbC soil is a well drained soil with a dense layer (hardpan) at about 24 inches in depth. This hardpan can cause engineering limitations on septic system design and cause a slow percolation rate. Cut slopes in this soil are likely to have seeps flowing out during wet periods and subsurface drainage may be required.

3) The CrD soil is a well drained, very stony soil on very steep slopes. Slope is the most limiting feature of this soil for development. The erosion hazard on this soil is high due to the steep slopes.

These soil mapping units are further described in the Soil Survey of Litchfield County, (1970). Tables 1 through 3 in Appendix A of this report summarize the soil conditions on-site.

Erosion and Sediment Controls

The following comments/recommendations refer to the erosion and sediment control plan described on the Feasibility Site Plan (1 of 2) and Detail Sheet (2 of 2) dated 7/7/88.

1) The storm drain pipe outlet between Lots 3 and 4 and the detention pond outlet pipe should be carried to the toe of the slope. If outlets remain where shown, a stable channel should be designed to carry water over the slope to the watercourse. The storm drain easement should be extended accordingly.

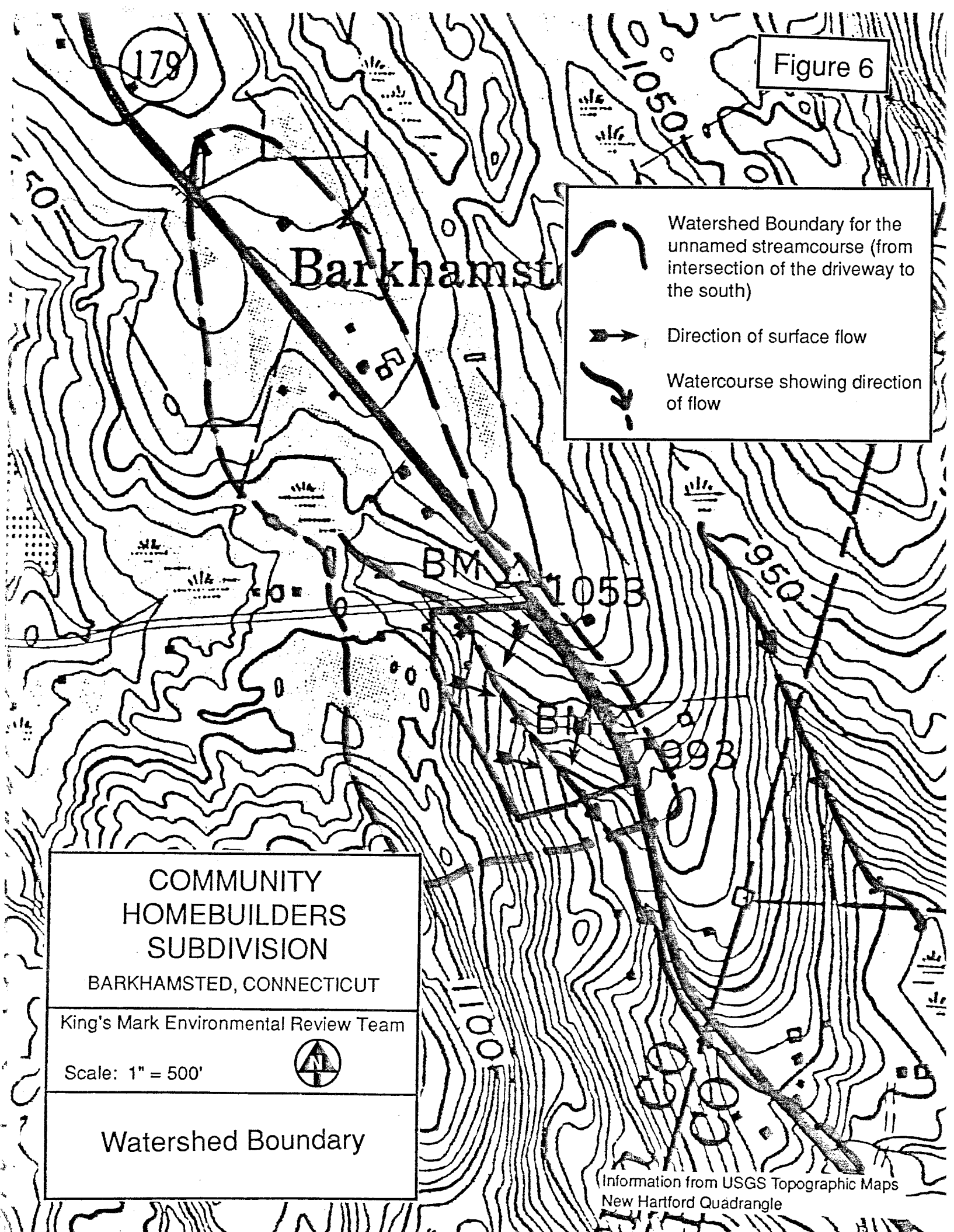


Figure 6
179
1050
Barkhamst
Watershed Boundary for the unnamed streamcourse (from intersection of the driveway to the south)
Direction of surface flow
Watercourse showing direction of flow
BM
1058
950
BM
998
1100
COMMUNITY HOMEBUILDERS SUBDIVISION
BARKHAMSTED, CONNECTICUT
King's Mark Environmental Review Team
Scale: 1" = 500'
N
Watershed Boundary
Information from USGS Topographic Maps
New Hartford Quadrangle

2) The curtain drains from Lots 3 and 4 could use the same rock lined outlet as the storm drain pipe, reducing the amount of rock needed.

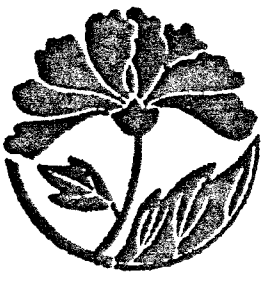
3) The east side of the detention pond is excavated into the ground. Some ground seepage may be encountered in this cut bank, causing soil erosion. A subsurface drainage pipe could help alleviate this situation.

4) Hydraulic calculations should be supplied to the Town showing pre- and post-development runoff (recommended storms are the 2, 10 and 100 year, 24 hour, type III storms). This data should be reviewed by a professional engineer.

5) Responsibility for the drainage system and detention basin maintenance should be clarified. The embankment of the detention pond should be maintained free of trees and shrubs.

6) Sediment should be removed from the detention basin periodically so that the capacity is not reduced, and outlet pipe is not buried.

BIOLOGICAL RESOURCES



WETLAND CONSIDERATIONS

Wetland and Watercourse Description and Function

The parcel of land under review is approximately 10.5 acres in size and has been divided into four proposed house lots. Lot 1, at the north end of the site, contains an existing house and barn. There is a wetland/watercourse corridor which runs from north to south through the entire site, and bisects all of the lots roughly in half. All of the proposed structures and septic systems are located on the eastern half of each lot. The wetlands system is composed mainly of a complex of Leicester, Ridgebury and Whitman soils (Lg). As defined by the U.S. Fish and Wildlife's National Wetland Inventory, the wetlands on site are classified as follows:

PFOlE - Palustrine, forested, broad-leaved deciduous, seasonally saturated.

The portion of the watercourse which crosses the site is in the upper reaches of the watershed. The watercourse mainly acts to collect and convey surface waters, and thus creates a natural wildlife corridor. The stream channel itself is quite rocky and possesses a series of small cascades which help to increase the dissolved oxygen level within the water and enhances the ability to breakdown and process organic and nutrient loads which may enter into the system. At present the area surrounding the watercourse is used for grazing by a small number of cattle. The cattle contribute greatly to the nutrient flows presently entering the stream. The wetland areas bordering the stream act as a filtration and renovation system for any waters which ultimately flow into the stream. There does not appear to be much, if any, water storage capacity on the site due to the rather steep slopes. Aesthetically, the system and the whole site offer some value. Recreational and educational opportunities are limited due to location, ownership and present use. Overall, the

wetland and watercourse system is of good quality and functional capacity.

Development Impacts

Due to the low density of proposed lots and a combination of several other mitigation measures which are being proposed by the developer, the potential for adverse impacts to the wetlands is greatly reduced. There is no new development proposed for Lot 1, and there did not appear to be any existing situations on this lot which were causing any wetland impacts. Lots 2 and 3 contain two house sites with septic systems and a retention basin. Both of the house sites are well over 100 feet from the border of the wetlands and do not pose any significant threat of impacts provided that best management practices are used during construction activities. The primary septic fields are both at least 60 feet back from the wetlands, and the reserve fields are a minimum of 50 feet back. The plans indicate that underdrains will be installed uphill from all of the proposed septic systems to ensure that subsurface runoff will not interfere with septic operation.

A small retention basin is proposed at the rear of Lot 2 and will collect surface runoff and road drainage being culverted to the rear of the lot. The basin will also serve to settle out sediments which will be carried in the water, and will probably need to be cleaned out on a regular basis (every one or two years) in order to remain functional. Lot 4, at the southern end of the property, also contains a building site and septic system, both approximately 90 and 50 feet back from the wetland boundary, respectively. The outlet structures, for two underdrains and a road drainage culvert, which are proposed between Lots 3 and 4, appear to be adequately designed. These systems should be installed prior to commencing any house or septic construction activities in order to reduce the risk from sediment and erosion problems.

The developer has proposed a 50-foot non-disturbance zone along the eastern border of the wetlands. The Commission may want to include conditions within the wetland

permit which will indicate the specific types of activities which may or may not occur within this zone. The maintenance of this area, in its present condition, will create an effective buffer to any potential impacts which may occur on the lots in the future. Additionally, the Commission should consider establishing a similar non-disturbance zone along the western border of the wetlands. Overall, it does not appear that significant impacts will occur to the wetlands in light of their present condition and the mitigative measures which have been proposed within the application.

Comments and Recommendations

1) The proposed non-disturbance zone should be extended to both sides of the wetland system. The wetland permit should indicate exactly what activities may or may not occur within those areas, (i.e. no chemical fertilizers, landscaping or clearcutting, no building of structures, etc.).

2) The Commission should solicit input from either the Farmington Valley Health District or the State Department of Health concerning the design and engineering integrity of the septic systems.

3) Specific conditions concerning the cleaning and maintenance of the detention basin on Lot 2 should be agreed upon. If the Town of Barkhamsted undertakes this responsibility, some form of access or right of way to the retention basin should be established. If the responsibility of cleaning and maintenance is given to the developer or the future lot owner, some sort of performance bond should be designated.

4) Overall, the proposed project seems to incorporate significant mitigative measures with respect to wetland protection and should not pose a serious threat to the wetland area if best management practices are used during the construction phase.

WILDLIFE CONSIDERATIONS

Description of Area/Habitats

The 10.5-acre site proposed for development primarily consists of pastureland with a portion of hardwood and softwood forest in the southwest corner. The site is situated on a south-easterly facing side hill. There is a portion of hardwood forest and a small stand of conifers, composed mainly of hemlocks. contained within the site

Because of the diversity of habitats contained on the site, including the open field/pastureland, the stream with shrub and herbaceous growth, the hardwoods and conifers. the area offers a variety of food a cover to a variety of wildlife. This area probably gets some use by wildlife including such species as deer, turkey, grouse, raccoon, fox, mice, various birds, reptiles and amphibians. Wading birds such as the great blue heron are probably seen in the area (as reported in the request for the ERT) because of the small ponds located adjacent to the property.

The field/pasture areas provide insects and grass seeds for food, for such species as the turkey and the shrub growth along the stream provides food for deer, grouse, turkey, and various song birds such as the mockingbird. The conifers offer cover for species like the grouse and food (seeds) for chickadees and pine siskins. The hardwoods on the site also provide food and cover to a variety of wildlife.

Because this slope faces southeast, it receives almost maximum available sunlight, even during the winter. The increased sunlight would tend to melt the snow during warm spells in the winter and in the spring. Because of this, some species of wildlife like the turkey utilize these areas to feed. This factor combined with the pasture/old field habitat partially accounts for the reported use of this area by turkeys. This area offers good to excellent wildlife habitat, especially when combined with the surrounding habitat.

Wildlife Resources/Recommendations

As with any development, the impact on wildlife habitat in general will be negative and long lasting. A small area will be broken up and lost with the construction of roads, driveways, walkways, parking areas and homes. Habitat will be lost where cover is cleared for lawns and landscaping. Another impact is the increased human presence, vehicular traffic, and a number of free roaming dogs and cats. This could drive the less tolerant species from the site, even in areas where there has been no physical change. Specifically, species with fairly large home ranges, such as the turkey, may stop frequenting the area due to the disturbance and/or loss of habitat, or may adjust their use of the area, and perhaps use it to a lesser degree.

Certain species which are adaptable to man's activities may increase due to his presence and associated nuisances may occur. Typical species which can become a nuisance include pigeons, starlings and raccoons.

In a small but heavily developed and populated state like Connecticut, where available habitat continues to decline on a daily basis, it is critical to maintain and enhance where possible existing wildlife habitat.

Planning

In planning and constructing a development there are steps that should be considered in order to help minimize adverse impacts on wildlife.

1) Maintain a 100 foot (minimum) wide buffer zone of natural vegetation around all wetland/riparian areas to filter and trap silt and sediments and to provide some habitat for wildlife.

2) Utilize natural landscaping techniques (avoiding lawns and chemical runoff) to lessen acreage of habitat lost and possible wetland contamination.

3) Stone walls, shrubs and trees should be maintained along field borders.

4) Early successional stage vegetation (i.e. field) is a habitat type and should be maintained if possible.

5) During land clearing, care should be taken to maintain certain forest wildlife requirements:

   a) Encourage mast producing trees (i.e oak, hickory, beech). A minimum of five oaks per acre, 14 inches diameter breast height (dbh) or greater should remain.

   b) Leave 5 to 7 snag/den trees per acre as they are used by birds and mammals for nesting, roosting and feeding.

   c) Exceptionally tall trees, used by raptors as perching and nesting sites, should be encouraged.

   d) Trees with vines (i.e. fruit producers) should be encouraged. Shrubs and trees which produce fruit should be encouraged (or can be planted as part of the landscaping in conjunction with the development), especially those that produce fruit which persists through the winter (winterberry, grape). See Appendix B for a list of suggested shrub and tree species that can be encouraged and/or planted to benefit wildlife.

   e) Brush debris from tree clearing should be piled to provide cover for small mammals, birds, amphibians and reptiles.

6) Nesting sites can be provided for a great variety of birds with placement of artificial nest boxes.

7) Large houselots and implementation of the suggested guidelines may help to minimize the adverse impacts to local wildlife populations. Implementation of backyard wildlife habitat management practices should be encouraged. Such activities include providing food, water, cover and nesting areas.

FISHERIES RESOURCES

The fisheries resources of Cherry Brook were investigated as part of the Statewide Stream Survey sponsored by the Fisheries Bureau of the Connecticut DEP.

The sample sites were:

1) Route 179 bridge crossing approximately 3/4 mile north of the Case Street intersection, North Canton. The site was sampled 6/22/88. The sample site was 100 meters in length.

The fish species captured included: brook trout, brown trout, slimy sculpin, blacknose dace, fallfish, creek chub, common shiner, white sucker and American eel. The trout were evident as young-of-the-year, yearling and adult.

2) Along Sweeton Road, opposite the Cherry Brook School, Canton. The site was sampled 7/13/88. The sample site was 100 meters in length.

The fish species captured included: Atlantic salmon, brook trout, brown trout, blacknose dace, common shiner, fallfish, grass pickerel, tessellated darter, bluegill sunfish, common sunfish, white sucker and American eel. The Atlantic salmon were evident as fry and parr, while the trout were as yearling and adult.

Cherry Brook is stocked with Atlantic salmon fry as part of the federal/state funded Atlantic Salmon Restoration Project. A total of 26,514 salmon fry are annually liberated. The stream is open to the public for fishing and receives a yearly stocking of 940 adult brown trout by the DEP.

Cherry Brook is a unique coldwater stream in that it supports not only Atlantic salmon and slimy sculpin, both species considered rare to Connecticut, but also naturally reproducing populations of brook and brown trout. Extreme care is needed in development within this watershed to protect this resource.

Recommendations

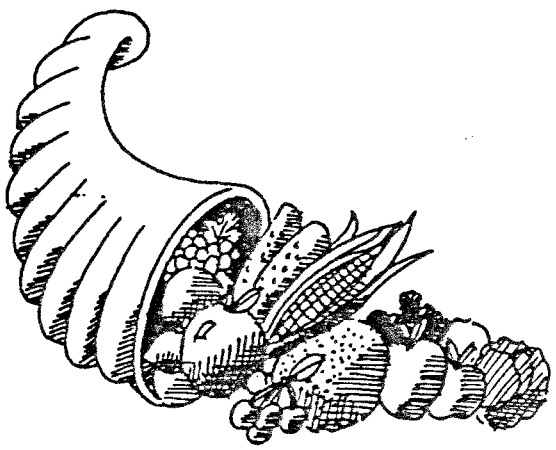
A comprehensive erosion and sediment control plan should be submitted and installed prior to the start of construction and maintained through all construction phases. Mitigative measures should include, but not be limited to, detention basins, silt fences and haybales. Surface runoff during and following construction must not be allowed to enter the stream directly either as surface flow or by directing drainage systems into the stream. Once construction is initiated, Town Officials should police the development to insure that all controls are properly placed and are maintained regularly.

Liming, fertilizing and introducing chemicals to lawns should be limited close to the stream. The importance of properly maintained septic systems should be impressed upon homeowners.

THREATENED AND ENDANGERED PLANT AND ANIMAL SPECIES

According to the DEP - Natural Diversity Database, there are no Federally listed Endangered Species or Connecticut "Species of Special Concern" that occur within the study area. The Natural Diversity Data Base contains the most current biologic data concerning endangered or threatened plant or animal species. On-going research continues to locate additional populations of species or locations of habitats of concern as well as updating existing data.

APPENDICIES



Appendix A: Soil Conditions

TABLE 1: Soil Symbols and Mapping Unit Names

Soil Symbol	Soil Mapping Unit Name
CrD	Charlton very stony fine sandy loam, 15-35% slopes
Lg	Leicester, Ridgebury, and Whitman very stony fine sandy loam
PbC	Paxton fine sandy loam, 8-15% slopes

TABLE 2: Soil Characteristics Important to Development

Soil Symbol	Permeability (in/hr)	K	Corrosivity to Steel	Corrosivity to Conc.	Flooding	Water Table Depth (ft.)	Water Table Kind	High Water Months	Depth to Rock (in.)	Frost Action
CrD	0.6-6.0	0.2	low	high	none	>6.0	---	---	>60	low
Lg	0.6-6.0	0.2	low	high	none	0-1.5	apparent	Nov-May	>60	high
PbC	0.6-2.0	0.24	low	mod	none	1.5-2.5	perched	Feb-Apr	>60	mod

K-Erodibility Factor
.10 -.24 - Low Erodibility
.28 - .37 - Medium Erodibility
.43 - .64 - High Erodibility

Flooding Classes
None
Occasional
Common
Frequent

---no data available

TABLE 3: Major Soil Limitations for Development

Soil Symbol	Septic Systems	Excavations	Dwellings	Basements	Commercial	Roads	Lawns	Fill	Ponds
CrD	C-9	C-9	C-9	C-9	C-9	C-9	C-9	C-9	C-11
Lg	C-2	C-2	C-2	C-2	C-2	C-2,8	C-2	C-2	B-18
PbC	C-6	B-13,2,9	B-2,9	B-2,9	C-9	B-2,9,8	B-9	A	C-11

Degree of Limitation:
A - Soil properties and site features are generally favorable for indicated use and limitations are easily overcome.
B - Soil properties are not favorable for indicated use and special planning, design or maintenance is needed.
C - Soil properties or site features are so unfavorable to overcome that special design, increases in costs,and possible increased maintenance are required.

Types of Limitations:

1 Seepage	2 Wetness	3 Poor Filtration	4 Ponding	5 Banks Cave
6 Slow Perc	7 Flooding	8 Frost Action	9 Slope	10 Low Strength
11 No Water	12 Subsides	13 Dense Layer	14 Humus	15 Shallow Depth
16.Lrg.Stone	17 Sm.Stones	18 Slow Refill	19 Piping	20 Dam Seepage
21 Erosion	22 Droughty	23 Area Reclaim		

Appendix B: Suitable planting materials for wildlife food and cover.

APPENDIX B

Suitable planting materials for wildlife food and cover.

Herbaceous/Vines	Shrubs	Small Trees
Panicgrass	Sumac	
Timothy	Dogwood	
Trumpet creeper	Elderberry	Hawthorn
Grape	Winterberry	Cherry
Birdsfoot trefoil	Autumn olive	Serviceberry
Virginia creeper	Blackberry	Cedar
Switchgrass	Raspberry	Crabappie
Lespedeza	Honeysuckle	
Bittersweet	Cranberrybush	
Boston ivy		

NOTES

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, 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 and/or developers 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 and/or developers in the review of sites proposed for major land use activities. 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 recreational/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 Soil and Water 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 land owner/ developer allowing the Team to enter the property for purposes of review and a statement identifying the specific areas of concern the Team should investigate. When this request is approved by the local Soil and Water Conservation District and King's Mark RC&D Executive Committee, the Team will undertake the review. At present, the ERT can undertake approximately two (2) reviews per month.

For additional information regarding the Environmental Review Team, please contact your local Soil and Water Conservation District or Nancy Ferlow, ERT Coordinator, King's Mark Environmental Review Team, King's Mark RC&D Area, 322 North Main Street, Wallingford, Connecticut 06492. King's Mark ERT phone number is 265-6695.