

KING'S MARK ENVIRONMENTAL REVIEW TEAM



REPORT FOR
THE TERRACES

WATERBURY,
CONNECTICUT

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

THE TERRACES

WATERBURY, 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

Waterbury Inland Wetlands & Watercourses 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 & Watercourses Commission and the City. 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.

OCTOBER 1991

ACKNOWLEDGMENTS

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

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Finally, special thanks to Ralph Belvedere of Waterbury Inland Wetlands and Moses Taylor of USDA-SCS for their assistance during this environmental review.

EXECUTIVE SUMMARY

Introduction

An environmental review was requested by the Waterbury Inland Wetlands and Watercourses Commission for the Terraces Development. The proposed development site is located in Waterbury near the border of the Town of Middlebury. Access is provided by Country Club Road and Southwest Road. The property abuts Hop Brook Dam and Hop Brook Lake which are under the jurisdiction of the Army Corp of Engineers.

The 23-acre site is comprised of many stands of deciduous trees, 2.12 acres of wetlands and a pond. The land is primarily sloping hillside, generally sloping from east to west with grades approaching 20 percent in some areas. The total single family development will contain 55 homes on average lot sizes of .24 acres. The site will be serviced by public water and gravity sewers.

The purpose of this review is to inventory and assess existing natural resources and discuss development opportunities, erosion and sediment (E&S) controls and the maintenance and regulatory activities necessary to assist the City in guiding conservation and development in this area. Specific objectives include:

The review process consisted of 4 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.

Topography

The proposed development site lies on the eastern side of the Hop Brook Lake Valley. Slopes on the hillside are uniform and steep to the west at approximately 20 - 30 percent slope. Gentler slopes are found on the valley floor.

Surficial Geology

The steep slopes are blanketed by a thin veneer of glacial till. Bedrock is probably within a few tens of feet of the hillside surface. The valley floor is underlain by stratified sands and gravel. Foundation excavations which encounter ledge will require blasting as the exposed bedrock is unweathered and relatively unfractured.

Bedrock Geology

The site is underlain by dark gray, well foliated, fine to medium grained plagioclase-biotite gneiss referred to as the Waterbury gneiss or the "Waterbury Formation".

Soil Resources

The major soil limitations are wetlands, seasonal high water tables and steep slopes. These limitations do not preclude development, but indicate the need for precise planning. The soils on the site consist of glacial till derived soils, including Paxton, Woodbridge, Ridgebury, Leicester and Whitman.

Erosion and Sediment Control

The E&S controls are basically adequate but need more detail. Suggestions include specifying phased construction, incorporating the complete E&S controls on the plans, identifying stockpile areas, including seeding recommendations, proper placement of control barriers and detailed access to the detention pond and the oil/grease separator.

Wildlife Considerations

Wildlife habitat at the site consists of second growth forest, wetlands and some shrub, red cedar and herbaceous growth. A variety of wildlife is expected to use this area, including deer, raccoon, fox, opossum, gray squirrel, garter snake, red spotted newt, downy and hairy woodpecker, catbird, tufted titmouse and nuthatch.

Wetlands are very important to wildlife. A buffer of undisturbed vegetation around wetlands is recommended for wildlife and protection of the wetlands from siltation. Streams are used as travel corridors by many wildlife species. A 100-foot buffer around streams is recommended for protection. The forests also provide valuable habitat and open space areas should contain a variety of habitats.

As with any development, the impact on wildlife will be negative and long-lasting. The area will be broken-up and lost to roads, driveways, lawns and houses. Increased numbers of humans, dogs, cats and cars will also affect wildlife. Certain species which adapt well can become a nuisance. Alternative designs which can protect wildlife habitat include large lots and cluster development. Setting aside a combination of habitats for open space is desirable. Open space areas should be connected to provide travel paths. Certain steps can be taken to minimize the effects of development on wildlife. These include buffer strips, natural landscaping techniques, maintaining field borders and early successional stage vegetation and maintaining wildlife requirements.

The wildlife habitat value of the site is limited because there is little diversity of habitat, the site is very small in size and is surrounded on 3 sides by development. The site's greatest value for wildlife is as additional habitat and a buffer zone to the large area of wildlife habitat offered by the Hop Brook Flood Control Area.

Fisheries Resources

The site contains a warmwater pond and several intermittent drainage streams. The fisheries resources in the pond are expected to be limited in both species diversity and density. Species in the pond may include largemouth bass,

sunfish, golden shiner and brown bullhead. Hop Brook Lake must be protected from surface waters flowing down gradient from the development site. Recommendations include implementing a stormwater detention management plan, maintaining a 100 foot buffer zone along Wooster Brook, establishing a comprehensive E&S control plan and limit liming, fertilizing and the introduction of chemicals to lawns.

Threatened and Endangered Plant and Animal Species

According to the Natural Diversity Data Base, there are no Threatened or Endangered Species or Connecticut "Species of Special Concern" at the site.

Archaeological Considerations

A review of the State files shows 3 prehistoric Indian encampments immediately south of the project site. While no archaeological sites are listed within the site, the probability of locating similar prehistoric Indian sites along the terraces is extremely high. The stone walls on the site are not eligible for the National Register of Historic Places, however they are important markers of the early history of the City and should be protected. An archaeology survey is recommended.

Planning Considerations

Land use in the area includes single family homes and the Army Corp Property. The proposed development currently meets the City's zoning regulations for the Single Family Residential Zone (RS), requiring 7500 square foot minimum lot sizes. However, consideration should be given to the number of lots. Eliminating lots 1, 2, 3, 10, 11, 12, 13, 33, 34 and 35 will lessen the impact on wetland areas and the pond.

The proposed cul-de-sac streets meet all standards, but connecting Nutmeg Lane and Squire Lane into a loop would provide safer and easier access to the lots within the subdivision. This would also maintain lower speeds and discourage thru-traffic.

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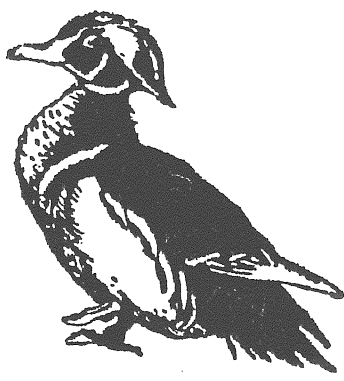
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INTRODUCTION



INTRODUCTION

An environmental review was requested by the Waterbury Inland Wetlands and Watercourses Commission for the Terraces Development. The proposed development site is located in Waterbury near the border of the Town of Middlebury. Access is provided by Country Club Road and Southwest Road. The property abuts Hop Brook Dam and Hop Brook Lake which are under the jurisdiction of the United States Army Corp of Engineers.

The 23-acre site is comprised of many stands of deciduous trees, 2.12 acres of wetlands and a pond. The land is primarily sloping hillside, generally sloping from east to west with grades approaching 20 percent in some areas. The total single family development will contain 55 homes on average lot sizes of .24 acres. The site will be serviced by public water and gravity sewers.

The purpose of this review is to inventory and assess existing natural resources and discuss development opportunities, erosion and sediment (E&S) controls and the maintenance and regulatory activities necessary to assist the City in guiding conservation and development in this area. Specific objectives include:

- 1) Assessing the hydrological and geological characteristics of the site, including geological development limitations and opportunities;
- 2) Determining the suitability of existing soils to support planned development;
- 3) Discussing soil erosion and sedimentation concerns;
- 4) Assessing the impact of development on the wetlands and watercourses;
- 5) Assessing the impact of development on wildlife;
- 6) Assessing the impact of development on fisheries; and
- 7) Assessing planning and land use issues.

THE ENVIRONMENTAL REVIEW TEAM PROCESS

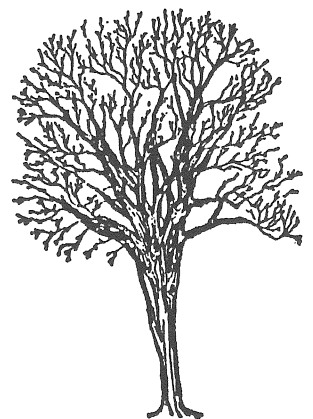
Through the efforts of the Waterbury Inland Wetlands and Watercourses Commission and the King's Mark Environmental Review Team (ERT), this environmental review and report was prepared for the City. This report primarily provides a description of on-site natural resources and presents planning and land use guidelines. The review process consisted of 4 phases:

- 1) Inventory of the site's natural resources (collection of data);
- 2) Assessment of these resources (analysis of data);
- 3) Identification of resource problem areas; and
- 4) Presentation of planning and land use guidelines.

The data collection phase involved both literature and field research. The ERT field review took place on September 11, 1991. Field review and inspection of the site proved to be a most valuable component of this phase. The emphasis of the field review was on the exchange of ideas, concerns or alternatives. Mapped data or technical reports were also perused, and specific information concerning the site was collected. Being on-site also allowed Team members to check and confirm mapped information and identify other resources.

Once Team members had assimilated an adequate data base, they were able to analyze and interpret their findings. Results of this analysis enabled Team members to arrive at an informed assessment of the site's natural resource opportunities and limitations. Individual Team members then prepared and submitted their reports to the ERT Coordinator for compilation into the final ERT report.

PHYSICAL CHARACTERISTICS



TOPOGRAPHY

The Terraces Development site lies on the eastern side of the Hop Brook Lake Valley (See Figure 3). Slopes on the hillside are uniform and steep to the west, ranging from 20% to 30% slope. Much gentler slopes are found on the valley floor. The base of the steep hillside is marked by a prominent break in slope at approximately the 350 foot elevation contour.

SURFICIAL GEOLOGY

The steep slopes are blanketed by a thin veneer of glacial till, a compact but a poorly sorted material transported and deposited by glacial ice. Bedrock is probably within a few tens of feet of the hillside surface as outcrops are found on Country Club Road and along the southern-most edge of the site. Foundation excavations which encounter ledge will require blasting as the exposed bedrock is unweathered and relatively unfractured. The gentle slopes on the valley floor are underlain by stratified sands and gravel deposited by glacial meltwaters. The thickness of these deposits are more difficult to estimate but are likely to be much thicker than the glacial till mantle on the hillside.

BEDROCK GEOLOGY

The area is underlain by dark gray, well-foliated, fine-to-medium grained plagioclase-biotite gneiss referred to as the Waterbury gneiss on the Geologic Map of Connecticut (Rodgers, 1985) and as the "Waterbury Formation" in the Bedrock Geology of the Waterbury Quadrangle (Gates and Martin, QR-22, 1967). Gates and Martin describe the rock as hard, tough and coherent, breaking as easily across their

layering as along it. Sulfides are not common, and the weathering of the freshly blasted rock used as fill in construction is not likely to acidify or otherwise affect the quality of the ground water runoff.

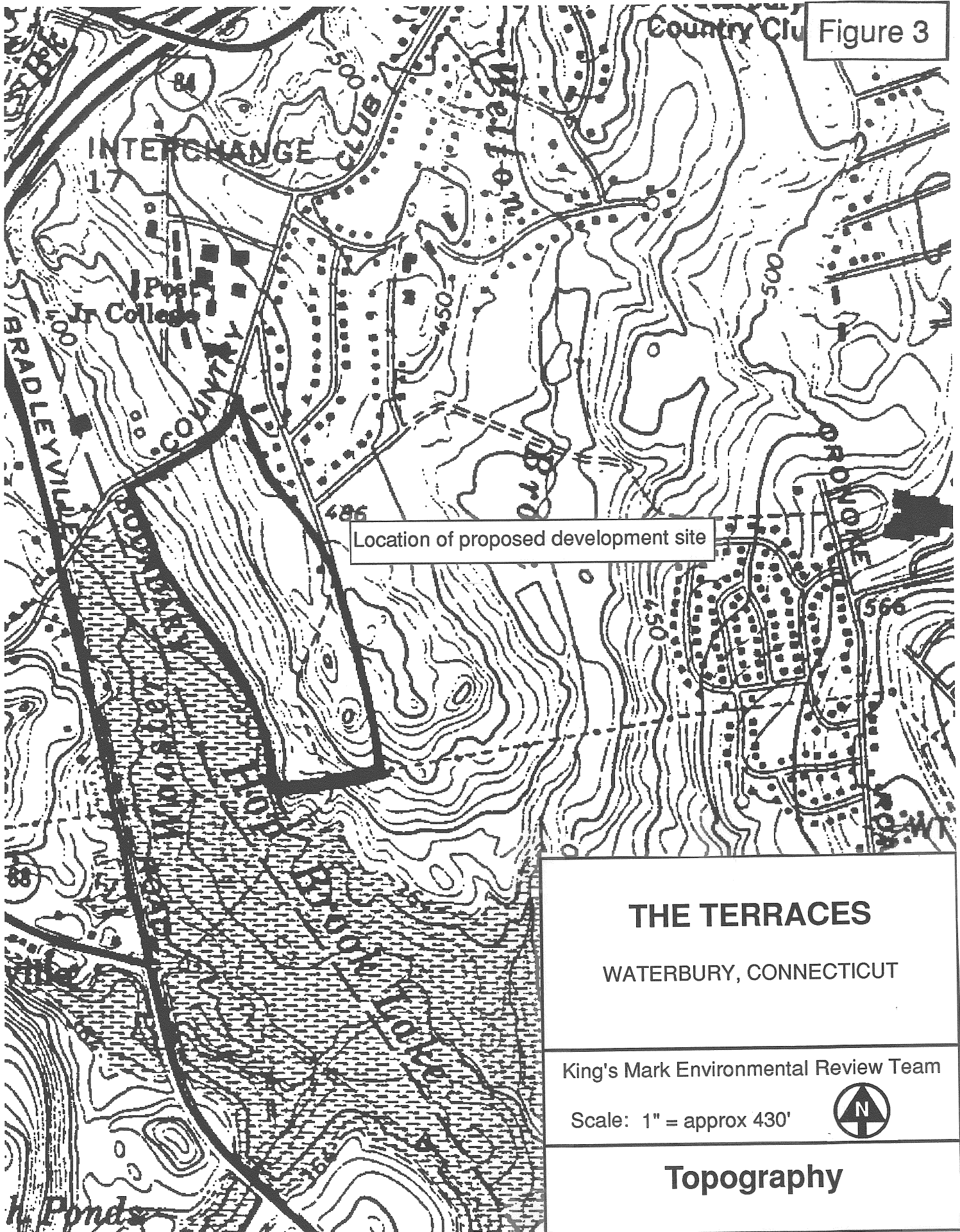
The steep slopes and shallowness of the bedrock on the proposed development site present serious problems for the siting and excavation of roads, storm sewers and foundations. Blasting will undoubtedly be required and the development will significantly and permanently alter the topography of the hillside and change the water and sediment runoff into Hop Brook Lake. All phases of the design and construction process should be carefully monitored to minimize the impact of these changes.

SOIL RESOURCES

The soils report produced by Northeast Soils, Inc. for the proposed development site is consistent with the National Cooperative Soil Survey for New Haven County. On-site flagging of the inland wetland soils has been completed and soil information was provided for Section One of the proposal. Soils on site consist of glacial till derived soils, including well-drained **Paxton**, moderately well drained **Woodbridge**, and the poorly or very poorly drained undifferentiated group of **Ridgebury**, **Leicester** and **Whitman** soils (See Figure 4). The soils are briefly described below and in Appendix A.

The **Paxton** (Pb) soils have fair potential for community development. They are limited mainly by the seasonally perched water table and the high erodibility of the steeper slopes. Fairly intensive conservation measures are needed to prevent excessive runoff, erosion and siltation during periods of construction on these steeper slopes.

Figure 3



THE TERRACES

WATERBURY, CONNECTICUT

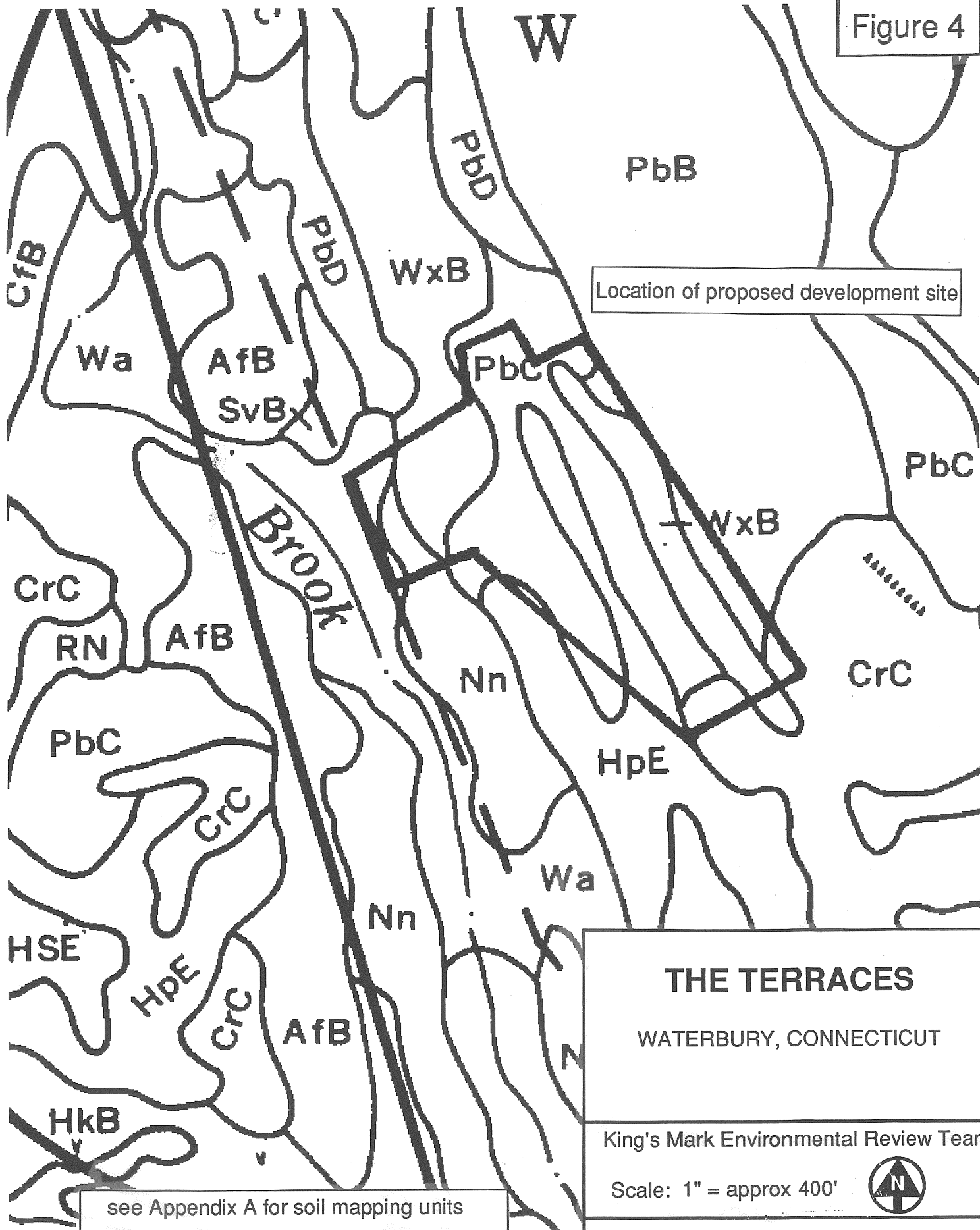
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Scale: 1" = approx 430'



Topography

Figure 4



Location of proposed development site

THE TERRACES
WATERBURY, CONNECTICUT

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Scale: 1" = approx 400'



see Appendix A for soil mapping units

Soils

The **Woodbridge** (Wx, Wy) soils have fair potential for community development. They are limited mainly by the seasonal high water table and by the slowly permeable substratum. Because of the seasonal high water table, excavations are inundated. Steep slopes of excavations are unstable when the soil is saturated and tends to slump. During construction, conservation measures are needed to prevent excessive runoff, erosion and siltation.

The **Ridgebury, Leicester and Whitman** (Rn) soils have poor potential for community development due to the seasonal high water table. These wetland soils are rated severe for local roads and streets due to wetness and frost action.

It should be noted that both the report from Northeast Soils, Inc. and the submitted plan maps denote a Ud - w, that is, an **Udorthent** soil with an aquatic moisture regime, as a wetland soil. This soil classification does not show up on the map's landscape as part of the site's soils. It is unclear where these soils are located on the property if, in fact, they actually do exist on the landscape. This should be clarified. Properties of these soils are specific to the site and need individual investigation.

EROSION AND SEDIMENT CONTROL

In 1983, Public Act No. 83-388, "An Act Concerning Soil Erosion and Sediment Control", was passed to "reduce the danger from storm water runoff, minimize non-point source sediment pollution from land being developed and conserve and protect the land, water, air and other environmental resources of the state." Under this law, most applications for development must have a comprehensive erosion and sediment (E&S) control plan, including a map and narrative. Although the proposed development for Section One has an E&S control plan, it can be more detailed.

Additionally, these comments should be considered:

- 1) Due to the erodibility of the soils, specifying phased construction would provide greater E&S control and minimize disturbed areas. This should be included on the maps and specified in the narrative along with the estimated start and completion dates for the sequence for grading, construction and E&S control activities for the road construction, utility installation, house construction and detention pond installation.
- 2) Stockpile areas for topsoil and cleared material should be identified on the plan.
- 3) Seeding recommendations, along with optimum seeding times, and lime, fertilizer and mulch recommendations should be included in the narrative.
- 4) The method for the protection of disturbed areas when the time of year or weather prohibits the establishment of permanent vegetative cover should be included in the narrative.
- 5) Greater attention should be given to the placement of E&S control barriers. All toes of constructed slopes should show installed barriers on the plan. No barriers should be installed up and down the slope as shown on sections of the plan.
- 6) The typical E&S control measure for house construction as shown for lot 29 is not representative of conditions for all house lots; especially those lots that are to be significantly altered such as lots 3 and 33. Individual house lot E&S controls should be submitted.
- 7) Access to the detention pond should be detailed on the plan as well as E&S control measures for the access. Final disposition of soil materials should be detailed in the plan and in the narrative. Provisions for operation and maintenance of the detention pond should be provided for.
- 8) Provisions for access to, and operation and maintenance of the oil/grease separator should be provided for.

BIOLOGICAL RESOURCES



WILDLIFE CONSIDERATIONS

Description of Area/Habitat

The 23-acre site is primarily covered by second growth forest. There are approximately 2 acres of wetlands and shrubs, red cedar and herbaceous growth dominate in a few areas where very small openings remain in the forested area.

Wildlife habitat is the complex of vegetation and physical characteristics that provide for all the requirements of wildlife, including food, shelter, resting, nesting and escape cover, water and space. Generally the greater the habitat diversity and degree of interspersion of various habitat types, the greater the variety of wildlife there is using an area. In other instances, large unbroken expanses of forestland provide important habitat for many species of birds and other wildlife. There are many other factors to consider when determining habitat use or quality including size, habitat type, quality and diversity and juxtaposition with other neighboring habitat.

The wildlife habitat value of the proposed development site is limited because there is little diversity of habitat, the site is small in size and is surrounded on 3 sides by development. The site's greatest value for wildlife is as additional habitat and a buffer zone to the large area of wildlife habitat offered by the Hop Brook Flood Control Area. The Hop Brook Flood Control Area contains good to excellent wildlife habitat due in part to the presence of the brook and associated wetland habitat found there.

Although the development site has limited wildlife habitat value, it does provide habitat for a variety of wildlife. A variety of wildlife species could utilize the site to serve all their needs, while many other species find it a place to meet some requirements. These species include raccoon, opossum, gray squirrel, deer, fox, garter snakes, red spotted newt, downy and hairy woodpecker, catbird, tufted titmouse and nuthatch.

Forestland: The majority of the site is covered with hardwood forest. Forests provide many things to wildlife, including cover, food, nesting places, denning sites and roosting places. Trees also provide a variety of food in the form of nuts, berries, catkins, buds and browse. The snag trees (i.e., dead trees) are a source of insects which serve as food for many species, including woodpeckers and chickadees. Den trees (i.e., trees with cavities) can serve as a nesting or denning place for animals such as squirrels and raccoons.

Herbaceous/Shrub Openings: There are several very small areas dominated by shrubs and herbaceous growth where openings still remain in the forest. These small areas are dominated by multi-flora rose, red cedar, red maple and a variety of grasses and weeds. These areas provide some habitat diversity and provide dense cover to many species of birds and small mammals.

Wetlands: Because wetlands increase the habitat diversity of a site and offer a variety of food and cover to wildlife, they are important areas to consider for protection. Acre for acre, some wetlands and their associated riparian zones exceed all other land types in wildlife productivity. In addition to their value as wildlife habitat, wetlands serve other valuable functions, including water recharge, sediment filtering and flood storage. For these reasons, the development of, filling in and/or crossing of wetlands should be avoided or limited whenever possible.

The majority of the wetlands are located in the northwest corner of the site. They are dominated by a red maple overstory and a very open understory. Barberry left over from when the area was pasture is plentiful as ground cover. Little else grows in the understory except scattered spice bush. There are many areas of exposed wetland soils that support no growth. Although all wetlands have some value, the wetlands on the site have limited value as wildlife habitat because of their small size and lack of vegetation diversity. The main value of the wetlands is that they provide a buffer of undisturbed vegetation and additional habitat along Hop

Brook. The small pond found in the southeastern section of the site offers some habitat for wildlife but is limited due to its small size.

Wildlife Habitat/Recommendations

As with any development of an undisturbed area, the impact on the wildlife habitat will be negative. The impact at this site will probably be fairly extensive because of the density of the development, addition of roads and the proximity to wetlands. Large portions of the site will be broken-up and lost in the construction of homes, roads, parking lots and walkways. Habitat will be lost where cover is cleared for lawns and landscaping. Another impact is the increased human presence, vehicular traffic and the number of free roaming children, dogs and cats. This could drive the less tolerant species from the immediate area of development and from areas where there has been no physical change. The value of the site for wildlife habitat correspondingly decreases as the amount of development increases. 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. Species sensitive to man's presence or the changes made at the site will either move away or perish.

The design of developments can have a dramatic effect on the habitat quantity and quality remaining after construction. Ideally, a design which leaves maximum open space (i.e., clustering homes) for use as wildlife habitat is best. Clustering homes on suitable land well away from wetlands usually leaves the most habitat undisturbed. Breaking up a site into many small lots such as is proposed here is usually least desirable as it results in the greatest habitat loss and disturbance from human development. The proposed lot sizes are extremely small, averaging only .24 acres in size. Larger lots would result in less habitat loss due to less disturbed area. Clustering homes (as long as density is not great) well away from wetlands and the habitat provided by the Army Corp Property would preserve the greatest wildlife

habitat value by leaving the greatest amount of area left undeveloped.

Ideally, a buffer of undisturbed vegetation should be left around all waterbodies and wetlands. A minimum 100 feet of undisturbed vegetation left along the stream/riparian zone and around the perimeter of wetlands is recommended to preserve the usefulness of the stream or riparian habitat for wildlife.

The proposed site plans include 2 wetland crossings. Wherever possible, wetland crossings should be avoided and/or minimized. It appears that a detention pond and a traprock stilling basin are proposed near or partially in the wetland area in the northwest corner of the site. In general, it is never preferable to excavate detention basins in wetlands because it results in a net loss of wetlands, represents a long-term change/disturbance to the wetlands and can alter wetland vegetation, not so much by the fluctuating water levels caused, but by the addition of pollutants that are contained in runoff. Detention basins also require regular maintenance and cleaning, which means a piece of equipment must get to them. If the detention basin has been excavated in a wetland, the wetland will be disturbed each time equipment is brought in.

All stormwater from the proposed development site will eventually flow into Hop Brook. Maintaining good water quality in wetlands is important for humans as well as wildlife. Silts and oils from runoff can smother invertebrate life forms, thereby effecting the food chain. An observable effect of siltation is the change in vegetation. Road salts and oils can alter water chemistry and the types of wildlife which ultimately utilize a wetland area. All precautions should be taken to insure that all water entering the wetlands during and after development is of good quality. Additionally, proper E&S controls should be maintained throughout construction. Degradation can occur during and after construction.

The Hop Brook Lake Flood Control Area is managed by the Army Corps of Engineers for flood control and recreation. In addition, extensive habitat

management work for wildlife including, maintaining wetland buffers, selective cutting, maintenance of old field habitat, shrub and tree planting etc. have been undertaken to maintain and improve existing wildlife habitat. As proposed, this development would not only greatly impact the 23 acres on which the houses and roads will be built, but would also negatively impact the wildlife habitat provided at the Hop Brook Flood Control Area due to increased human disturbance and potential degradation of the wetlands due to sedimentation, erosion and poor quality runoff.

Additional Considerations

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.

In planning and constructing a development, there are measures that should be considered to minimize adverse impacts on wildlife. Despite these measures, wildlife habitat will increasingly be adversely impacted as the amount of development increases on the site. These measures include:

- 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) Stonewalls, shrubs and trees should be maintained along field borders.
- 4) Early successional stage vegetation (i.e., field) is an important 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 and beech). A minimum of 5 oaks per acre, 14 inches dbh or greater should remain.
 - b) Leave 5 to 7 snag/den trees per acre because 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 or can be planted as part of the landscaping in conjunction with the development, especially those that produce fruit which persists through the winter (i.e., winterberry). Appendix B contains 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.

FISHERIES RESOURCES

Site Description

The proposed Terraces Development site contains a pond and several intermittent drainage streams. The pond is approximately 0.2 acres in surface area and is reportedly artificial in nature. Data concerning maximum depth, average depth and prior fish liberations are not available. Based solely upon visual observation, the pond appears to be relatively shallow with an abundance of aquatic plant growth. Observable physical conditions would classify the pond as being warmwater.

Aquatic Resources

The fisheries resources of the pond are expected to be limited in both species diversity and density. The pond may contain all or a portion of the following species: largemouth bass, sunfish, golden shiner and brown bullhead. These species are common to small warmwater ponds in Connecticut.

The drainage streams on the site do not contain fisheries resources because they do not flow or maintain a water level year round.

Although Hop Brook, Hop Brook Impoundment and Wooster Brook are found outside the property bounds of the proposed development site, concerns have been

expressed these surface waters into which runoff from the development may drain.

Hop Brook, classified as coldwater, has a fishery population comprised of: brook trout, blacknose dace, longnose dace, common shiner, tessellated darter and white sucker. The Connecticut Department of Environmental Protection (DEP) Inland Fisheries, in conjunction with the U.S. Army Corps of Engineers, manages the reach of Hop Brook within the Recreation Area for recreational trout fishing. A portion of the 1,400 adult brook, brown and rainbow trout annually allocated for Hop Brook are liberated within this reach of stream. Although managed for put-and-take fishing, stream habitat conditions allow year-round survival of trout escaping angling mortality.

Hop Brook Impoundment, created by the damming of Hop Brook, has been created to provide for flood control. With the maintenance of a minimal storage pool, habitat is provided for a variety of fish species. DEP Inland Fisheries, in conjunction with the U.S. Army Corps of Engineers, manages Hop Brook Impoundment for recreational trout fishing with approximately 6,000 adult brook, brown and rainbow trout being liberated annually. Trout are managed primarily on a put-and-take basis as water quality conditions are not always present to allow for their year-round survival.

In addition to trout, Hop Brook Impoundment supports a self reproducing population of largemouth bass, bluegill sunfish, pumpkinseed sunfish, black crappie, yellow perch, redbfin pickerel, common shiner, golden shiner, brown bullhead and white sucker. Wooster Brook, having the physical conditions to classify it as being coldwater, contains a limited coldwater fishery population composed of blacknose dace, common shiner and white sucker. The limited diversity of coldwater species is apparently due to instream habitat degradation. Warmwater species, such as bluegill sunfish, pumpkinseed sunfish, yellow perch and golden shiner, are found in relatively limited numbers in the stream.

Impacts

The proposed Terraces development is not anticipated to impact the pond on the site as the pond is at a location up-gradient of the development. There are no fisheries concerns for the intermittent drainages on the tract.

Although outside the bounds of the proposed development, there are concerns for those surface waters within the immediate watershed located down gradient of the proposed development. During construction, the potential for soil erosion and sedimentation of off-site watercourse(s) caused by the overland flow of water over scarified soils, recently excavated/filled areas or stockpiled materials, following storm events may allow sediments to enter surface watercourses. The potential exists for sediment transport given the topography of the site. Sediment deposition can eliminate aquatic habitats and hinder insect and fish reproduction. Excessive quantities of suspended sediments can lead to direct or delayed mortality of various aquatic life forms. Runoff and leaching of nutrients from eroded soils and lawn fertilizers applied to manicured lawns can potentially stimulate excessive aquatic plant growth and degrade water quality.

Recommendations

To eliminate or curtail the sediment/nutrient input to surface waters the following are recommended:

- 1) Implement a phased development scheme with the installation of the stormwater detention basin and associated stormwater management system as the initial phase to contain stormwater, sediments and nutrients on-site.
- 2) Maintain at a minimum a 100 foot open space buffer zone along the development's closest encroachment to Wooster Brook; no construction, including placement of the detention basin or alteration of riparian habitat should take place within this zone.
- 3) Establish a comprehensive E&S control plan with mitigative measures (i.e., hay bales, silt fence, etc.) to be installed prior to and maintained through all development phases.

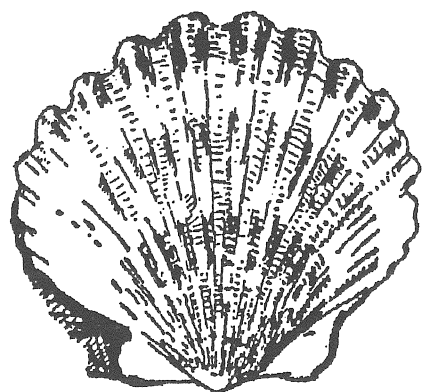
- 4) Limit liming, fertilizing and the introduction of chemicals to manicured lawns.

THREATENED AND ENDANGERED PLANT AND ANIMAL SPECIES

According to Natural Diversity Data Base maps and files, there are no known extant populations of Federally Endangered and Threatened species or species **proposed** for State Endangered, Threatened or Special Concern status (General Statutes Section 26-303 - Section 26-315) within the site boundaries.

Natural Diversity Data Base information includes all information regarding critical biologic resources available at the time of the request. This information is a compilation of data collected over the years by the Natural Resources Center's Geologic 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. Consultation with the Data Base should not be substituted for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as enhance existing data. New information is incorporated into the Data Base as it becomes available.

ARCHAEOLOGICAL RESOURCES



ARCHAEOLOGICAL RESOURCES

The Terraces development site is located along a series of terraces along the east bank of the Hop Brook drainage system and lake area developed by the Army Corp of Engineers. A review of the State of Connecticut Archaeological Site Files and Maps shows 3 prehistoric Indian encampments immediately south of the project site. These sites were located during an archaeological survey of the property to mitigate cultural resources for the proposed damming and creation of Hop Brook Lake. While no archaeological sites are listed within the site, the probability of locating similar prehistoric Indian sites along the terraces is extremely high.

Beginning around four thousand years ago, Native Americans began utilizing the natural resources associated with the brook system. The terraces consisting of well-drained soils and limited slope provided excellent camping areas with close proximity to the wetland resources. The fact that no sites have been recorded in the project site is a reflection of archaeologists not having access to the property, rather than there being no sites to register. The environmental and topographic variables archaeologists search for in predicting prehistoric site locations are encompassed on the series of terraces above the Hop Brook.

In addition to prehistoric Native American cultural resources, the project site is transversed with a series of stone walls and old road beds from early historic times. The stone walls are excellent examples of late-18th and early-19th century farming activities. While the walls are of themselves not eligible for the National Register of Historic Places, they are important markers of the early history of Waterbury. It is recommended that all the stone walls be mapped in detail, including small piles of stone associated with their building. While it is recognized that it may not be feasible to preserve in place all the walls, it is highly recommended that a significant number of walls remain intact. They could easily be

incorporated into the design of the subdivision lots and be preserved for future generations to enjoy and learn of historic heritage.

The Office of State Archaeology strongly recommends an archaeological reconnaissance survey for the entire project area to identify and locate all cultural resources including Native American camps and early historic farming sites. All studies should be conducted in accordance with the Connecticut Historical Commission's ENVIRONMENTAL REVIEW PRIMER FOR CONNECTICUT'S ARCHAEOLOGICAL RESOURCES. The Office of State Archaeology is prepared to offer the developer and the City of Waterbury any technical assistance in accomplishing this survey.

LAND USE AND PLANNING CONSIDERATIONS



PLANNING CONSIDERATIONS

Zoning and Surrounding Land Uses

The proposed development consists of 55 single family residential building lots on approximately 23+ acres located west of Southwest Road and south of Country Club Road on the western side of the City of Waterbury. The proposed subdivision currently meets the City's zoning regulations for the Single Family Residential Zone (RS) which requires 7500 square foot minimum lot sizes. The site is served by City water and sewer.

The site is located on a hillside with approximately 2+ acres of wetlands. Surrounding land-use includes single family homes to the east and north along Southwest and Country Club Roads. Army Corps of Engineers property abuts the site to south and west. The site generally drains into Wooster Brook and Hop Brook Lake.

While the proposed subdivision meets the City's zoning regulations, consideration should be given to eliminating a number of lots, particularly in the poorly drained wetlands areas of the development.

Traffic Considerations

The proposed subdivision shows site access from Country Club Road and Southwest Road. Site circulation is provided primarily by 2 cul-de-sacs: Nutmeg Lane and Squire Lane. Squire Lane is approximately 960 feet long with 21 residential lots having access to this cul-de-sac. This development intensity meets the Rutgers University standard for maximum length of a cul-de-sac street (i.e., average 100 foot lot frontage per residential lot) however, the City's maximum cul-de-sac length is 750 feet (Sec. 5.6, City of Waterbury Subdivisions Regulations, July 1, 1985). Regardless of the cul-de-sac standard employed, it appears that by connecting Nutmeg Lane and Squire Lane into a "loop" street, would provide safer and easier access to the lots

within the subdivision.

In order to achieve a reduced impact on the site's wetland areas and to improve vehicle circulation and access, the following modifications, at the minimum, should be considered:

- 1) Eliminate lots 1, 2, 3, 33, 34 and 35, and realign the Squire Lane access of Country Club Road to the east as much as possible. The reduced development and road realignment will lessen the impact on wetlands areas in the northern portion of the site and will provide a natural buffer to the existing homes in the area. This change will also provide a more aesthetical pleasing entrance into the development.
- 2) Eliminate lots 10, 11, 12 and 13 in the vicinity of the existing pond and wetland. Preserve this area as permanent open space.
- 3) Connect Nutmeg Lane and Squire Lane, providing a "loop" street circulation within the site. This change may require the elimination of lot 20 and the re-sizing of the abutting parcels. Such site circulation will provide safer and easier vehicle access while maintaining lower speeds and discouraging thru-traffic.

It was indicated in several other reviewed reports that all wetlands and watercourses areas were not indicated on the plans provided. Additionally, only the first phase of the development shows building footprints. This lack of detailed information precludes a more in depth review. These details should be shown on any revisions to the plans.

APPENDICIES



Appendix A: Soil Limitations Chart

MAJOR LIMITATIONS TO THE DEVELOPMENT OF:

MAP UNIT NAME	GENERAL SOIL PROPERTIES	DRAINAGE CLASS AND DEPTH TO SEASONAL HIGH WATER TABLE	HOMES WITH BASEMENTS	ROADS AND STREETS
Paxton	Deep loamy soils formed in compact glacial till on uplands	Well-drained perched 1.5-2.5 feet	Wetness	Wetness, frost action
PdC - Paxton very stony fine sandy loam, 8-15% slopes	Deep loamy soils formed in compact glacial till on uplands	Well-drained perched 1.5-2.5 feet	Wetness	Wetness, frost action
PeC - Paxton extremely stony fine sandy loam, 8-15% slopes	Deep loamy soils formed in compact glacial till on uplands	Well-drained perched 1.5-2.5 feet	Wetness	Wetness, frost action
PeD - Paxton extremely stony fine sandy loam, 15-35% slopes	Deep loamy soils formed in compact glacial till on uplands	Well-drained perched 1.5-2.5 feet	Wetness	Wetness, frost action
*RN - Ridgebury, Leicester and Whitman	Soils formed in glacial till	Very poorly and poorly drained Ridgebury 0-1.5 feet Leicester 0-1.5 feet Whitman +1-0.5 feet	High water table, ponding	Ponding, frost action
*Rb - Raypol silt loam	Very deep soils formed in loamy over sandy and gravelly glacial outwash	Poorly drained 0-1.0 feet	Wetness	Wetness, frost action

MAJOR LIMITATIONS TO THE DEVELOPMENT OF:

MAP UNIT NAME	GENERAL SOIL PROPERTIES	DRAINAGE CLASS AND DEPTH TO SEASONAL HIGH WATER TABLE	HOMES WITH BASEMENTS	ROADS AND STREETS
*Sc - Saco silt loam	Very deep soils formed in alluvial deposits	Very poorly drained 0-0.5 feet	Flooding, wetness	Flooding, wetness, frost action
Woodbridge	Deep loamy soils formed in compact glacial till on uplands	Moderately well-drained perched 1.5-2.5 feet	Wetness	Frost action
UD - Udorthents	Cut or borrow areas, filled areas and areas consisting of both cut and fill	Well-drained to excessively drained	Not rated	Not rated

* Inland wetland soil

Appendix B: Suitable Planting Materials for Wildlife Food and Cover

SUITABLE PLANTING MATERIALS FOR WILDLIFE FOOD AND COVER

Herbaceous/Vines

Panicgrass
Timothy
Trumpet creeper
Grape
Birdsfoot trefoil
Virginia creeper
Switchgrass
Lespedeza
Bittersweet
Boston ivy

Shrubs

Sumac
Dogwood
Elderberry
Winterberry
Autumn olive
Blackberry
Raspberry
Honeysuckle
Cranberrybush

Small Trees

Hawthorn
Cherry
Serviceberry
Cedar
Crabapple

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 Sue Ferrarotti, 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.