

KING'S MARK ENVIRONMENTAL REVIEW TEAM



REPORT FOR

NORTH MILFORD VILLAGE

MILFORD,
CONNECTICUT

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

NORTH MILFORD VILLAGE

MILFORD, 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

Milford Inland Wetlands 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 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 1989

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
566-3540
- * David Chiappetta, Soil Conservationist
USDA - Soil Conservation Service
269-7509
- * Carla Harvey, Wetland Specialist
Department of Environmental Protection - Water Resources Unit
566-7280
- * Jerry Milne, Forester
Department of Environmental Protection - Forestry Unit
393-0723
- * Judy Wilson, Wildlife Biologist
Department of Environmental Protection - Western District
485-0226
- * Nicholas Bellantoni, Archaeologist
Office of State Archaeologist
486-5248
- * Linda Reed, Planner
South Central Council of Governments
234-7555

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 Mary Anne Davis, Wetlands Compliance Officer, Bart Block, John Rigely Jr., Judy Weyant, Kathleen Holdsworth and Dierdra Green of the Milford Inland Wetlands Commission, Michael McGoldrick and John Hollywood, Sasaki Associates, Inc, Peter LeTourneau and Andrew Lord, Haley and Aldrich, and Robert Berchem and Stephen Struder, Berchem and Moses, lawyers for the developer, for their cooperation and assistance during this environmental review.

EXECUTIVE SUMMARY

Introduction

The Milford Inland Wetland Commission has requested that an environmental review be conducted on North Milford Village, a 156-acre site proposed for subdivision and condominium development. The site is located in northwest Milford near the Merritt Parkway and the Milford Connector. The developer proposes approximately 250 single-family homes and 64 multi-unit condominiums for a total of 419 dwelling units. Also proposed are tennis courts, a pool and a clubhouse. Approximately 2.5 miles of new road are proposed to serve the site. The site will be served by municipal sewer and water.

The site is an old farm with wooded areas and overgrown fields. The Milford Bowhunters use the western portions for a practice area. The southwest portions of the site contain some steep slopes. Several areas of wetlands are found scattered throughout the site. A CL&P right-of-way crosses the site near East Rutland Road. An area of the site is known locally as "Pox Hill." It is considered a burial site for small pox victims from the Colonial/revolutionary era.

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. The major findings of the ERT are presented below:

Location and Land Use

The surrounding land use includes single-family residences, agricultural land, private, wooded land and industrial properties. Sikorsky Heliport is northeast of the site and the CL&P right-of-way bisects the site. A review of air photos indicates that over the years there has been a decrease in agricultural uses and an increase in single-family residences. Currently the site is zoned R-30 (single-family residences on 30,000 square feet) and LI-30 (light industrial uses on 30,000 square feet). The LI-30 area is proposed for a zone change to R-30 and HDD. The site will be served by water from the South Central Regional Water Authority and sewer by the Milford municipal system.

Topography

The site contains a portion of a drumlin. The remainder of the site slopes gently. Site elevations range from 50 to 180 feet above mean sea level.

Geology

The bedrock types underlying the site have been mapped as a Maltby Lakes Volcanics and Wepawaug Schist. Depths to the bedrock range from zero in outcrop areas to 10 feet in the deeper areas. Glacial till and stratified drift overlays the

bedrock on the site. The stratified drift deposits contain 2 excavation areas for sand and gravel. Regulated inland wetland soils have been flagged by a soil scientist.

Geologic Development Concerns

Water and sewer lines will be extended to serve the project. This should ameliorate many of the hydrogeologic concerns. Geologic limitations to development include shallow bedrock which may require blasting, moderate to steep slopes which may require cuts and fill, regulated wetland soils and till soils which contain clay and silt. Blasting may be required to place utilities, roads and foundations. Any blasting should be done under the supervision of people familiar with the latest blasting techniques. Concerns include seismic shock and air blast which may damage wells in the area. Certain blasting techniques can be used to minimize damage. A pre-blast survey and a geotechnical survey are recommended. If the blasted rock is used for construction purposes, tests should be conducted to make sure there is no potential for acid mine drainage. The Maltby Lakes Volcanics contain pyrite which can lower water quality. Steep slopes have the potential for erosion and sediment problems. Any land disturbance in areas of steep slopes should be protected. Erosion and sediment controls should be carefully monitored. Buildings near steep slopes and rock cuts should have a geotechnical survey to prevent slope failure and rock slides.

Regulated wetlands will be affected by road crossings, building and grading. Although undesirable, wetland crossings are feasible provided they are properly engineered. A few buildings are proposed on Leicester soils. The seasonally high water table associated with these soils is the main engineering concern. A geotechnical survey should address the loading rates of this soil to support structures. Footing drains, underdrains and water stops should keep basements dry. Building in wetlands should be discouraged. Lots with a high degree of wetland soil might not have sufficient dry land for the property owner and may be subject to illegal filling.

Hydrology

Drainage from the site flows to the Housatonic River, the Wepawaug River and Beaver Brook. Beaver Brook feeds the Milford Reservoir. Surface waters are presumed to be Class A. Except for Beaver Brook which is Class AA, the site drains into waterbodies that are degraded. Groundwater on the site is Class GA and GAA in the Beaver Brook Drainage.

Development of the site will lead to increases in runoff. The surface hydrology will be changed significantly. The 2 main concerns are flooding and streambank erosion. The applicant intends to keep post-development flows at pre-development flow levels with 7 detention areas. These facilities will either be man-made and/or will use the disturbed areas in the southern section of the site. Gullying and erosion of steep slopes is another concern. Properly implemented and enforced erosion and sediment controls should reduce the problems. If the detention basins are designed to retain sediment, the 2-year storm should be analyzed in the hydrology study. Also, a plan for the detention basins, including who is responsible for operation and

maintenance, should be prepared. Detention basins located in wetland areas require a permit from the Commission.

Soil Resources

Most of the site was formed in glacial till and sand and gravel. The wetland boundaries flagged in the field are essentially accurate. The soil scientist was asked to reexamine 2 areas on the site where the Milford wetland boundaries and the consultants boundaries are in disagreement. The soils map with the plans did not include the upland soils. These should be provided as well as any test pit data. Agawam and Charlton soils have good potential for development, while Hollis, some Charlton, Leicester and Adiran and Palms muck have fair to poor potential for development.

Soil Erosion and Sediment Control

To illustrate the compatibility of the site and the soils, the site plans should be overlaid on a soils map. All erosion and sediment control measures should be included on the site plans. The extensive grading increases the risk of erosion on the site.

Wetland Considerations

There are 5 wetland areas directly affected by the development. The wetlands function as wildlife habitat, pollution filters and flood storage areas. Direct intrusions in the wetlands are minimal. Significant amounts of fill will be placed on steep slopes. A road crossing is proposed for the stream. Streamcourses near dwellings are often used by property owners to dump debris. Negative impacts could be minimized by reducing the density of the development or redesigning the layout. Runoff will be discharged into the wetlands. Erosion and sediment controls will be needed, and detention basins should be cleaned often. Suggestions include reducing the density or redesigning the layout of the condominiums, using splash pads and designing a maintenance schedule for the detention basins, placing easements or deed restrictions on the wetlands and reviewing alternative designs.

Forest Resources

Much of the forest has little value as sawtimber, but has value for wildlife habitat, watershed protection, climate amelioration and noise abatement. A 100-foot buffer of trees could reduce highway noise. The tree protection section of the Haley and Aldrich report is thorough. Tree preservation should begin before construction. Recommendations for plantings include diversifying the species, making tree lawns at least 4 feet wide and not planting close to intersections, driveways and utilities. Proposed open space areas should be connected rather than scattered.

Wildlife Considerations

Habitat on the site includes mixed hardwood forests, old fields and wetlands. The site offers a variety of food and cover to wildlife including deer, grouse, fox,

weasel, raccoon, coyote, various birds, reptiles and amphibians. The site offers good wildlife habitat because of the degree of interspersed habitats, including wetlands and uplands.

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, offices, parking areas and homes. Other impacts include the creation of lawns and the presence of humans, traffic, dogs and cats. Several detention basins are proposed for the site. If the detention basins are not maintained and become silted in, growth of vegetation might be stopped or limited. Because detention basins are usually designed to have water only after periods of heavy runoff and only retain that water for a short period, they do not provide a reliable source of water for wildlife. Unless a variety of desired species of vegetation can be provided along with water for some period of time, these basins will have little or no wildlife habitat value.

Islands of open space should be avoided. Open space should be connected to provide travel paths for wildlife. 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.

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" on the site.

Archaeological Considerations

The site is located in a critical area of importance to prehistoric Native American lifeways. Stone artifacts found during the field review indicate that an Indian encampment overlooking the Housatonic River was located on the site. Additional archaeological sites are predicted along the ridge. A Revolutionary War hospital and burying ground for British prisoners with smallpox also may be on the site. Open space or historic preservation easements should be established to protect this burial ground. It is strongly recommended that all feasible efforts be undertaken to identify and ensure the preservation of these important historic resources.

Planning Considerations

The site lies within 2 zones. The proposed development will require a zone change from light industrial to residential with special permits for the PRD design plans. The plans should include a basic list of site data to make reading the plans easier. The development falls within the middle of the range for density in the PRD Zone and well below the maximum density in the HDD Zone. Under the PRD Zone 30% of the total area should remain as open space. Under HDD Zone, 50% of the area should remain as open space. These figures should be included in the site data table. Active recreation consists of a playing field and tennis courts and a clubhouse. These features are desirable, but the tennis courts and field might not be adequate for

the size development proposed, and the clubhouse might have a significant impact on the surrounding wildlife habitat. There are several intrusions in the wetlands on the site. Considering the small size of these wetlands, there should be no intrusions. Detention basins should be moved out of the wetlands, and no living units should be built in the wetlands. The site will be served by 3 access roads. The surrounding roads may not be able to support the traffic from the development.

The proposed development appears to conform with some of the local zoning regulations, but the density selected has no clear supporting data that it is the best density for the site. The PRD includes duplexes, while the regulation permits only single-family residences. Perhaps an alternative design could be drawn to retain more of the natural vegetation throughout the project. Ideally, areas of natural habitat should be designated and the proposed development molded to fit the landscape.

TABLE OF CONTENTS

ACKNOWLEDGMENTS	ii
EXECUTIVE SUMMARY	iii
LIST OF APPENDICES	ix
LIST OF FIGURES	ix

INTRODUCTION

Introduction	1
The ERT Process	2

NATURAL RESOURCE CHARACTERISTICS

Location and Land Use	6
Topography	7
Geology	7
Geologic Development Concerns	10
Hydrology	16
Soil Resources	20
Soil Erosion and Sediment Control	21
Wetland Considerations	24
Wetland Area 1	24
Wetland Areas 2 and 3	24
Wetland Area 4	25
Wetland Area 5	25
Wetland Functions	25
Project Impacts	26
General Comments and Recommendations	27
Forest Resources	28
Tree Protection	29
Open Space Considerations	29

Wildlife Considerations	30
Description of Area/Habitats	30
Wildlife Habitat/Recommendations	33
Threatened and Endangered Plant and Animal Species	36

ARCHAEOLOGICAL RESOURCES

Archaeological Considerations	37
-------------------------------	----

LAND USE AND PLANNING CONSIDERATIONS

Planning Considerations	40
Proposed Zone Change	40
Compliance with Local Zoning Regulations	41
Wetland Impacts	44
Traffic and Circulation	44
Conclusion	45

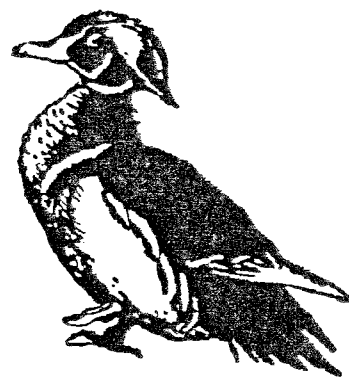
LIST OF APPENDICES

Appendix A: Soil Limitations Chart	
Appendix B: Suitable Planting Materials for Wildlife Food and Cover	

LIST OF FIGURES

1. Location of Study Site	4
2. Proposed Site Plan	5
3. Topography	8
4. Bedrock Geology	11
5. Surficial Geology	12
6. Watershed Boundary	17
7. Soils	22
8. Archaeological Sites	39

INTRODUCTION



INTRODUCTION

The Milford Inland Wetland Commission has requested that an environmental review be conducted on North Milford Village, a 156-acre site proposed for subdivision and condominium development. The site is located in northwest Milford near the Merritt Parkway and the Milford Connector. Access is provided by Oronoque Road, Zion Hill Road, North Rutland Road and East Rutland Road.

The developer proposes approximately 250 single-family homes and 64 multi-unit condominiums for a total of 419 dwelling units. Also proposed are tennis courts, a pool and a clubhouse. Approximately 2.5 miles of new road are proposed to serve the site. The site will be served by municipal sewer and water.

The site is an old farm with wooded areas and overgrown fields. The Milford Bowhunters use the western portions for a practice area. The southwest portions of the site contain some steep slopes. Several areas of wetlands are found scattered throughout the site. A CL&P right-of-way crosses the site near East Rutland Road. An area of the site is known locally as "Pox Hill." It is considered a burial ground for small pox victims from the Colonial/revolutionary era. The City is concerned with the impacts on the wetlands and surrounding ecosystem and the impacts on the neighborhood and traffic.

The primary goal of this ERT is to inventory the natural resources of the site and provide planning information. Specific objectives include:

- 1) Assess the topographic, hydrologic and geologic characteristics of the site, including the development limitations and opportunities;
- 2) Assess the impact of stormwater runoff on water quality;
- 3) Determine the suitability of existing soils to support the proposed development;
- 4) Discuss soil erosion and sedimentation concerns;

- 5) Assess the impact of the development on the wetlands and watercourses;
- 6) Assess the impacts of the development on the wildlife and habitat;
- 7) Discuss ways to preserve the character of the property including saving trees;
- 8) Discuss the archaeological and historical potential of the site;
- 9) Assess the impacts of the development on the traffic in the area; and
- 10) Assess planning and land use issues.

THE ERT PROCESS

Through the efforts of the Milford Inland Wetlands Commission, the developer's representative and the King's Mark 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 August 30, 1989. Field review and inspection of the proposed development 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 the Team members had assimilated an adequate data base, they were able to analyze and interpret their findings. The results of this analysis enabled the Team members to arrive at an informed assessment of the site's natural resource development opportunities and limitations. Individual Team members then prepared and submitted their reports to the ERT Coordinator for compilation into the final ERT report.

Figure 1

LOCATION OF STUDY SITE

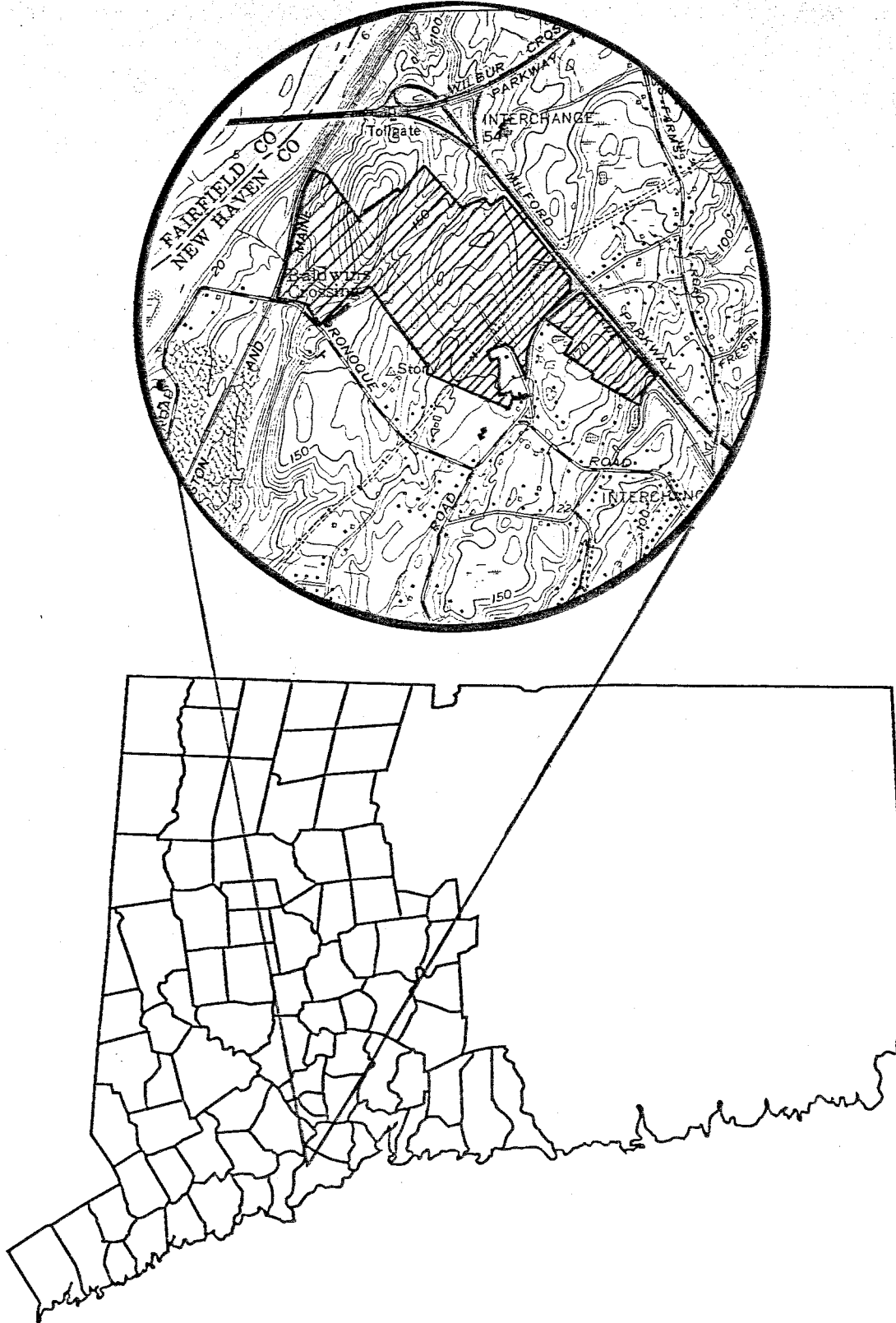


Figure 2



**NORTH MILFORD
VILLAGE**

MILFORD, CONNECTICUT

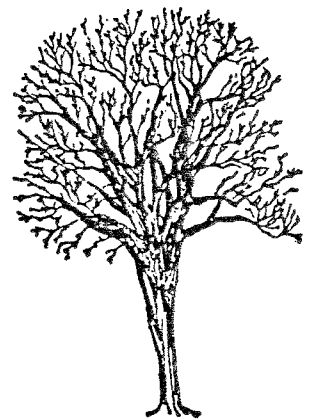
King's Mark Environmental Review Team

Scale: 1" = 400'

Proposed Site Plan

Information from Illustrative Plan,
Sasaki Associates, Inc.

PHYSICAL CHARACTERISTICS



LOCATION AND LAND USE

The proposed North Milford Village site is an approximately 156-acre, irregularly shaped parcel located in the northwest corner of Milford. The proposed residential development includes 250 single-family homes and 64 multi-unit condominiums. From its western boundary, the site lies about 200 to 1,000 feet east of the Housatonic River. Site boundaries include the Milford Connector on the northeast, Rutland Road on the east, Oronoque Road on the south and the Boston and Maine Railroad on the west. Additionally, the property borders single-family homes, private, wooded land and, in places, industrial property. A CL&P right-of-way bisects the central parts of the site from northeast to southwest.

The Sikorsky Heliport is located less than a mile northeast of the site. During the field review, numerous helicopters flew over the site. Noise pollution problems may be a concern to the future residents of the development.

A review of air photos dating back to 1934 indicates the site and vicinity included mainly agricultural land and low-density single-family homes. In 1934, the majority of the interior parts of the site comprised active farmland. By 1965, agricultural land uses decreased in the area and residential development, mostly single-family homes, increased, especially to the south.

According to the "Zone Change Plan," about 67% of the site presently comprises an R-30 zone which allows single-family homes on lots that are 30,000 square feet or larger. The remainder of the site, about 51 acres in the western parts, is zoned LI-30 which permits certain industrial land uses on lots 30,000 square feet or larger. In order to accommodate the proposed plan, a zone change is needed, mainly for the area zoned LI-30. The proposed change includes zoning 38.25 acres of the LI-30 zoned land in the western parts to HDD which allows the multi-unit condominiums. The remaining land zoned LI-30, 12.56 acres in the central parts,

will be changed to R-30. Since the proposed development is not compatible with the current zoning in the area, the zone change must be obtained by the applicant.

The proposed development will be served by public water from the South Central Water Authority and by public sewers tied into the Milford municipal system.

TOPOGRAPHY

The site topography is diverse. The western third of the site encompasses a streamlined, rock-cored hill (probably a drumlin) whose main axis is generally orientated in a north-south direction. The land surface for the remainder of the site is gentle. The steepest slopes are also concentrated on the east and west flanks of the streamlined hill in the western parts. Site elevations range from 180 feet above mean sea level atop the central hill to 50 feet above mean sea level along the railroad right-of-way at the western parts (see Figure 3).

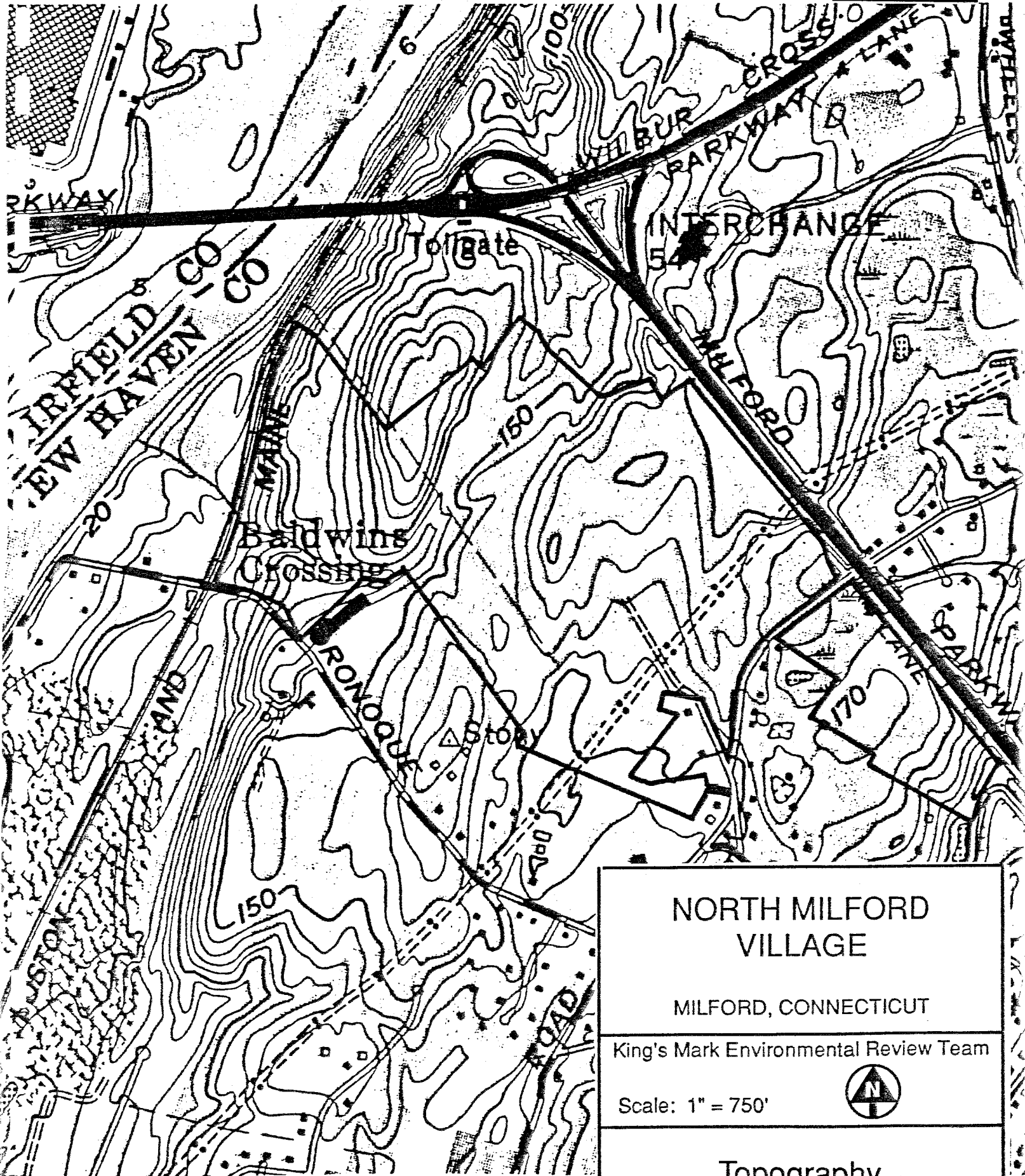
GEOLOGY

The site is located entirely in the Milford topographic quadrangle. A surficial geologic map (QR-23, by R.F. Flint) and a bedrock geologic map (GQ-427, by C.E. Fritts) have been published for the quadrangle by the Connecticut Geologic and Natural History Survey and U.S. Geological Survey, respectively.

Isolated areas of single bedrock outcrops occur on the site. For the most part, these outcrops coincide with areas where shallow to bedrock soils (Cr, Hp) occur and/or areas of steepest slopes.

Fritts identifies the bedrock underlying most of the site as Maltby Lakes Volcanics, a dark-gray to grayish black amphibolite. Major minerals in the rock

Figure 3



NORTH MILFORD
VILLAGE

MILFORD, CONNECTICUT

King's Mark Environmental Review Team

Scale: 1" = 750'

Topography

Information from USGS Topographic Maps,
Milford Quadrangle

include hornblende, quartz, epidote and sodic andesine. In lesser amounts, the rock includes the minerals sphene, ilmenite, rutile, apatite and pyrite. The western end of the property is underlain by Wepawaug Schist, which consists of a medium- to dark-gray medium- to fine-grained schist or phyllite (see Figure 4).

The terms schist, phyllite and amphibolite refer to the textural aspects of the rocks. All are crystalline, metamorphic rocks (rocks that have been geologically altered by great heat and temperature within the earth's crust). Phyllites are recognizable by a flaking, layered structure and silvery sheen indicating a high mineral content. Amphibolites are dark-colored rocks that are fine- to coarse-grained, massive to poorly layered and contain amphibolite and feldspar minerals. In general, little or no quartz exists in the rock. Schists are typically light, silvery to dark, coarse- to very coarse-grained, and their layering is usually defined by parallel alignment of mica minerals. Schists tend to be slabby, parting relatively easily along the surface of mineral alignments. These rocks are all very old (360-508 million years old) and have a long and complicated history. Since their formation, these rocks have been folded, tilted and subjected to faulting.

Depth to the bedrock surface on the site ranges from zero in outcrop areas to probably no more than 10 feet in most places.

The unconsolidated materials overlying bedrock on the site consist of till and stratified drift (see Figure 5). Till covers the majority of the site. In general, it consists of a brown to grayish brown mixture of sediments ranging in size from clay size particles to large boulders, but predominantly contains sand and silt. According to the New Haven County Soil Survey, the texture of most of the till on the site is generally sandy and loose. The till sediments were deposited by glacial ice as it moved across the bedrock surface from north to southeast. It is 10 feet thick or less in most places.

The Soil Survey identifies an area of soil (Af - Agawam fine sandy loams) in the southern parts of the site that is derived from stratified drift. Stratified drift is mainly comprised of sand and gravel and was deposited by meltwater streams emanating from glacier ice. These deposits are permeable and generally make good aggregate and fill material. The stratified drift deposits probably do not exceed 10 feet in most places. An air photo identified 2 excavation areas within these stratified drift deposits. In both areas the excavation penetrated to or below the water table.

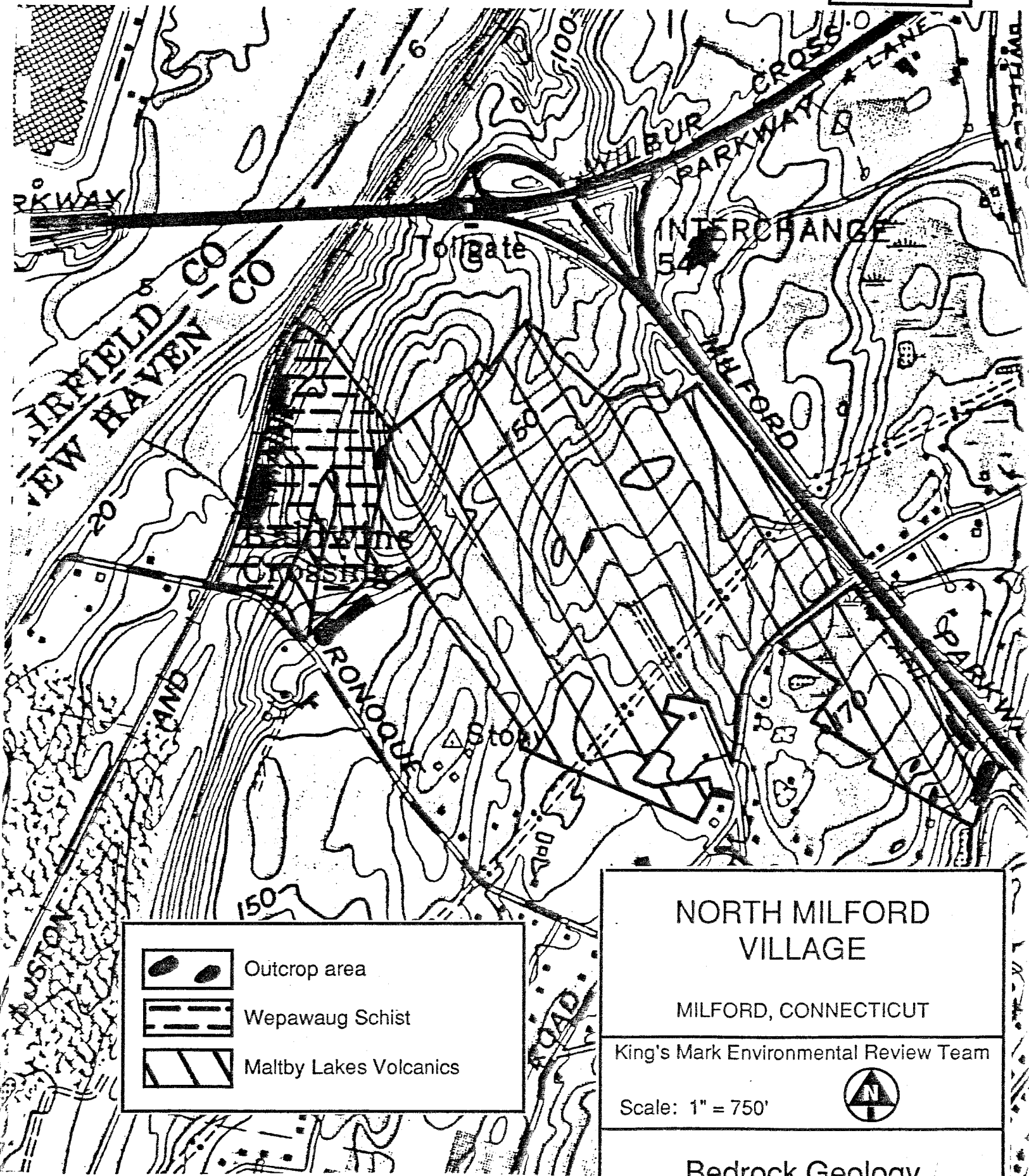
Regulated wetland soils that range from poorly to very poorly drained occur in 7 areas and have been flagged on the site by the applicant's technical staff. The major wetlands on the site include a relatively narrow band that parallels the unnamed perennial streamcourse in the western parts (this wetland fans out at the site's western border) and the wetland in the northeast corner which is bisected by East Rutland Road. On the southeast side of the road, this wetland is moderately deep and mucky. The remaining wetland pockets on the site are relatively small and are found in the northern limits, southeast limits and in the area of the former sand and gravel excavation area.


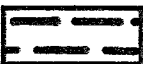

GEOLOGIC DEVELOPMENT CONCERNS


The proposed development will be served by public water from South Central Connecticut Regional Water Authority and by municipal sewers tied into the Milford system. The accessibility of these utilities will soften the principal hydrogeologic concerns usually associated with a development of the proposed magnitude. Nevertheless, there are potential hydrogeologic impacts that warrant careful examination. They include:

- 1) The presence of shallow to bedrock soils that may require blasting;

Figure 4

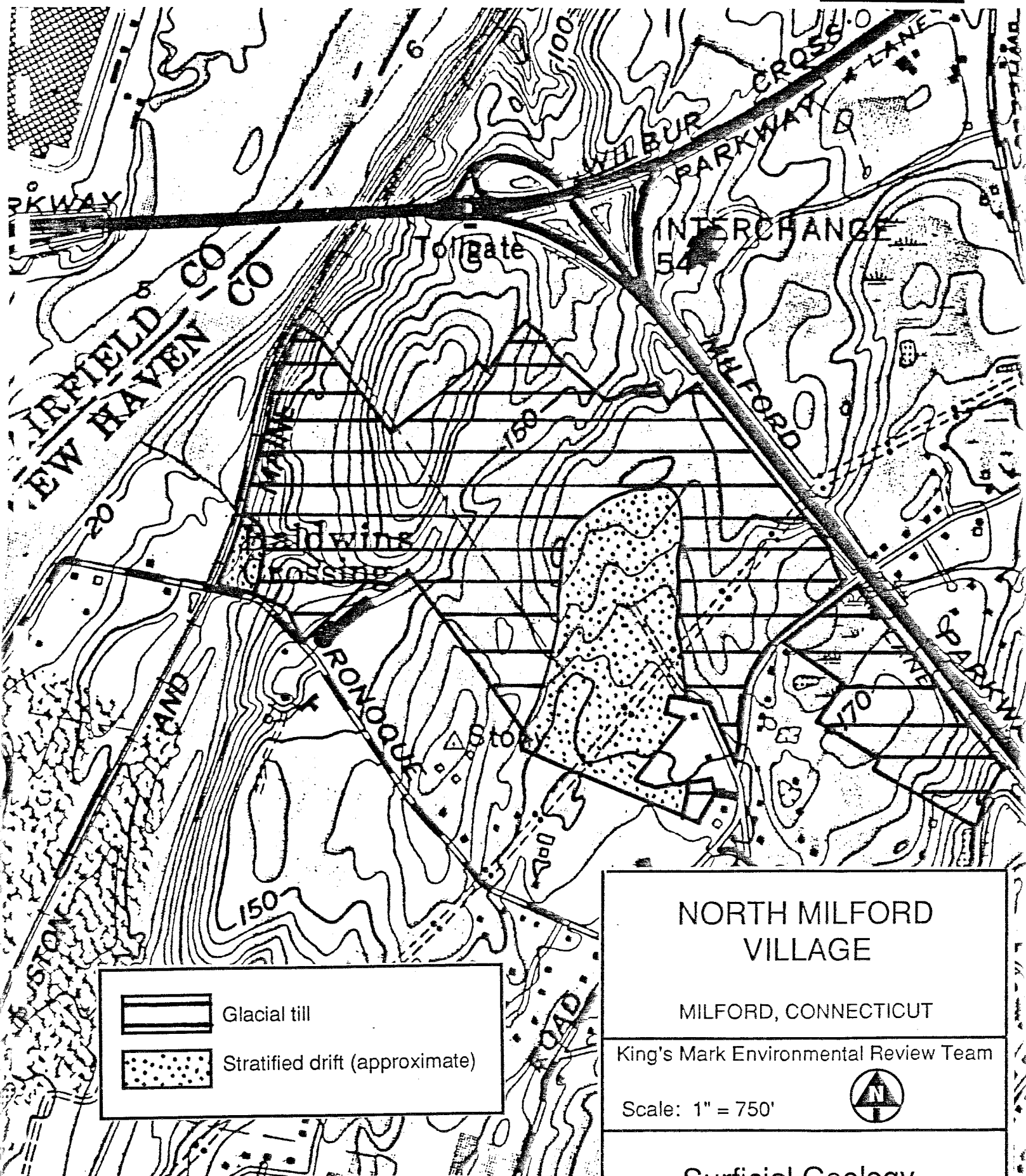


	Outcrop area
	Wepawaug Schist
	Maltby Lakes Volcanics

NORTH MILFORD VILLAGE	
MILFORD, CONNECTICUT	
King's Mark Environmental Review Team	
Scale: 1" = 750'	
Bedrock Geology	

Information from USGS Topographic Maps, Milford Quadrangle

Figure 5



Information from USGS Topographic Maps, Milford Quadrangle

- 2) The presence of moderate to steep slopes that may require substantial cuts and/or fills;
- 3) The presence of regulated inland wetland soils that will be affected in places by road, lot and house grading and filling and crossing by the proposed interior road; and
- 4) The presence of till soils, which may contain silt and clay sized particles, that when disturbed by water may become mobilized and cause environmental damage on- and off-site.

The presence of shallow to bedrock soils on the site suggests that blasting may be required in places in order to install electric, water and sewer lines, roads and house foundations. Any blasting that takes place on the site should proceed only with great care and under the strict supervision of persons experienced with the latest blasting technology.

The major concerns with blasting in the area will be the chance for undo seismic shock and airblast, which may damage nearby buildings, adversely affect water quality and quantity of nearby bedrock wells (if they exist) and make surface water turbid in the immediate blasting area. In order to establish background data and minimize unwarranted damage claims, a pre-blast survey of surrounding properties should be considered.

Certain blasting techniques can be used to minimize the environmental effects of blasting in an area, depending upon the blasting requirements and geology of the site. It is recommended that a detailed geotechnical study, including soil borings, be conducted on the site to determine which areas will require blasting and the texture and nature of the underlying bedrock. Additionally, if there is a need to blast bedrock and the blasted rock used for construction purposes (e.g., rip-rap, fill material, etc.) on- or off-site, it is recommended that tests be conducted to determine the acid mine drainage potential of the rock, especially if it comes in contact with surface and/or groundwater. The Maltby Lake Volcanics may contain minerals (i.e., pyrite) that

can lower the overall quality of water it comes in contact with and ultimately aquatic habitat.

The presence of moderate to steep slopes is a potential problem with regard to cut embankments for roads and placement of condominium foundations. Deep cuts may encounter bedrock in places resulting in the need for blasting. Also, a large area of land will be disturbed. For these reasons, there is a potential for erosion and siltation problems.

An Act Concerning Soil Erosion and Sediment Control (Public Act, 83-388), which became fully effective July 1, 1985, requires a detailed erosion and sediment control plan for the project. The erosion and sediment control plan should be properly monitored by the City. Because there is little opportunity for natural sediment retention on the west side of the site, any land disturbance in the area needs to be properly protected (i.e., silt fence, temporary sediment basins). Silty soils reaching the streamcourse on the site will be transported to the Housatonic River with little or no opportunity for natural sediment retention.

The construction of buildings on steep slopes or near rock cut embankments should be addressed from a geotechnical standpoint. Slope failure or rock slide must not pose a threat to public health and safety.

According to the plans, regulated wetlands will be affected (i.e., filled, modified, etc.) due to road and building construction and by grading for these structures. The exact amount of wetland disturbance resulting from this activity is unknown.

Based on the present interior road layout, wetland soils will be crossed in order to develop the site. A total of 80 linear feet of Leicester soils will be crossed. In general, the Leicester soils are poorly drained and have a stony, fine sandy loam texture. The major limitation of these soils is a seasonally high water table at a depth of about 0 to 1.5 feet from November to May.

Although undesirable, wetland crossings are feasible, provided they are properly engineered. The road should be constructed adequately above the surface elevation of the wetlands, allowing for better drainage of the road and decreasing the frost heaving potential. Road construction through wetlands should be done during the dry time of the year and should include provisions for effective erosion and sediment control. Any unstable, organic or mucky material should be removed and replaced with a permeable road base material. Culverts should be properly sized and located to prevent altering the water levels in the wetland or causing flooding problems.

Classified inland wetland soils in Connecticut are regulated under the Connecticut Inland Wetlands Act. Any activity which involves modification, filling, removal of soils, etc. will require a permit and ultimate approval by the Milford Inland Wetland Commission. In reviewing a proposal, the Commission needs to determine the impact that the proposed activity will have on the wetlands. If Commission members determine that the wetland is serving an important hydrological or ecological function and that the impact of the proposed activity will be significant, they may deny the activity altogether, or at least require measures that would minimize the impact. Every effort should be made to determine whether or not feasible and prudent alternatives exist. If they exist, these opportunities should be carefully studied and considered by the applicant and City officials.

In a few areas, buildings are proposed over the Leicester soils where a high water table occurs much of the year. Seasonally high water tables are an engineering concern in terms of building construction. If residential units are constructed on the Leicester soils, a geotechnical person should investigate the potential of these soils to support the proposed buildings.

Soil testing in the wetland areas is warranted to determine soil textures, composition, depth to the water table and the loading rate of the soil. If buildings are

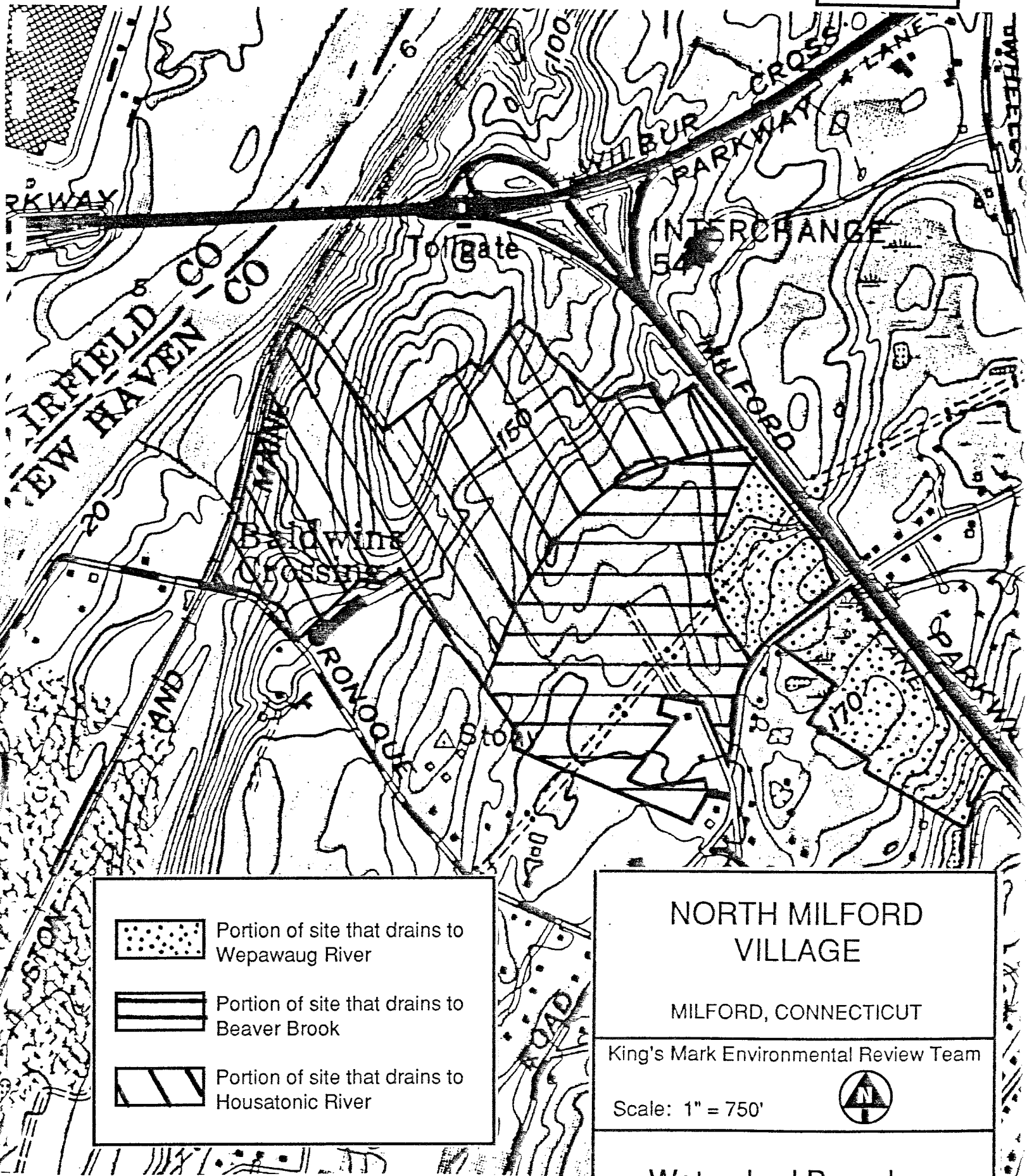
permitted on the wetland soils, all foundations should have both exterior footing drains and an interior underdrain system. Water stops should be placed between walls and footings. This should keep basements dry. Even with these engineering measures, the construction of buildings on wetland soils should be discouraged. The destruction of a wetland due to grading and filling will take away any of the natural hydrological or ecological functions that it may be presently performing in the drainage area. Also, residential lots containing a high percentage of wetland soils might not have a sufficient amount of "dry," usable land for the property owner. Often gradual encroachment on the remaining wetlands occurs due to the landowners desire to expand their space.

HYDROLOGY

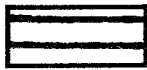
The site can be divided into 3 major watersheds: surface runoff in the western third of the site drains to unnamed tributaries that route the water to the Housatonic River, the interior section of the site drains to Beaver Brook which feeds Milford Reservoir (an inactive public water supply reservoir) and surface runoff in the eastern third of the site drains to an unnamed tributary to Baldwin Swamp (see Figure 6). The outlet stream for Baldwin Swamp flows to the Wepawaug River. Based on the hydrogeologic setting of the site, the subsurface flows should closely mimic surface flows. For the purpose of stormwater management, the applicant's engineer has divided the site's watershed into 14 subwatersheds.

Surface waters on the site are presumed to be Class A streamcourses by the Department of Environmental Protection (DEP) (Water Quality Classification of Connecticut, Murphy, 1987). Class A surface waters are suitable for drinking water supply and/or bathing, are suitable for all other water uses, are characterized

Figure 6



Portion of site that drains to Wepawaug River



Portion of site that drains to Beaver Brook



Portion of site that drains to Housatonic River

NORTH MILFORD VILLAGE

MILFORD, CONNECTICUT

King's Mark Environmental Review Team

Scale: 1" = 750'



Watershed Boundary

detention basins that will require excavation to determine subsurface conditions (i.e., depth to bedrock, depth to water table, depth to hardpan, soil mottling, etc.). This information will be useful in designing the basins. The Connecticut Guidelines for Soil Erosion and Sediment Control, 1987 should be used as a guide in designing detention basins, paying special attention to Chapters 8 and 9.

Another concern with post-development runoff is the potential for gullying and streambank erosion. Because of the moderate to steep slopes, the till soils that contain silt and clay sized particles and the large area of disturbance, the potential for erosion is great. The development proposed on the steep slopes in the western third of the site is of special concern. In order to minimize erosion problems and surface water quality degradation, a carefully designed and detailed erosion and sediment control plan should be developed, closely followed and periodically checked by City officials.

Conscientious construction practices should be employed in order to prevent water quality problems in streamcourses on- and off-site. Detention basins may be designed to serve a sediment retention function as well as detain stormwater.

The detention/sediment facilities should be properly maintained. A plan of operation and maintenance should be prepared by the applicant to ensure that each component functions properly. The plan should include outlet areas and provide requirements for inspection, operation and maintenance. Additionally, the plan should be prepared before the basin is installed and specify who is responsible for maintenance. Adequate rights-of-way for maintenance vehicles to the detention/sediment basins should be shown on the plans, whether on private land or on land dedicated to the City. Every effort should be made to install safety features and devices, if necessary, and to ensure that the detention basin is visually compatible with the surrounding landscape. Since some of the detention areas are located in regulated wetlands, construction of the detention basins will require a

permit from the Milford Inland Wetland Commission. In reviewing the proposal, the Commission needs to determine the biologic, hydrologic and ecologic impact the basin will have on the wetlands, especially following storm events.

SOIL RESOURCES

Most of the proposed North Milford Village site was formed in glacial till, sand, and gravel derived from gneiss and schist. These areas are composed of shallow (< 20 inches) to deep (> 60 inches), gently sloping to steep, somewhat excessively drained to poorly drained soils (see Figure 7). The soils underlain by glacial till have steep slopes (3 to 35%). There is a north-south running outwash terrace beginning near the geographic center of the site (the proposed "village green" area), which was formed in a loamy mantle over sand and gravel derived from gneiss, schist, and phyllite. The soils in this outwash area have slopes ranging from 3 to 8 %. There are 2 major wetland soil areas at the site. One area straddles East Rutland Road in the eastern part of the site and the other area runs south and curves around to the west near the Boston and Maine Railroad north of Oronoque Road in the western part of the site. There are 2 smaller poorly drained areas on the southern part of the property.

The field review showed that the wetland boundaries on the Sasaki & Associates, Inc. site plan are essentially accurate. Haley & Aldrich, Inc. (personal communication during the field review with Andrew W. Lord, Staff Scientist) has been requested to re-examine 2 wetland areas in the western portion of the site. The first request deals with a proposed road crossing and the other with a proposed building lot. Both involve resolution of the discrepancy between the municipal wetland boundary and the surveyed wetland boundary (as flagged by Chris Harriman, Haley & Aldrich, Inc.).

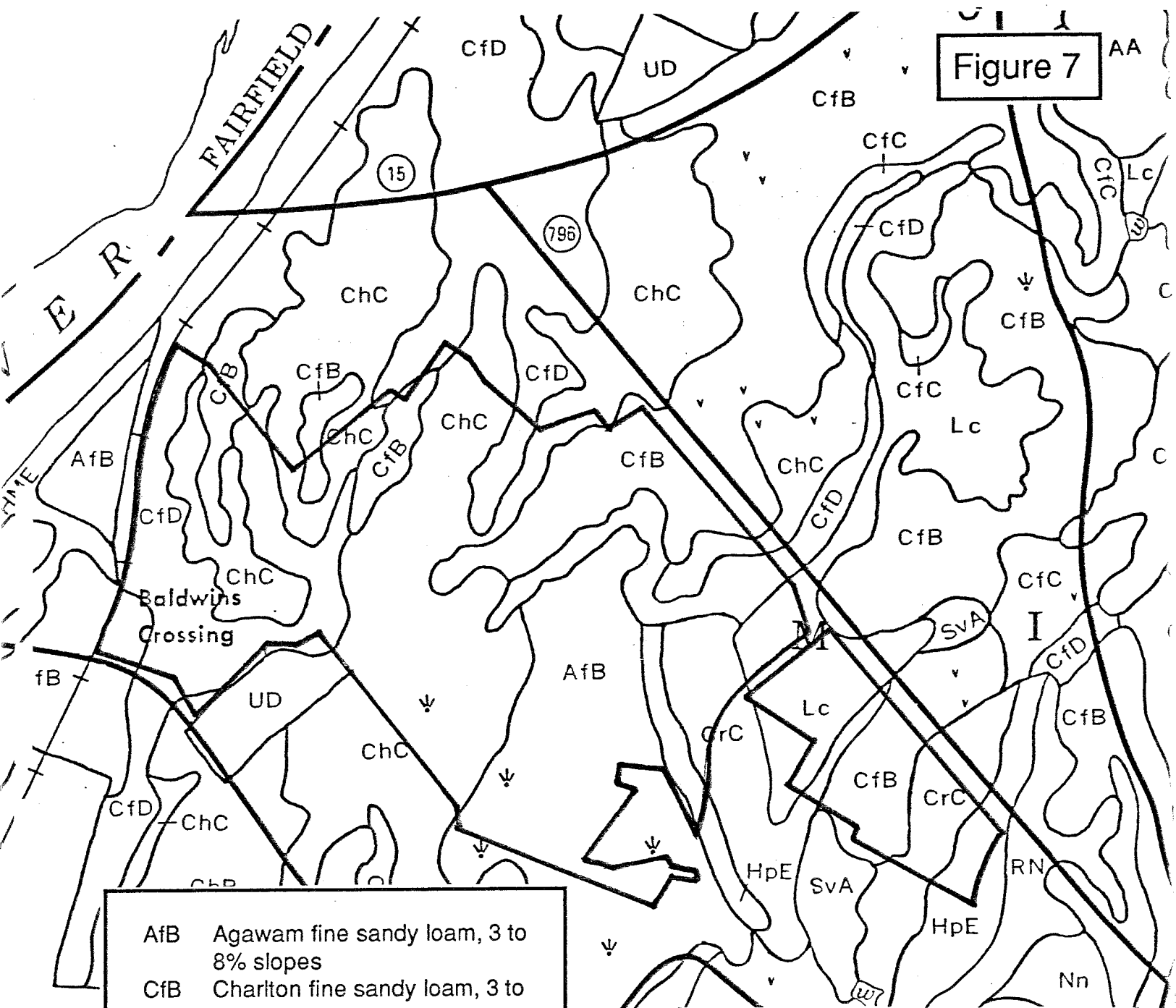
The Sasaki & Associates, Inc. plan mapped well drained soil types but did not include the poorly drained soil types within the wetland boundaries. The preliminary report submitted by Haley & Aldrich, Inc. showed the poorly drained soil types but did not include the well drained soils. A complete soil map should be provided. The Haley & Aldrich, Inc. preliminary report found a Sutton fine sandy loam (Sv) on the site. This soil is not shown on the site soils plan submitted by Sasaki & Associates, Inc. or the Soil Survey of New Haven County, CT (SCS, 1979). To resolve any further discrepancies in locating wetland boundaries and soil types, data from any test pits should be provided.

Appendix A shows the limitations characteristic of the soils shown on this plan. The Agawam (AfB) and Charlton (CfB, Charlton part of CrC and HpE) have good potential for residential development. The Charlton (CfD, ChC) Hollis part of the CrC and HpE, Leicester (Lc) and Adrian and Palms muck (Aa) have from fair to poor potential for residential development and require intensive erosion and sediment control measures to prevent excess runoff and erosion and siltation during construction. Unfavorable conditions that will require special attention include steepness of slope, large stones and shallow depth to bedrock in the Hollis soils.

SOIL EROSION AND SEDIMENT CONTROL

In 1983 the Connecticut General Assembly passed Public Act 83-388, "An Act Concerning Soil Erosion and Sediment Control," which makes erosion and sediment control planning and implementation mandatory. This effort is aimed at "reducing the danger from storm water runoff, minimizing nonpoint sediment pollution from land being developed, and conserving and protecting the land, air, and other environmental resources of the state." Chapter 1, Part F, Section 4 (4.1, 4.2a-c) of The Connecticut Guidelines for Soil Erosion and Sediment Control (Connecticut Council

Figure 7




AfB	Agawam fine sandy loam, 3 to 8% slopes
CfB	Charlton fine sandy loam, 3 to 8% slopes
CfD	Charlton fine sandy loam, 15 to 25% slopes
ChC	Charlton very stony fine sandy loam, 8 to 15% slopes
CrC	Charlton-Hollis fine sandy loam, 3 to 8% slopes
HpE	Hollis-Charlton fine sandy loam, 3 to 8% slopes
Lc	Leicester fine sandy loam, 0 to 3% slopes
Aa	Adrian and Palms muck, <1% slope

NORTH MILFORD VILLAGE

MILFORD, CONNECTICUT

King's Mark Environmental Review Team

Scale: 1" = 750'



Soils

Information from New Haven County Soil Survey, Scale: 1" = 1320'

on Soil and Water Conservation, 1987) and the New Haven County Soil and Water Conservation District Sediment and Erosion Control Worksheet should be used as a guide in developing a soil erosion and sediment control plan.

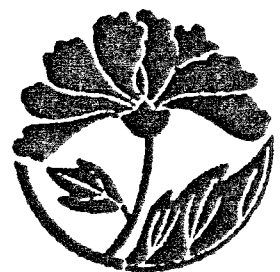
To better illustrate the compatibility of the site and the soil, a site plan showing building lots and setback lines, roads, proposed elevations, proposed sediment and erosion control measures, etc., should be overlain by a soil map. Proposed building lots should be numbered to facilitate a reviewer's reference to specific problems on these individual lots. Each sheet of a site plan should have a legend with descriptions of symbols appearing on the plan.

To complete the Sediment and Erosion Control Plan on sheets C9-1 through C9-3 of the site plan, all proposed erosion and sediment control measures should be located, including:

- 1) Sediment barriers (haybales and silt fences);
- 2) Construction entrances;
- 3) Diversion swales and roadway interceptor swales; and
- 4) Sedimentation traps.

The extensive grading necessary to develop this property combined with the steep slopes and shallow to bedrock soils (Hollis part of the CrC and HpE soil units), increases the risk of soil erosion. Topsoil may have to be brought in to vegetatively stabilize areas where shallow to bedrock soils exist or topsoil has been removed. The fertilizing, liming, seeding and mulching rates for areas to be graded should appear in the plan. The location and method of stabilizing temporary stockpiles of topsoil and fill material should also appear in the plan.

BIOLOGICAL RESOURCES



WETLAND CONSIDERATIONS

Wetlands comprise approximately 12 acres of the 156-acre site. The developer proposes 250 single-family homes and 64 multi-unit condominiums. The wetland areas are scattered throughout the site, differing in their physical composition and functional values. The fragmentation of wetland/watercourse areas is a result of many factors (i.e., the Milford Connector, the CL&P right-of-way, past agricultural uses and sand and gravel operations).

There are 5 major wetland areas that are directly or indirectly affected by the proposed development.

Wetland Area #1

Located near the southeast corner of the site, just west of the Milford Connector, this wetland area is divided by East Rutland Road. The wetland on the north side of East Rutland Road is classified by the National Wetlands Inventory as a seasonally saturated, broad-leaved deciduous scrub/shrub swamp. However, its vegetative appearance is much like the wetland on the south side of East Rutland Road which is classified as a seasonally saturated, mixed deciduous, forested swamp. The dominant tree species include Red Maple and American Elm with an understory of spicebush, sweet pepperbush and highbush blueberry. The ground cover consists of an assemblage of ferns, skunk cabbage and various sedges and rushes.

Wetland Areas #2 and #3

Located in the central portion of the site, wetland area #2 is the Phragmites dominated shrub swamp. Just northwest is wetland area #3, a shallow marsh vegetated primarily by various species of rushes and grasses and tussock sedge. Some level of standing water is present during most of the year in wetland area #3.

Wetland Area #4

A small stream flows northwest from wetland area #3 into wetland area #4 which is a mixed deciduous swamp, dominated by red maples and various species of elm. Typical species occupying the understory are spicebush and highbush blueberry. An area of land bordering the swamp to the west which would connect the swamp to a perennial streambelt to the west is currently under dispute concerning its status as a wetland. The soils in this disputed area are most likely transitional. It is recommended that another soil scientist investigate this area to resolve any uncertainty regarding whether or not it is a regulated area.

Wetland Area #5

Wetland area #5 is a perennial streambelt located near the northwest corner of the property. Situated on moderately steep slopes, this well defined wetland corridor eventually runs into the Housatonic River. A well established canopy has prevented the growth of a thick understory with the exception of some saplings and spicebush.

Wetland Functions

The variety of habitat types on this particular parcel (i.e., shrub swamps, mixed deciduous swamps, shallow marshes, open fields, wooded uplands, open water bodies and streambelt corridors) serves to increase the number and diversity of wildlife species utilizing this area. Wetlands offer a stable environment during times of climatic extremes providing food, shelter and reproductive opportunities to wildlife.

The wetlands on this property also provide pollution abatement functions. Upland runoff is detained in the broad flat terrain of the wetlands, allowing sediments and other pollutants to settle out prior to entering streams. This function becomes increasingly important upon the construction and placement of impervious surfaces such as roads, rooftops and tennis courts. The wetlands on the western portion of the site are particularly important with respect to pollution filtration

because waters eventually enter the Housatonic River which the DEP plans to upgrade.

Wetlands also have the ability to store large volumes of stormwater and release this water slowly over a period of time, alleviating the danger of downstream flooding. Project generated increases in the volume of water entering wetlands heighten the importance of their flood management function.

Project Impacts

Generally speaking, direct intrusions into the wetland/watercourse areas are minimal. The exception to this is in the area of the proposed condominium complex. Significant amounts of fill are to be placed on the steep slopes to accommodate construction of the individual units and detention basins. Additionally, a road crossing is proposed to access units on the south side of the streambelt. The construction activities associated with this part of the project have the potential to negatively alter the stream corridor. Also, stream corridors located in close proximity to dwelling units are typically used by tenants and maintenance personnel for dumping brush, grass clippings and other debris.

These negative impacts could be eliminated or significantly reduced by decreasing the number of condominium units and redesigning the layout of the units to eliminate the need for placing fill within the stream corridor. An alternative might be eliminating the units south of the streambelt. Also the detention basin north of the streambelt could be moved further north, eliminating the need for fill in the streambelt.

Another concern is the discharge of site runoff into the wetlands. Without the proper erosion and sediment controls, exposed earth during construction may cause excessive amounts of sediment to enter wetlands and watercourses, hindering their functional capabilities. Also, following the construction of impervious roads and rooftops and the creation of manicured lawns, the potential for runoff to pollute the

wetlands is great due to the oils, greases, fertilizers and pesticides that it may convey.

Detention basins have a tendency to become excessively laden with sediment that may flush out into wetlands and watercourses during large storm events. Detention basins and catch basins should be cleaned frequently during construction to prevent sediment from polluting any of the regulated areas on the site. A maintenance schedule should be established and strictly enforced by the City. Rip-rap energy dissipaters should be installed at outlet points to reduce the risk of erosion.

Access to the property via Zion Hill Road on the southeast corner of the site will require some filling and grading of wetlands associated with a large pond. This road location appears necessary because of traffic concerns. Proper erosion and sediment controls should be employed to avoid polluting the wetlands and the pond.

General Comments and Recommendations

While this project is large in scope, much of the activity has been kept out of regulated areas. The major concern to the east is discharge of stormwater into wetlands and the potential for excessive sedimentation to occur. On the western portion of the property, the concern is the extensive filling and grading to accommodate the condominium portion of this project. Some suggestions for reviewing this project include:

- 1) The density and close proximity of the condominium units to the streambelt has the potential to cause severe degradation to this wetland corridor. The density could be reduced and the layout redesigned to eliminate filling and grading into this wetland/watercourse channel.
- 2) The direct discharge of stormwater into wetlands and watercourses poses a threat to the functions they provide. Excessive amounts of sediments and other pollutants may enter wetlands and reduce the quality of these important areas. Rip-rap splash pads should be installed at discharge points and additional erosion and sediment controls should be implemented appropriately. Also, a maintenance schedule for cleaning out catch basins and detention basins should be established and strictly adhered to.

- 3) Consider placing conservation easements and/or deed restrictions on all lots containing wetlands to avoid intrusions by future property owners.
- 4) The Commission should require that the applicant provide alternative designs to the current proposal, along with a discussion including why each alternative was considered and why or why not each is feasible and prudent (this would include alternative lot layouts, alternative road configurations and alternative detention areas). Connecticut General Statutes Section 22a-41(b) requires that in the case of an application which received a public hearing, a permit shall not be issued unless the Commission finds that a feasible and prudent alternative does not exist. Therefore, the Commission should not issue a permit if a feasible and prudent alternative exists, and it is the responsibility of the applicant to provide alternative designs for the Commission to consider.

FOREST RESOURCES

The vegetation type map and the descriptions of the tree and shrub species in the report by Haley and Aldrich, Inc. are essentially correct.

Most of the forestland has little value for commercial sawtimber because of the low stocking level and the lack of desirable species. However, the forest resources are valuable in providing wildlife habitat, watershed protection, climate amelioration and noise abatement.

Reducing noise levels is especially important in the area that borders the Milford Parkway. Trees can decrease objectionable noise in several ways. Leaves, branches and trunks absorb sound energy, especially the higher frequencies that are most objectionable to humans. Furthermore, forests produce their own sounds when wind rustles leaves and birds sing, masking the undesirable noise generated by a highway. It is generally recommended that a minimum 100-foot buffer of trees and shrubs be used to create a meaningful reduction in noise between high speed traffic and a residential area.

Tree Protection

The tree protection information in Appendix B of the Haley and Aldrich, Inc. report is quite thorough. The report explains that trees which are to be preserved should be selected beforehand, clearly marked and well protected throughout construction. Too often, well-intentioned builders try to keep as many trees as possible without protecting them, so that 2-3 years after houses are built, the trees die, saddling the home owners with expensive bills for tree removal and replacement. As noted in the appendix of the Haley and Aldrich, Inc. report, a plan for tree preservation should be completed before land clearing begins. A qualified individual, such as a forester or landscape architect, should select the trees to be saved and delineate a protection zone around them.

Recommendations for the planting of street trees include:

- 1) Do not plant more than 15% of the tree population with a single species. This decreases the likelihood of an insect or disease epidemic that could decimate entire blocks of trees, as happened with the American elm several decades ago.
- 2) Make tree lawns at least 4 feet wide to give trees room to grow without ruining sidewalks or being hit by vehicles.
- 3) Do not plant trees within 30 feet of an intersection or 15 feet of a driveway.
- 4) Do not plant trees within 10 feet of utility poles or fire hydrants.

Open Space Considerations

Land to be set aside for open space should be connected rather than scattered in separate blocks. This improves both wildlife habitat and recreational possibilities such as creating a trail for hiking, cross-country skiing, biking, etc.

WILDLIFE CONSIDERATIONS

Description of Area/Habitats

The 156-acre site proposed for development contains a variety of habitats including forest, old field, various wetland areas and a section of powerline easement that is maintained in shrub/scrub stage vegetation. The site lies just east of the Housatonic River and contains gently sloping land as well as some steep slopes.

Wildlife habitat is said to be the complex of vegetative and physical characteristics that provides 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. Although the site has been badly abused by people dumping garbage, trash and junk cars, it does provide some degree of diversity of habitats and in general provides good wildlife habitat.

The abundance and variety of wetlands on the site increases its value for wildlife. The dumping of trash, although probably more disturbing from an aesthetic point of view, can have a negative effect on wildlife. Occasionally wildlife may become entangled in the trash, and if certain types of trash are not disposed of properly, they could contaminate water and soil, affecting wildlife.

Many wildlife species are expected to utilize the site to serve all their needs, while many more find it a place to meet some requirements. Species which could use this area include deer, ruffed grouse, weasel, raccoon, fox, coyote, various hawks, owls, catbirds, sparrows, juncos and chickadees. A variety of reptiles and amphibians could also use the site.

A detailed description of the vegetation found within the different habitats can be found in the report produced by Haley and Aldrich, Inc.

Forest: A large portion of the site is covered by mature mixed hardwoods. Areas of younger age classes are also present due to logging, gravel mining and a small fire. The mixed hardwood forest contains oak, beech, maple, tulip, cherry and a variety of other species. Mixed hardwood forest provides cover, nesting, roosting and den sites for a wide array of wildlife. In addition, various tree and shrub species provide valuable food in the form of mast, fruits, catkins, buds and twigs. Mast is an important food source for many types of wildlife, especially during the fall and winter when other food sources are not available and/or in short supply. Some parts of the forest have a fairly thick understory of shrubs and small trees. This diversity of foliage heights encourages a diversity of wildlife use, especially for songbirds. In general, the greater the foliage height diversity, the greater the diversity of songbirds there is using an area.

The snag trees in the area (dead trees) are a source of insects which serve as food for many species such as woodpeckers and chickadees. Den trees or trees with cavities can serve as a nesting or denning place for animals such as squirrels and raccoons.

In areas where the forest land has been disturbed, growth of shrubs, vines and young trees is very thick. The area under the powerline is maintained in a shrub/sapling stage and is very thick. These areas provide good habitat for a number of birds, because of the variety of nesting sites and the abundance of food in the form of berries and catkins.

Old Fields: The old fields provide early successional stage habitat, an important habitat type because it contains a variety of plant communities including grass, herbaceous plants, shrubs and young trees. The abundant growth of a variety of shrubs such as blueberry, multi-flora rose, witch hazel and trees such as cherry, aspen and sumac provide abundant cover and a food source for a variety of wildlife.

Small mammals including mice and voles inhabit areas of old field. These areas are used as hunting grounds for species such as hawks, owls, foxes and coyotes.

These areas not only increase the overall habitat diversity, they also increase the "edge" or "edge effect." Edge effect is the phenomena that occurs where vegetational types meet with a high degree of interspersion and vegetational diversity or richness is achieved. Because of this phenomena, the needs of a wide variety of wildlife can best be met.

Wetlands: Because wetlands increase the habitat diversity of an area and offer a variety of food and cover to wildlife, they are important areas to consider for conservation. Acre for acre, 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, flood storage, etc. For these reasons, the development, filling in and/or crossing of wetlands should be avoided or limited whenever possible.

A detailed description of each of the 5 various wetland sites is given in the Haley and Aldrich, Inc. report. The wetlands found on this site include the deciduous wetlands, wetland areas associated with the streambelt and the intermittent watercourses and a shallow marsh area.

Because of the diversity of the wetlands found on the site, a variety of habitat is provided for a wide range of species. These types of areas are important to a wide array of amphibians, reptiles, mammals and birds. Mammals such as the fox and raccoon use these areas to forage and hunt. Browsers such as deer feed in these areas on the diversity of vegetation. Wetlands are attractive areas for a variety of birds because of the abundant food in the form of berries, seeds and catkins found here. Wetlands with seasonally standing water can be important places for amphibian and reptile reproduction. Wetlands that hold water over a longer time

period and support a greater diversity of vegetation tend to provide more valuable wildlife habitat.

Wildlife Habitat/Recommendations

As with any development, the impact on wildlife habitat will be negative. The impact at this site will probably be extensive because of the magnitude and density of the proposed development. Large portions of the area will be broken up and lost with the construction of homes, condominiums, parking garages, roads, parking lots and walkways. Additionally, 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. The value of the site for wildlife habitat decreases correspondingly as the amount of development in the area 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.

Because of the importance of wetlands to wildlife and the fact that wetlands are limited in quantity and continue to dwindle on an almost daily basis in the State of Connecticut, it is always preferably to chose the option or path of development that least affects wetlands. The value of wetlands increases as the quantity of the resource diminishes. A buffer of at least 100 feet is recommended around any wetland to preserve its value as wildlife habitat.

Disturbance to wetlands should be minimized both before development and after development. Post-development homeowner activity in the wetlands should be avoided, if possible, through a conservation easement or deed restriction. Activities

such as pasturing animals in a wetland or filling in for extra lawn and/or garden should be restricted.

Several detention basins are proposed for the site. As proposed, the detention basins will probably have little value as wildlife habitat. Shallow grassed-in basins provide little wildlife habitat. Rip-rap basins with no vegetation provide no wildlife habitat. Basins replanted with wetland vegetation may offer something to a few species of wildlife, but typically will not duplicate the function of a naturally created wetland with its own unique hydrology and vegetational diversity. If the detention basins are not maintained and become silted in, growth of planted vegetation might be stopped or limited. Because detention basins are usually designed to only have water after periods of heavy runoff, and only retain that water for a short period, they do not provide a reliable source of water for wildlife. If no alternative to the proposed detention basins such as on-site drainage is found, then constructing detention basins which can maintain some level of water in them should be considered. With a continuous pool of water, a greater variety of vegetation can be sustained, and the detention basins will probably be useful to a greater, but limited, variety of wildlife. Destruction of functioning wetlands to create detention basins is not recommended because of the habitat loss sustained in the process.

Open Space Areas: Whatever type or combination of habitat types set aside, setting aside an "island of open space" surrounded by development is the least desirable for wildlife. The open space area should have natural travel pathways for wildlife (such as streams, valleys and ridgetops) to enter and exit to other open space areas outside the development. The open space area is more valuable to wildlife if not traversed by roads which may impede the movement of wildlife at times. Setting aside a combination of habitat types in conjunction with wetlands is desirable.

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 in order to minimize adverse impacts on wildlife. Despite these measures, wildlife habitat will increasingly be adversely affected as the amount of development increases on a site. The measures include:

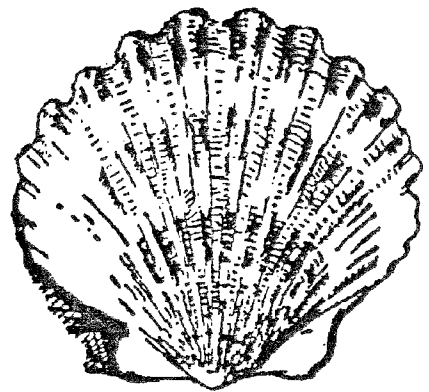
- 1) Maintain a 100-foot (minimum) wide buffer zone of natural vegetation around all wetland/riparian areas to filter and trap silt and sediments and to provide some habitat for wildlife.
- 2) Utilize natural landscaping techniques (avoiding lawns and associated chemical runoff) to lessen acreage of 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 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, 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) Shrubs, trees and vines 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). 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.

THREATENED AND ENDANGERED PLANT AND ANIMAL SPECIES

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

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 Geological and Natural History Survey and cooperating units of DEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. 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 CONSIDERATIONS

A review of the State of Connecticut Archaeological Site Files and Maps indicates a series of prehistoric Native American and early historic sites in the immediate vicinity of the proposed development site. West of the site, across the railroad tracks and north of Baldwin's Crossing, lies a large Indian village dating back approximately 1,000 years. North of the Merritt Parkway is a prehistoric site dating to over 10,000 years ago. The lower Housatonic River Valley has more than 20 archaeological sites located in Milford and Stratford alone. The prominent knoll that overlooks Baldwin's Crossing and the Housatonic River is an extremely sensitive area to archaeological remains. The 10,000-year-old encampment to the north is situated on a similar hilltop. In addition, a couple of pieces of flint and quartz debitage were located during the field review. These stone flakes are the waste products of the stone tool manufacturing process. They were located along a dirt road cut on the western hill (see Figure 8).

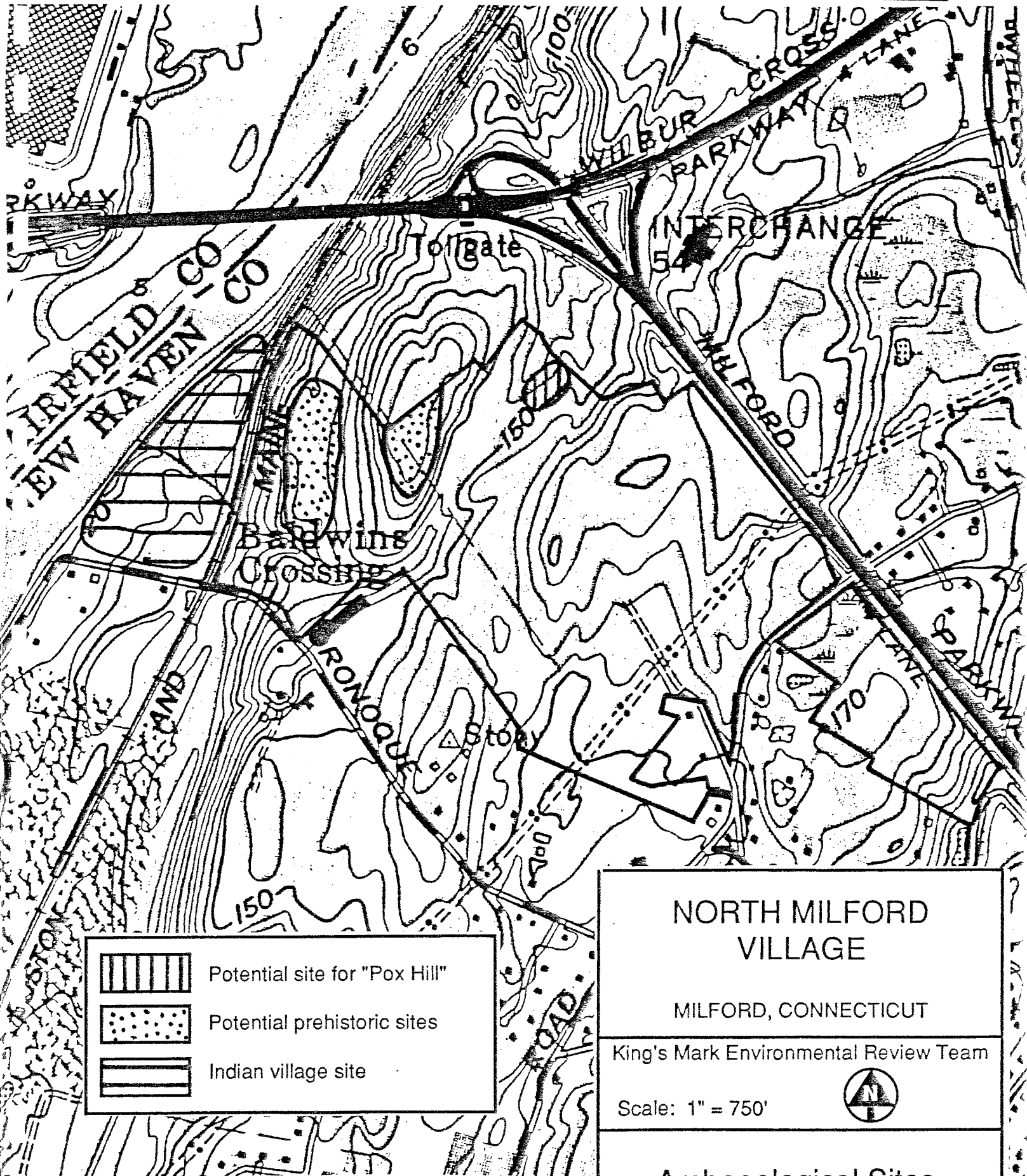
Oral traditions among local historians suggest that a Revolutionary War burial ground exists on the site. The area is referred to as "Pox Hill" and appears to be the burial site for a number of British soldiers who died of smallpox. Historical documents record that British soldiers were hospitalized in Milford during the Revolutionary War and that many of them died from smallpox. However, the documents do not mention where the victims were buried. It is very likely that they were treated in a remote area north of the main City. The site would have been a desirable location for the hospital and burial ground. Although no historic documents locate the precise area, the site is linked with this historic event, and City officials should consider the implication of affecting a Revolutionary War burial ground. A field review with Mr. Angelo Marino of the Milford Planning and Zoning Commission located "Pox Hill," which is found in the northeastern section of the




site, immediately east of the Hunting Club lodge. "Pox Hill" emerges on the border of the existing wetlands and has evidence of a stone well for drinking water for the patients. It is recommended that this area and the adjacent wetlands be preserved as open space or a historic preservation easement. The hill is approximately 1-acre in size and should be left undisturbed, especially if there is a possibility of encountering human skeletal remains.


A professional archaeological reconnaissance survey is strongly recommended for undisturbed portions of the proposed development site in order to locate and identify all prehistoric Indian and historic resources which might exist. All archaeological studies should be done 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 technical assistance to the City of Milford and the developer in an effort to identify and ensure the preservation and conservation of the cultural resources on the site.

In summary, the site is located in a critical area of importance to prehistoric Native American lifeways. Stone artifacts found during the field review indicate that an Indian encampment overlooking the Housatonic River was located on this site. Additional archaeological sites are predicted along the ridge. A Revolutionary War hospital and burying ground for British prisoners with smallpox also may exist on the site. Open space or historic preservation easements should be established to protect this burial ground. It is strongly recommended that all feasible efforts be undertaken to identify and ensure the preservation of these important historic resources.

Figure 8



-  Potential site for "Pox Hill"
-  Potential prehistoric sites
-  Indian village site

NORTH MILFORD VILLAGE
MILFORD, CONNECTICUT
King's Mark Environmental Review Team
Scale: 1" = 750' 

Information from USGS Topographic Maps, Milford Quadrangle

Archaeological Sites

LAND USE AND PLANNING CONSIDERATIONS



PLANNING CONSIDERATIONS

North Milford Village, a 419-unit residential development on 156 acres in western Milford, consists of both single-family clustered residences and a multi-family condominium development. The project requires that the Milford Planning & Zoning Commission approve a zone change and the site plans for the planned residential development (PRD) and design district condominiums. The Milford Inland Wetlands Commission must review any regulated activities associated with the project for approval.

Proposed Zone Change

The 156-acre tract is located in 2 zones. The western 51 acres are zoned Limited Industrial (LI-30). The remaining 105 acres are zoned Residential (R-30) for low density single-family development.

The applicant proposes a zone change from LI-30 to R-30 and Housatonic Design District (HDD). This proposed zone change to R-30 seems to be consistent with the City's Plan of Development recommendation that industrial land along the Housatonic River be rezoned for low density residential use. This recommendation takes into consideration the physical characteristics and restricted access to the site.

The proposed zone change from LI-30 to HDD, although not specifically addressed in the Plan, may be consistent with the goal which advocates the use of spatial arrangements such as clusters to protect the river corridor. However, the HDD zone is not exclusively for residential uses. Other permitted uses are select heavy industry and hotels/motels. A zone change from LI-30 to HDD does not guarantee the desired residential development. A zone change cannot be granted with restrictions limiting the use.

Compliance with Local Zoning Regulations

Under Section 5.8 of the local zoning regulations, a PRD is designed to:

- 1) Promote the most appropriate use of land at a population density compatible with the applicable zoning district;
- 2) Provide design flexibility by permitting a variety of single-family dwelling units;
- 3) Facilitate adequate design and economical provision of streets, utilities and other site improvements; and
- 4) Preserve natural resources through the maximum protection of woodlands, waterbodies, watercourses, steep slopes, scenic vistas, conservation areas, recreation areas and similar natural features, characteristics and open spaces.

An R-30 zone requires houses on a minimum of 30,000 square foot lots. A Special Permit for the PRD Zone provides that the single-family dwellings shall be developed at a sliding scale density between 1 unit per 12,500 square feet and 1 unit per 30,000 square feet on a 2-acre lot. Open space and natural features shall be permanently preserved. Standards are given for area and bulk requirements.

In addition to the maps and reports provided, the plans should include a basic list of site data. The list should analyze the regulatory criteria and the proposal. The list should include lot area, coverage, bulk, number of lots, minimum lot size, number of bedrooms, area of open space to be dedicated, regulated areas and areas subject to easements.

The HDD regulations are designed to permit appropriate development in the sensitive river corridor. These regulations define site development standards. These standards should be addressed in a basic list of site data.

Development Density and Housing Stock: Applying the density regulations of Section 5.8.4.3 to the proposed PRD, it appears that the proposed 419 units fall into the

middle range of the permitted densities. The proposed units include duplexes which do not appear to be a part of the PRD Zone.

Specifically, applying these standards to the 19.44 acres east of East Rutland Road, 28 to 67 single-family units are permitted. The plan proposes 36 structures on this tract, including some duplexes. Similarly, on the 86.09 acres west of East Rutland Road, 152 to 365 single-family units are permitted. The plan proposes 219 structures on this tract, also including some duplexes.

In the HDD zone, density is limited to 10 units per acre or 22 bedrooms per acre. Applying this standard to the 38.25 acre site, 382 units with 841 bedrooms are permitted. The project includes 190 units with 570 bedrooms, well below the maximum limits.

Building Design: The plan shows designs for a variety of basic housing types, including additive features such as dormers, porches, breezeways and bays. To provide some variety within the development, a commitment must be made to coordinate a diversity of architectural styles, materials and color throughout the project.

Open Space: A PRD, under section 5.8.4.7 must have no less than 30% of the total area retained as open space. The contribution by designated wetlands is factored at 50% of their total area.

On this 156-acre tract, using the minimum 30% factor, there should be a dedication of **at least** 46.8 acres. The 12 acres of wetlands factored at 50% contributes 6 acres, leaving a balance of 40.8 acres to be designated in the upland areas. This information should be listed in the table of project data.

In the HDD zone, the regulations state that at least 50% of the land is to be dedicated as permanent open space. On the 38.25 acre tract, at least 19.6 acres must be dedicated. Again, this information with details of the actual dedication should be listed in the site data table.

The local zoning regulations and Plan of Development state that the City plans to balance development with the preservation of natural features and desirable areas. The possibility of clusters and planned residential developments in place of traditional subdivisions shows the City's commitment to this philosophy.

In selecting areas for open space designation, it is highly desirable to protect regulated wetland areas because they serve valuable functions ranging from stormwater detention to wildlife habitat. However, these areas are very sensitive, and it is imperative to couple the protection of wetland areas with the preservation of useable upland areas.

While the total proposed dedication of some 45 acres is very generous, the City must evaluate the kind of land proposed to be dedicated and its configuration. Within the PRD, for example, most of the proposed open space is a somewhat steeply sloped area between the PRD and the primary connector road, East Rutland Road. This open space seems to be primarily a visual buffer, separating this development from surrounding development. Much of the remaining open space is designed as a "beltway" and central green, closely surrounded by trees, but dissected by various roads. A network of trails provides some additional relief.

Active recreation is limited to 2 areas. The first designated area provides tennis courts and a playing field. However, these facilities may not be adequate for a development of this size. The second designated area is the "clubhouse" in the HDD zone. Nestled into the trees, the clubhouse is a very positive factor in a development of this size. However, its quiet location must be weighed against its non-central location and the impacts it will have on the hill and the remaining wildlife habitat.

Considering the amount of open space dedication possible in a project of this size, steps must be taken to ensure that the site's unique values are permanently protected. Strict preservation covenants/easements which restrict activities ranging from recreation to clearing should be considered.

Wetland Impacts

Although the site has a very small amount of regulated wetland area, approximately 17 acres, the proposal does involve some intrusion into these areas for road and detention basin construction. At least a dozen residential units are proposed either within or extremely close to the boundaries of the regulated area.

Considering the small physical area of these regulated areas relative to the site, there should be no intrusions. The detention basins should be designed outside of the wetlands, eliminating any immediate impacts to these areas. No living units should intrude into these areas, avoiding unnecessary filling and the inevitable damaging effects of water on the structures.

Although there are no mitigation measures shown on the plans, during the field review, there was some discussion about restoring the wetland meadow by introducing stormwater runoff. A clear site-specific plan for this proposal must define the anticipated short-term and long-term advantages and disadvantages of this idea.

Traffic and Circulation

The proposed 419-unit complex is divided into 2 sections. The main section west of East Rutland Road with 383 units will be served by 2 primary access roads. The first access road will connect to East Rutland Road. The second access will connect with Oronoque Road. The remainder of the proposed development east of East Rutland Road will be served by a single access road connecting to Zion Hill Road.

These 3 roads, Zion Hill Road, East Rutland Road, and Oronoque Road, are narrow and curve awkwardly through this sparsely developed residential neighborhood. The site lines for the access roads are limited. Although no traffic estimates have been submitted, some experts suggest that the project could generate up to 3,400 vehicle trips daily. It is questionable whether the existing roads can safely accommodate this traffic increase.

Conclusion

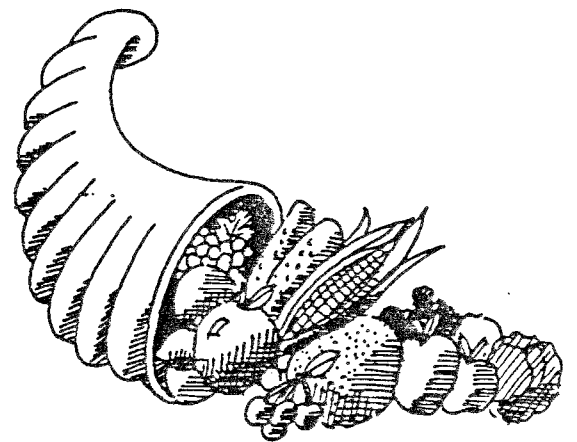
The proposed North Milford Village development appears to conform with some of the local zoning regulations. However, the dwelling density selected has no clear supporting data that this is the best density for the site. The PRD includes duplexes, while the regulation permits only single-family residences.

No definitive evidence is given to show that the limited access roads can safely and comfortably accommodate the traffic that will be generated by this proposed development. The open space dedication, while meeting the minimum area standards, falls short of the philosophy of "maximum protection" of select natural features.

In this proposal, much of the heavily wooded site will be cleared to make way for road and house construction. Although a wide "buffer strip" is proposed along Rutland Avenue, the plan shows that elsewhere on the property most of the natural vegetation will be removed. While a landscaped environment with lawns and ornamental plants is attractive to some people, it virtually eliminates the existing wildlife habitat. Do the new values of the proposed development offset the values of the existing habitat and associated species which will be lost?

Perhaps an alternative design could be drawn to retain more of the natural vegetation throughout the project. Ideally, areas of natural habitat should be designated and the proposed development molded to fit the landscape. Considering the size of the site and the level of development and preservation possible under the regulations, it is questionable that this proposal is the best among all alternatives.

APPENDICIES



Appendix A: Soil Limitations Chart

DRAINAGE CLASS & DEPTH TO SEASONAL HIGH WATER TABLE

DEVELOPMENT LIMITATIONS

MAP UNIT NAME	GENERAL SOIL PROPERTIES	HOMES WITH BASEMENTS	HOMES WITHOUT BASEMENTS	ROADS & STREETS	EXCAVATIONS
AFB - Agawam fine sandy loam, 3-8% slopes	Deep soils formed in a loamy mantle over sand and gravel that were derived from gneiss, schist and phyllite. Found on outwash terraces in stream valleys.	Slight	Slight	Slight	Severe - cut banks cave
CfB - Charlton fine sandy loam, 3-8% slopes	Deep soils formed in glacial till derived mainly from gneiss and schist. Found on broad hill tops, ridge tops and glacial till plains.	Slight	Slight	Slight	Slight
CfD - Charlton fine sandy loam, 15-25% slopes	Deep soils formed in glacial till derived mainly from gneiss and schist. Found on the sides of hills and ridges and at the foot slopes of steep hills that have been highly influenced by the underlying bedrock.	Severe - slope	Severe - slope	Severe - slope	Severe - slope
ChC - Charlton very stony fine sandy loam, 8-15% slopes	Deep soils formed in glacial till derived mainly from gneiss and schist. Found on the side slopes of hills and ridged and at the foot slopes of steep slopes where the relief is affected by the underlying bedrock.	Moderate - large stones	Moderate - large stones	Moderate - slope	Moderate - large stones, slope

DRAINAGE CLASS & DEPTH TO SEASONAL HIGH WATER TABLE

DEVELOPMENT LIMITATIONS

MAP UNIT NAME	GENERAL SOIL PROPERTIES	HOMES WITH BASEMENTS	HOMES WITHOUT BASEMENTS	ROADS & STREETS	EXCAVATIONS
---------------	-------------------------	----------------------	-------------------------	-----------------	-------------

HpE - Hollis-Charlton fine sandy loam, 15-35% slopes	Hollis part formed in a mantle of glacial till derived mainly from gneiss and schist. Charlton part formed in glacial till derived mainly from gneiss and schist. Found on upland sites where the relief is affected by the underlying bedrock.	Hollis: somewhat excessively drained Charlton: somewhat excessively drained >6.0 feet	Hollis: Severe - depth to bedrock, large stones Charlton: Severe - large stones	Hollis: Severe - depth to bedrock, large stones Charlton: Severe - Moderate - large stones	Hollis: Severe - depth to bedrock, large stones Charlton: Severe - large stones
--	---	--	--	---	--

Lc - Leicester fine sandy loam, 0-3% slopes	Formed in loamy glacial till that was derived mainly from gneiss and schist. Found in low lying wet depressions and in small drainageways of glacial uplands.	Poorly drained 0-0.5 feet	Severe - wetness frost action	Severe - wetness, frost action	Severe - wetness
---	---	------------------------------	----------------------------------	--------------------------------	------------------

Aa - Adrian and Palms muck, >1% slopes	Formed in organic material over sand, or sand and gravel that were derived mainly from gneiss, schist, sandstone and conglomerate. Found in low depressions and along small slowly moving streams on outwash terraces and glacial till plains.	Organic soil +1-0 feet	Severe - wetness, excess humus	Severe - wetness, frost action, excess humus	Severe - wetness, cutbanks cave, excess humus
--	--	---------------------------	--------------------------------	--	---

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 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.