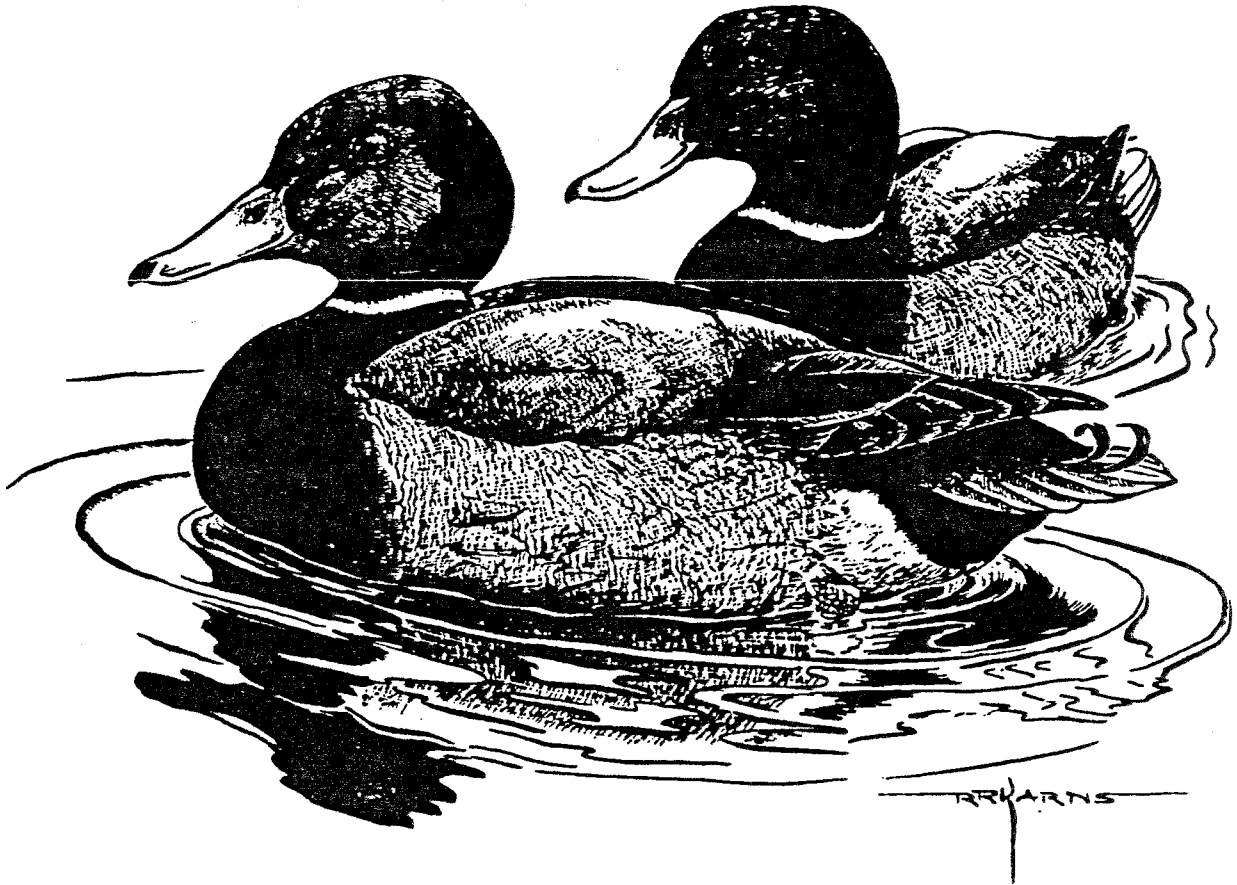


KING'S MARK ENVIRONMENTAL REVIEW TEAM



REPORT FOR
LAKE WINCHESTER SUBDIVISION
NORFOLK AND WINCHESTER,
CONNECTICUT

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

LAKE WINCHESTER SUBDIVISION
NORFOLK, WINCHESTER, 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

Norfolk Inland Wetlands and Planning and Zoning Commissions,

and

Winchester Inland Wetlands and Planning & Zoning Commissions

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 and Planning & Zoning Commissions and the Towns. The results of the Team action are oriented toward the development of a better environmental quality and long-term economics of the land use. The opinions contained herein are those of the individual Team members and do not necessarily represent the views of any regulatory agency with which they may be employed.

DECEMBER 1988

ACKNOWLEDGMENTS

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

- * William Warzecha, Hydrogeologist
Department of Environmental Protection - Natural Resource Center
- * Alan Page, Soil Conservationist
USDA - Soil Conservation Service
- * Daniel Mayer, Wetland Specialist
Department of Environmental Protection - Water Resources Unit
- * Charles Lee, Lake Specialist
Department of Environmental Protection - Water Compliance Unit
- * Richard Lynn, Planner
Litchfield Hills Council of Governments

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 Hartley Mead of the Norfolk Inland Wetlands Commission, Robin Mead of the Norfolk Planning & Zoning Commission, Pat Wass, Phil Hurlbut and David Cappabianca of the Winchester Inland Wetlands Commission, David Carter and R.E. Nalette of the Winchester Planning and Zoning Commission, Joanne Williams of the Town of Winchester, Scott Kauffman and Susan Newman of Time Equities, developer, Edward Ashburn and Barry Naderman of Kellard and Federico, engineer for the developer and Peter Herbst, attorney for the developer, for their cooperation and assistance during this environmental review.

EXECUTIVE SUMMARY

Introduction

The Norfolk Inland Wetlands and Planning and Zoning Commissions and the Winchester Inland Wetlands and Planning and Zoning Commissions have requested that an environmental review be conducted on Lake Winchester, a 468-acre site proposed for subdivision development. The site is located on the Norfolk/ Winchester Town line, west of Lake Winchester. The site contains second growth hardwood and hardwood/softwood forest with some open areas. Several wetlands run through the property and along the banks of Lake Winchester. Much of the site is steep and very rocky.

The proposed subdivision would encompass 65 house lots, ranging in size from 3.1 acres to 15.3 acres. An access road and two cul-de-sacs are proposed to serve the subdivision. The subdivision would rely upon on-site septic and water.

There was an ERT Report prepared for this site in 1984. A 132-acre parcel on the west side of the original development plan is no longer included in this proposal. The primary goal of this ERT is to update the existing data and provide planning and traffic/access information.

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

Topography

The main topographic feature of the site is Lake Winchester. The land slopes moderately steeply to very steeply towards the lake or Silas Hall Pond. There are a few isolated plateau areas. The topographic conditions are controlled by the underlying bedrock.

Geologic Development Concerns

Geologic limitations on the site include: (1) areas where bedrock is at or near the surface; (2) till soils with a hardpan layer; (3) lots with moderate to very steep slopes; and (4) areas of seasonal or permanent wetness. These will limit the ability to provide subsurface sewage disposal, areas for house foundations and buried utility lines and road and driveway placement. Because of unfavorable subsurface conditions, many of the building lots would be considered of "special concern" by the Department of Health. Special engineered design plans will be needed to overcome the limitations. Areas with hardpan soils may require curtain drains to lower the groundwater so it will not interfere with the septic systems functions. Prior to subdivision approval, each lot should be shown to meet the minimum soil standards set out in the public health code. It is suggested that this process be a joint effort

between the design engineer and the local health department. Systems should be properly designed and maintained. Lots 5-8 and parts of Lots 4 and 19 lie within a public water supply watershed. Any development in this area should follow the Sanitation of Watersheds section of the Public Health Code.

The presence of bedrock at shallow depths suggests that blasting will be required for driveways, foundations, roads and utility lines. All blasting should be done carefully and under the strict supervision of experienced personnel. A pre-blast survey might minimize the chance for damage claims.

Deep cuts into hardpan soils are difficult to stabilize due to seepage of water over the compact layer. Once the soil has begun to move, establishment of a vegetative cover is practically impossible.

Based on the plans, wetlands will be crossed in several areas. The road layout could be redesigned to minimize or eliminate crossings in some areas. The access road between Lots 17 and 19 could be shifted south. Wetland crossings are feasible provided they are properly designed. Detailed plans for all crossings should be provided. Approved activities in wetlands should be closely monitored by the Towns.

Wetland soils are regulated under Public Act 155. Any activity in the wetlands requires a permit from the Inland Wetlands Commissions.

Water Supply

The bedrock underlying the site consists of gneisses. Gneisses are coarse-grained banded rocks. Stress has created joints and fractures in the rocks through which water moves. The random nature of these fractures prevents accurate predictions of well yields on the site. Groundwater on most of the site is classified as GA. Groundwater on Lots 5-8 and parts of Lots 4 and 19 is classified as GAA.

Hydrology

Drainage from most of the site flows into Lake Winchester. Drainage from the northern 55 acres flows into the Mad River. Changes in land use are expected to increase runoff volume. Lake Winchester serves as a natural runoff detention area so post-development runoff should not pose any flooding problems. The engineer should submit a stormwater management plan to the Towns for review.

The stability of the dam on the Brasche property should be examined closely. If the dam is breached it could pose problems for egress and emergency vehicle access.

Because of the steep slopes, silty soils and excellent aquatic habitat, a thorough erosion and sediment control plan should be followed. The best method for control is keeping disturbed areas to a minimum. Maintenance of catch basins and roads is important.

Soil Resources

Two soil map units on the plans are not found in the Soil Survey of Litchfield County. The plans also contain different soils information than was provided by Roy Shook. These discrepancies should be addressed. The erosion and sediment control plan appears adequate for a conceptual subdivision. Some recommendations include using silt fence rather than hay bales, maintaining the silt fence within wetlands until all disturbance has been stabilized and providing complete and more detailed information as individual lots are developed. Proper installation and maintenance is necessary for all erosion and sediment control measures.

Water Quality

Lake Winchester is a Class A waterbody, which means its designated uses include fish and wildlife habitat and recreation. The lake is early-mesotrophic, however has somewhat more weed growth than the average. Lake Winchester is owned and managed by the DEP as a warmwater fishery, and the future residents should not expect the DEP to change their management practices to accommodate recreational uses such as swimming and boating. The proposed subdivision is 30% of the Lake Winchester watershed. A development that changes land use from woodland to residential is considered unfavorable from a water quality standpoint. Septic systems and lawn fertilizers could increase the rate of eutrophication in the lakes. Runoff from stormwater systems carries sand, silt and oil resulting in pollution. Careful design and maintenance of stormwater systems will be needed to protect Lake Winchester. Each Town should review the management plans carefully before approval. If the management responsibilities fall to a homeowners association, the Towns should insure that the plans are followed. If the responsibilities fall to the Towns, perhaps the special measures needed to protect the lake could be charged to the association.

The proximity of the lake makes erosion and sediment control during construction critical. Improper measures could result in areas of the lake filling in and high turbidity levels. Areas which are highly susceptible to erosion should be mapped to inform the developer and Towns the location of the areas that need the most protection.

The Declaration and Agreement is a progressive document but the enforcement of the agreement needs to be clear. Some suggestions include using natural color houses, easing the minimum house size, pumping septic tanks every two years, reducing the cleared acreages, restricting waste disposal areas, restricting the viewing corridors, limiting lawn fertilizers and adding tributaries in the restrictions for disturbance.

Wetland Considerations

The site contains approximately 70 acres of wetlands. There are five water courses crossing the site, two of which appear to flow most of the year. Wetland functions include drainage, wildlife habitat, recreation/education, fisheries, water

quality renovation and aesthetics. The highest quality wetlands are found on the shores of the lake where they provide transitional habitat.

The agreements for the homeowners association should reduce the secondary impacts from the development if they are properly enforced. The Commissions should develop a feasible plan for maintenance and enforcement.

The wetland impacts appear to be within acceptable limits. Due to the luxury of space on the lots, the Commissions should consider a minimum setback from the wetlands and watercourses and include this in the agreement. Six wetland crossings are proposed. Two are large and are designed for a 100-year storm event. The proposed common drive is an area of concern. Consideration might be given to box culverts or a small bridge for this crossing rather than the earthen berm. If the dam on the stream should breach, the crossing must be capable of passing the flows. An earthen berm poses the risk of washing out. Also the culvert or bridge would allow freedom of movement for wildlife. The viewing corridors might be reconsidered due to the visual impacts of a 50-foot clearcut on the lake.

Threatened and Endangered Plant and Animal Species

According to the DEP - Natural Diversity Database the area around Silas Hall Pond is a Natural Area Inventory site and is considered as a critical Connecticut habitat, level bog. There are also several "Species of Special Concern" and Monitored Species found in the area.

Planning Considerations

The site is zoned rural residential in Norfolk and RU-3 in Winchester. The surrounding land is also zoned for rural residential development. Surrounding land uses include undeveloped woodland, open fields and several residences. The Nature Conservancy owns a natural area to the north of the site. Under an agreement with the developers, an innovative land exchange will protect the natural area around Silas Hall Pond. The project appears to be compatible with existing and proposed land uses in the area provided environmentally sound engineering and construction practices are followed.

The State Policies Plan for the Conservation and Development of Connecticut, 1987-1992 identifies the area as "rural land." This designation allows development with on-site water and septic systems and is consistent with the rural character of the adjacent areas. The project appears to be consistent with the state plan, the Litchfield Hills CEO preliminary housing policy and the zoning regulations of the Towns.

Design Considerations

Comments on the design include providing solar orientation of homes on the southerly slopes, reserving additional land on the lake shore for public use and working with the Commissions on the enforcement of the restrictive agreements.

Traffic Considerations

The proposed development may need a certificate from the State Traffic Commission. The STC will review the road system and traffic patterns to ensure the project will not pose a safety hazard. Based on a preliminary review, the road system appears adequate, following the contours of the property. Several steep slopes are encountered and care must be taken not to exceed the maximum grades.

The common drive access to Lots 59-65 should be carefully scrutinized. Of concern is the lack of alternative or emergency access. It is suggested that the Commissions consult with emergency services personnel to learn the requirements of the response vehicles.

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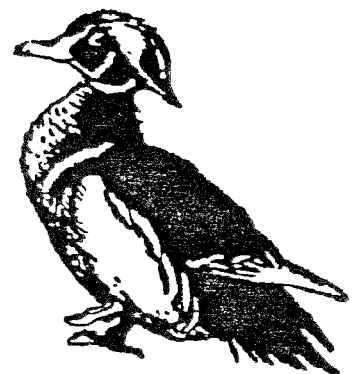
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INTRODUCTION



INTRODUCTION

The Norfolk Inland Wetlands Commission and Planning and Zoning Commission and the Winchester Inland Wetlands Commission and Planning and Zoning Commission have requested that an environmental review be conducted on Lake Winchester, a 468-acre site proposed for subdivision development. The site is located on the Norfolk/Winchester Town line, west of Lake Winchester. Access is provided from Winchester Road in Norfolk and Grantville Road in Winchester.

The site contains second growth hardwood and hardwood/softwood forest with some open areas. Several wetlands run through the property and along the banks of Lake Winchester. Much of the site is steep and very rocky.

The proposed subdivision would encompass 65 house lots, ranging in size from 3.1 acres to 15.3 acres. An access road and two cul-de-sacs are proposed to serve the subdivision. The subdivision would rely upon on-site septic and water.

There was an ERT Report prepared for this site in 1984 (see Appendix A). A 132-acre parcel on the west side of the original development plan is no longer included in this proposal. The primary goal of this ERT is to update the existing data and provide planning and traffic/access information. Specific objectives include:

- 1) Assess the hydrological and geological characteristics of the site, including geological development limitations and opportunities;
- 2) Determine the suitability of existing soils to support the proposed development;
- 3) Discuss soil erosion and sedimentation concerns;
- 4) Assess the impact of the development on the wetlands;
- 5) Assess the impact of the development on Lake Winchester;
- 6) Evaluate traffic and access concerns; and
- 7) Assess planning and land use issues.

THE ERT PROCESS

Through the efforts of the Norfolk and Winchester Inland Wetlands and Planning and Zoning Commissions, the developer's representative and the King's Mark ERT, this environmental review and report was prepared for the Town. This report primarily provides a description of on-site natural resources, and presents planning and land use guidelines.

The review process consisted of four 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 October 26, 1988. 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, it was then necessary 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

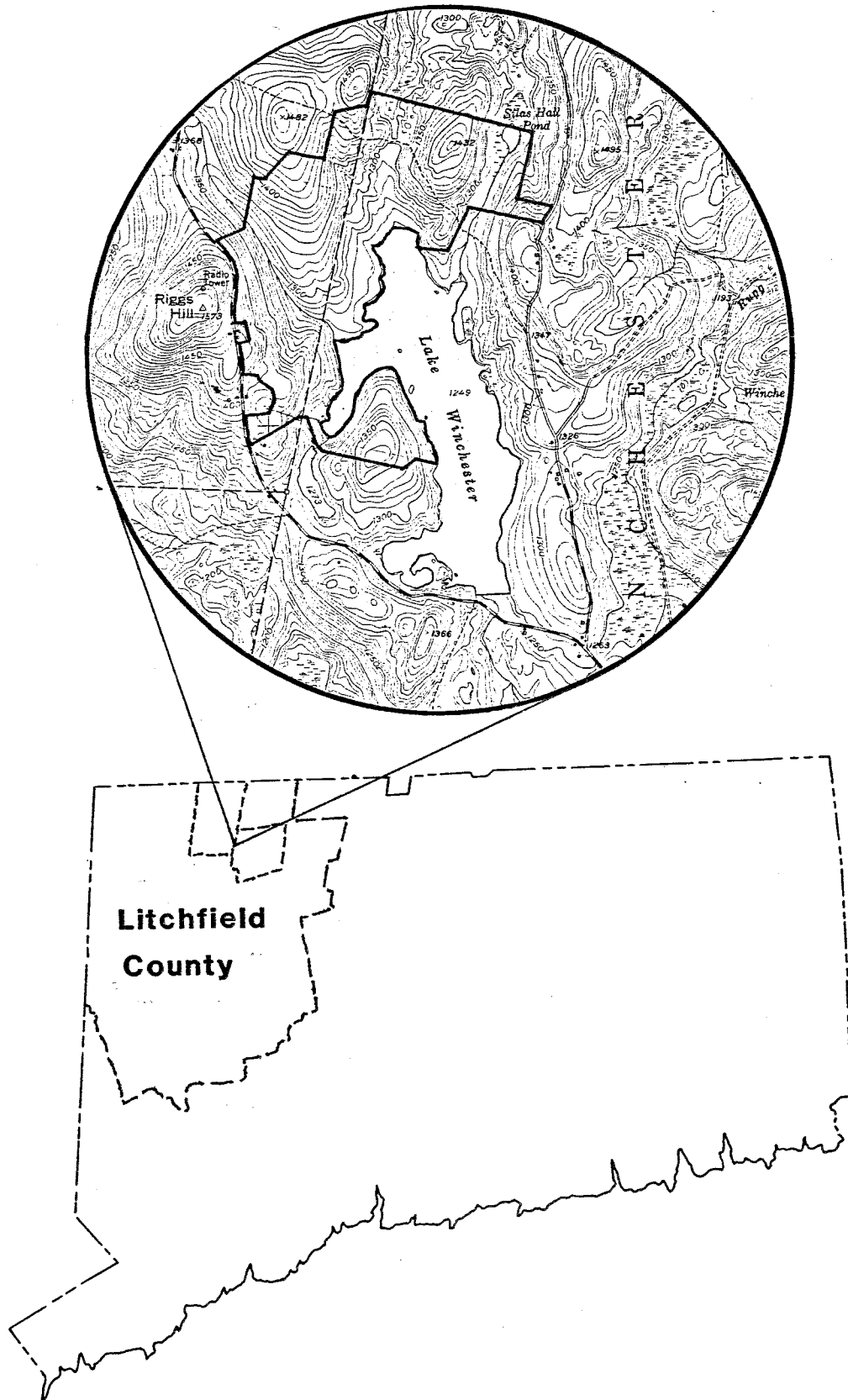
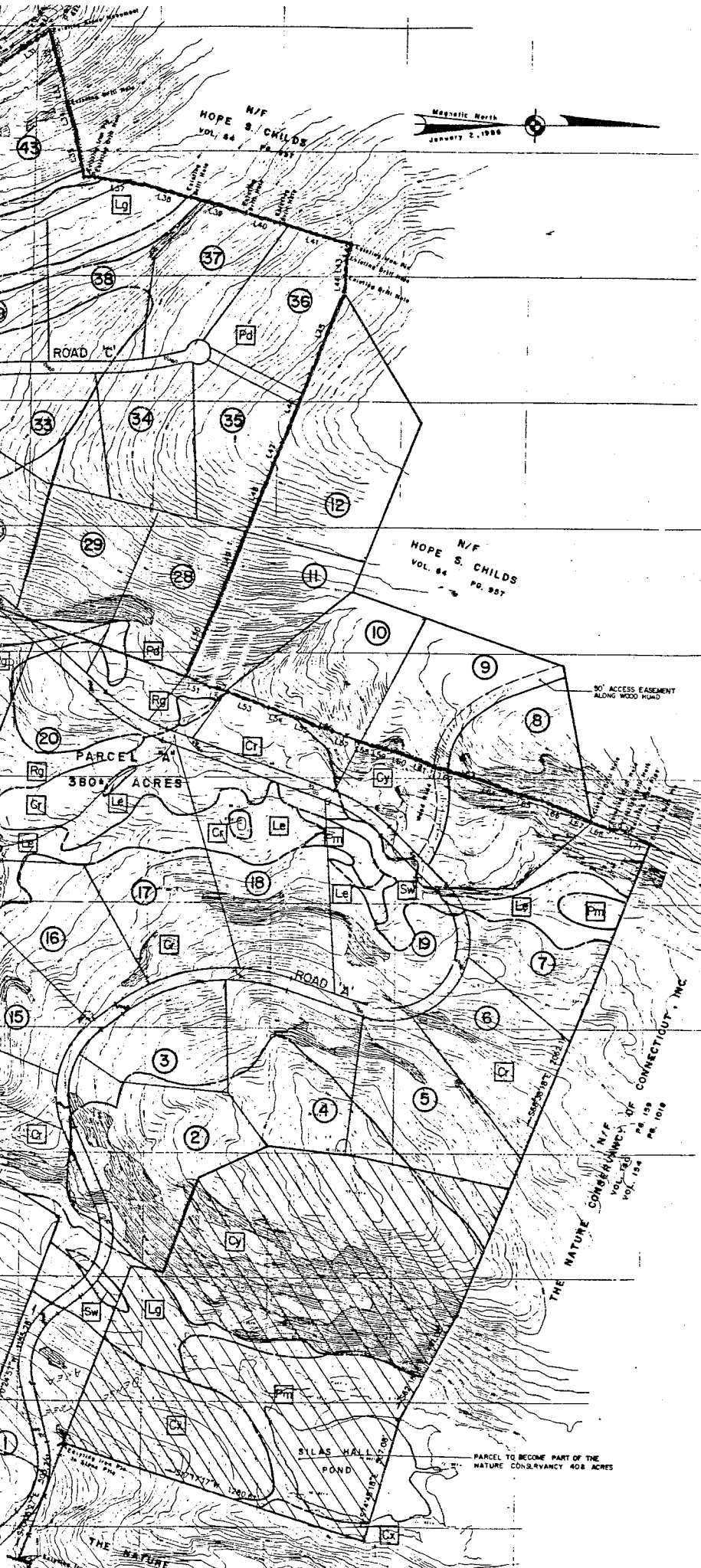


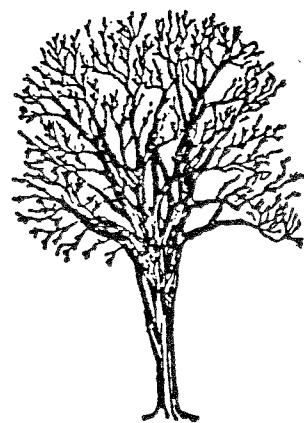
Figure 2



Information from Kellard & Federico
Subdivision Plan

<p>LAKE WINCHESTER SUBDIVISION</p> <p>NORFOLK, WINCHESTER, CONNECTICUT</p>
<p>King's Mark Environmental Review Team</p>
<p>Scale: 1" = 600'</p>
<p>Proposed Site Plan</p>

PHYSICAL CHARACTERISTICS

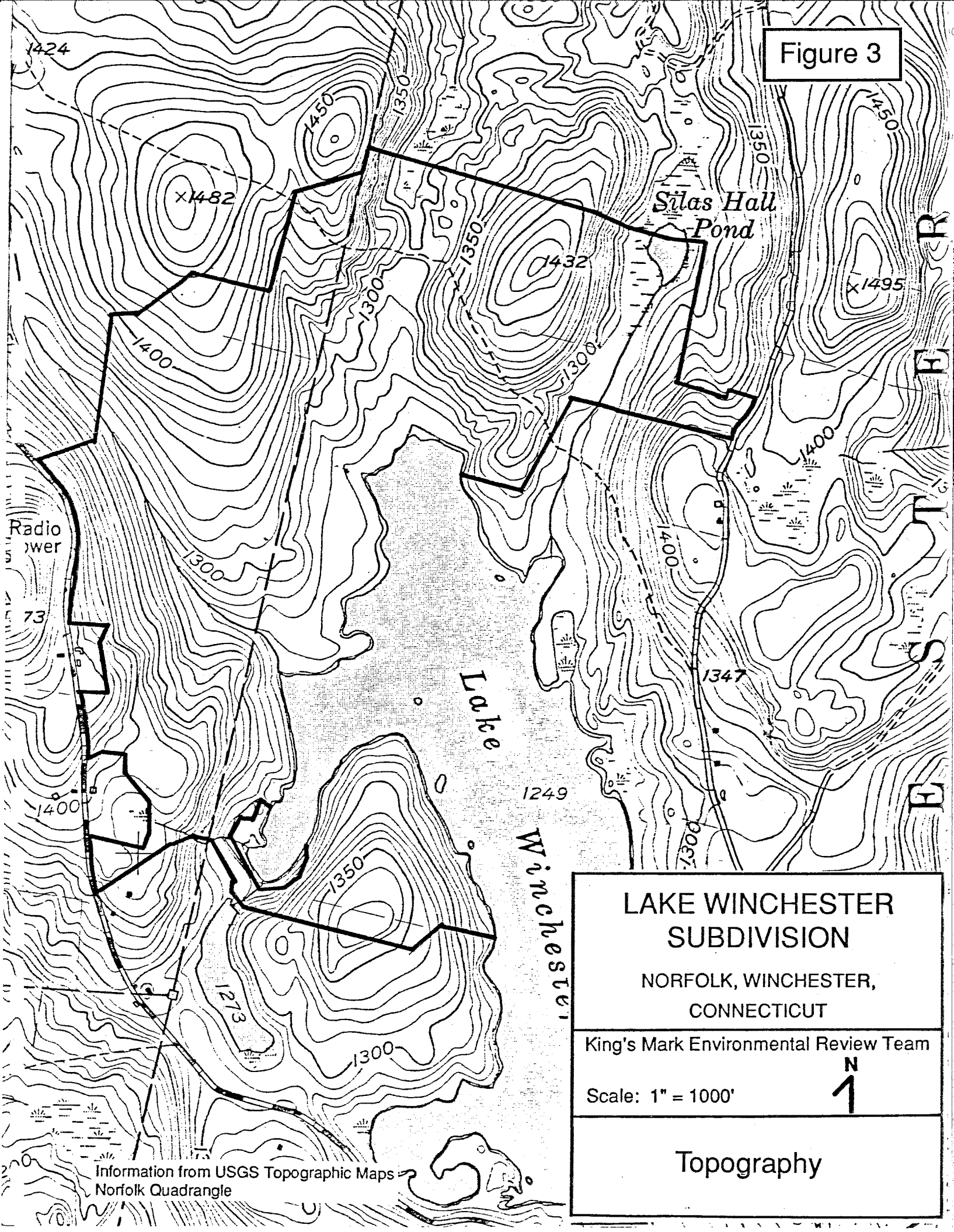


moderately steep to very steep slopes; and (4) areas of seasonal and permanent wetness. While these hydrogeologic limitations will weigh heaviest on the ability to provide adequate subsurface sewage disposal systems, they may also pose a potential concern in terms of house foundations, the installation of buried utility lines and road and driveway construction.

A review of available soil testing and mapping data suggests that the majority of lots are suitable for sewage disposal, but that unfavorable subsurface conditions (i.e., shallow bedrock and seasonably high ground-water tables) prevail on many building lots. As a result, it is likely that most lots would be deemed severe and of "special concern" by the State Public Health Code relative to the installation of subsurface sewage disposal systems. As a result, plans for the design of the subsurface sewage disposal facilities (along with the placement of each on site well water supply) must be prepared by a professional engineer and submitted to each health department for review and approval by their certified staff. This process should be a coordinated effort between the design engineer and the Torrington Valley Health District and Norfolk's sanitarian.

Design recommendations suggested by the project engineer and Health District for the hydrogeologic limitations mentioned earlier include raised septic systems with specified bank run gravel and/or the installation of curtain drains. The construction of septic systems in fill material should proceed very carefully and in strict compliance with the State Public Health Code and Technical Standards. The main concern is to ensure that the surrounding naturally occurring soils can adequately absorb or disperse the expected volume of sewage effluent without overflow, breakout or detrimental effect on ground or surface water. Only fill material as prescribed in Technical Standards should be used. Additionally, the fill material must be properly compacted.

Figure 3



**LAKE WINCHESTER
SUBDIVISION**

NORFOLK, WINCHESTER,
CONNECTICUT

King's Mark Environmental Review Team

Scale: 1" = 1000'



Topography

Information from USGS Topographic Maps
Norfolk Quadrangle

for damage claims. Every effort should be made to complete the necessary blasting prior to house construction.

Deep cuts, (i.e., roads, driveways, etc.) into soils with compact zones are extremely difficult to stabilize due to seepage of groundwater over the compact zone (hardpan layer). The water creates an unstable condition just below the seepage line. The weight of the unstable soil causes the soil to move downslope. After this begins, the slope is extremely difficult to stabilize. The establishment of a good vegetative cover is practically impossible on these eroding slopes.

Based on a subdivision plan submitted to team members, the present interior road system will need to cross or impact wetland areas in several areas. The road layout could be re-designed to minimize and/or eliminate anticipated wetland crossings in some areas. For example, the access road between Lots 17 and 19 might be shifted southward, minimizing wetland disturbances in the area.

Wetland crossings are generally feasible provided they are properly designed (e.g., culverts are properly sized and installed and permeable road base fill material is used). The roads should be constructed at least 1.5 feet and preferably 2 feet above the surface elevation of the wetlands. This will allow for better drainage and decrease the frost heaving potential of the roads. It is recommended that any road construction through wetland areas be done during the dry time of the year with adequate provisions for effective erosion and sediment control. All organic material should be removed and replaced with a permeable road base material. The subdivision plan should indicate specific site development details, erosion and sediment control measures, fill lines, amount of fill to be placed, the impacts of filling, watercourse channel location and flow directions, disturbed areas, etc. This information will greatly benefit land use decision makers in both Towns.

Because these soils are classified as inland-wetland soils in Connecticut, they are regulated under Public Act 155. Any activity which involves modification, filling

or removal of soil, etc., will require a permit and ultimate approval by both Towns' Inland Wetland Commissions. In reviewing a proposal, the Commissions need to determine the impact that the proposed activity will have on the wetlands. If the Commissions 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.

WATER SUPPLY

According to the "Bedrock Geologic Map of the Norfolk Quadrangle, Connecticut" (Harwood, 1979), which encompasses the subject site, the entire parcel is underlain by crystalline bedrock consisting of metamorphic rocks (gneisses). In general, the gneisses are a coarse-grained rock type, characterized by the relatively parallel orientation of mineral grains with massive to platy appearance. Alternating layers of light and dark minerals give the rock a banded appearance. Gneissic rocks respond to geologic stresses within the earth's crust by fracturing and forming open joints or seams. Water moves largely in the joints and fractures that generally occur in the upper few hundred feet of the bedrock surface. The random nature of the fractures and seams prevent prediction of well yields in bedrock except on a statistical basis. For this reason, it is extremely difficult to predict the yield of a bedrock well prior to drilling. (Interested persons should refer to the 1984 ERT report for statistical information that pertains to bedrock wells in the Lake Winchester area.)

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

Groundwater beneath Lots 5-8 and portions of Lots 4 and 19 in the northern parts is classified as GAA. This means the groundwater lies within public water supply watershed and is presumed to be suitable for direct human consumption.

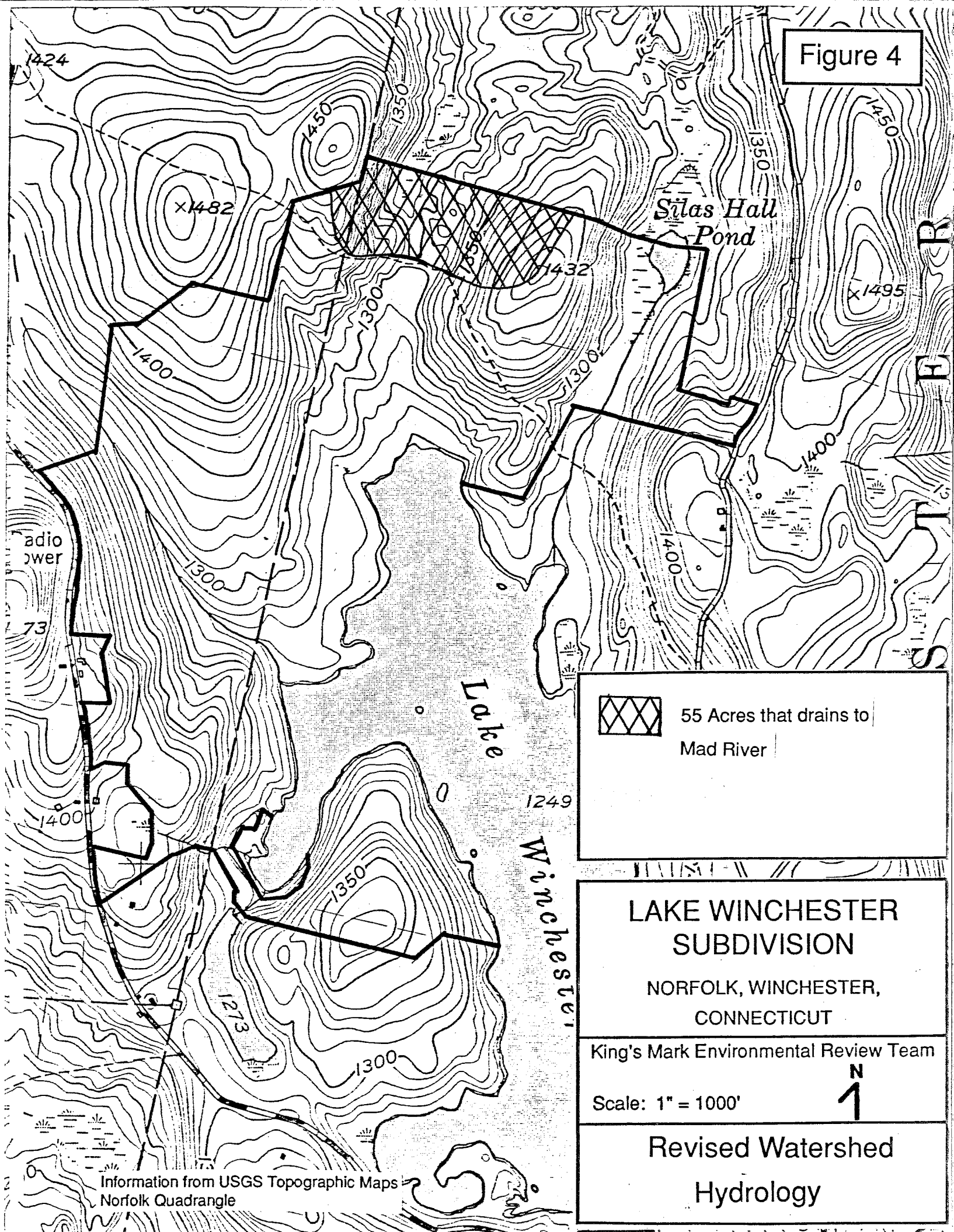
HYDROLOGY

The proposed subdivision calls for the development of 65 residential building lots, which would be served by on-site subsurface sewage disposal systems and individual water supply wells. The main access road will extend through the site from Winchester Road to Grantville Road. Present plans call for two cul-de-sacs off the main road.

The existing drainage pattern of the site was described in the 1984 ERT report. It should be noted that there is an error in the watershed boundary in the 1984 ERT report. The watershed boundary delineated in the report does not take into account the approximately 55 acres in the northern limits, which lies in the Mad River watershed. This area includes Lots 5-8 and parts of Lots 4 and 19. The remainder of the site drains to Lake Winchester.

The changes in land use on the site are expected to cause increases in runoff volume. These increases will arise mainly from the creation of impervious surfaces such as rooftops, paved driveways and roads, etc. Because of the site's close proximity to Lake Winchester, which serves as natural runoff detention area, the affects of post-development runoff should not be a problem from a flooding standpoint. Nevertheless, as a matter of policy the applicant's engineer should supply the Town with a stormwater management plan that includes hydrologic calculations and that is in adherence with Connecticut's "Guideline for Soil Erosion and Sediment Control."

Figure 4



55 Acres that drains to
Mad River

LAKE WINCHESTER SUBDIVISION

NORFOLK, WINCHESTER,
CONNECTICUT

King's Mark Environmental Review Team

Scale: 1" = 1000'



Revised Watershed
Hydrology

Information from USGS Topographic Maps
Norfolk Quadrangle

SOIL RESOURCES

The soils information and management recommendations provided in the 1984 ERT report for this subdivision are basically relevant today. However, the acreage information for each soil type provided in 1984 is no longer applicable due to the reduction in size of this project. No attempt was made to provide new acreage information in this report.

Soil Description

Two soils map units, Cy and Cx, are noted on the subdivision plan dated 7/25/88. These units do not exist within the Soil Survey of Litchfield County, CT. A soils legend directly on the plan will help to address this discrepancy.

The plan also contains different and more detailed soil information than was noted in a report by Roy Shook of Environmental Resources Associates. Mr. Shook stated in his report that "the non-wetland soils were not studied in detail." This discrepancy should also be addressed.

Erosion and Sediment Control

Considering the conceptual nature of this phase of the proposed subdivision, basically the erosion and sediment (E&S) control plan is adequate. The following recommendations will assist in providing a more efficient E&S plan:

- 1) Wetlands:
 - a) Use silt fencing, rather than haybales, as the primary sediment barrier adjacent to and within wetlands. Silt fences last longer and are stronger than hay.
 - b) Retain and maintain silt fences adjacent to and within wetlands until all construction activities in these areas are completed and the disturbance has been stabilized.
 - c) Include silt fencing on the north side of the proposed road through the wetlands in Lot 27.

- 2) The recommended seeding dates for establishing permanent vegetation are:
April 15 through June 15.
August 15 through September 15.
- 3) As individual lots are developed in the future, complete and more detailed E&S plans should be provided for proper analysis.
- 4) The key to successful E&S control is proper installation and maintenance.

Summary

The soils information and management recommendations provided in 1984, combined with updated information in 1988, provides adequate guidance for this planning phase of Lake Winchester Subdivision. If the recommendations and the erosion and sediment control plan are correctly followed, this subdivision should not have an adverse impact on the environment.

WATER QUALITY

Lake Winchester is a 229-acre lake with a maximum depth of 16 feet, and a mean depth of 13 feet. The lake was formed by damming the existing stream which forms the headwaters for the East Branch of the Naugatuck River. Lake Winchester and its tributaries are Class A waterbodies. Class A means that the designated uses are fish and wildlife habitat and recreational use. The lake and its tributaries are not suitable for discharges of treated wastewater.

In June 1988, Lake Management Consultants, Inc. sampled Lake Winchester to determine the nutrient concentrations. These data indicated the lake is early-mesotrophic according to the criteria of the Connecticut Agricultural Experiment Station.

A lake that is early-mesotrophic usually is clear with little weed or algae growth. However, Lake Winchester appears to be more productive than most lakes

in this category. This may be due to a rapid uptake of plant nutrients by the aquatic weeds stripping the water column of plant nutrients.

Prospective property owners should be made aware that Lake Winchester may not meet some of their recreational needs. The water may have a tea color tint and weeds can be abundant. Lake Winchester is managed and owned by DEP and serves as a warm water fishery, which is DEP's management objectives. If these natural conditions impair other recreational uses such as swimming and boating, residents should not expect DEP to change the present management objectives.

The proposed subdivision composes 417-acres of the 1395.2-acre Lake Winchester drainage basin, or 30% of the total watershed. A development that changes land use from wooded to residential is considered unfavorable when water quality is an issue. Septic systems, fertilizers, and other nutrient sources from residential areas increase phosphorous loading in receiving waterbodies which augments plant productivity (eutrophication). Runoff from stormwater sewers carries sand, silt, salt and oil into a body of water resulting in the pollutioning of many urban ponds.

Stormwater runoff from paved surfaces is a major source of pollution to urban lakes. Careful design and proper maintenance of stormwater drainage structures and adjacent roads is the key to minimizing impacts from stormwater runoff. Stormwater drainage systems that are designed to protect a lake may include detention ponds, filtering wetlands, groundwater infiltration, double chamber catch basins and buffer zones. Each town should review this section of the development carefully before final approval is granted.

If the Lake Winchester Subdivision forms a homeowners' association, maintenance of the drainage system and the roads can be part of their management plan. If these responsibilities are entirely the association's, the towns should assure that the plan is followed. If the Towns are responsible for maintenance perhaps the extra measures needed to protect the lake could be charged to the association. An

effective plan will include regularly scheduled street sweeping, cleaning of catch basins and detention ponds, leaf pickup, using chipseal instead of oil and lower concentrations of de-icing chemicals.

Public Act 83-388 designates authority to municipalities to enforce soil erosion control regulations through Inland Wetland Commissions. Strict continuous enforcement of these regulations by the towns during construction of the subdivision is essential to protecting Lake Winchester.

Soil erosion from poorly managed construction activities have filled in sections of many lakes. Although construction is short in duration, disturbed and exposed soils are highly susceptible to erosion. The filled areas become suitable habitat for aquatic weeds by increasing littoral zone size and providing a nutrient rich substrate.

Turbidity levels will increase if particulate size is sufficiently small. Small particles or colloids do not settle as quickly as larger particles such as sand. These fine particulates will remain suspended in the water column resulting in higher than background turbidity readings. This may be detrimental to aquatic organism such as fish and zooplankton.

The Inland Wetland Commissions should be aware that lots abutting the lake or its tributaries, and lots with slopes greater than 15% may require additional soil protection. In order to assure that critical areas are protected, the Wetland Commissions could request Time Equities to develop a map which would depict lots with these characteristics. This will serve to inform both the Wetlands Commissions and the developer of the location of these erosion prone areas.

The declaration and agreement contract (see Appendix C) is progressive from a development prospective but enforcement of the agreement needs to be clear among the developer and the Towns. If a real estate management company does not oversee the subdivision, the town will be responsible for enforcement. Usually towns do not

have the staff to give extra attention to a particular residential area. This scenario could lead to no enforcement of the agreement.

Particular segments of the contract which could be changed to prevent future lake management problems are as follows:

- 1) Land Use Control: Natural color houses such as shades of brown, blue and green should be considered. This will give Lake Winchester the appearance of being undeveloped.

The restrictions of 2,000 square feet minimum should be reconsidered. Smaller homes require less disruption of vegetation and soil which decreases the potential of soil erosion.

Septic systems should be pumped once every two years.

- 2) Clearing of Lots: Cleared land usually adds more phosphorous to a waterbody than land covered by natural vegetation. The following table shows the percent of the watershed which will be cleared giving various acreage restrictions.

4 acres cleared per lot (Present agreement)	= 19%
3 acres cleared per lot	= 14%
2 acres cleared per lot	= 9%
1 acre cleared per lot	= 5%

The contract should state whether the viewing corridor is included as part of the cleared acreage.

Animal waste can also lead to water quality problems. If horses are allowed, restrictions governing the management of manure and barn waste should be addressed in the agreement.

The section restricting waste disposal should also include yard debris and animal waste.

- 3) Lake Front Lots: The buffer zone of 50 feet should specifically state that ground cover of decaying leaves, grasses and shrubs should not be disturbed. A manual to establish standards of correct forestry practices should be referenced. The DEP Bureau of Forestry can recommend such a manual. The buffer zone concept should be expanded to protect the tributaries of the lake.

A viewing corridor of 50 feet may be difficult to enforce and will lessen the effectiveness of the buffers strip. Lake Winchester is unique for a Connecticut lake because the shoreline is undeveloped. A viewing corridor would decrease the aesthetic value of the lake. If the corridor is allowed the approved species of ground cover should be listed.

The paragraph which starts "between 50 feet and 200 feet" should read as follows: Between 50 feet and 200 feet landward of the lake and its tributaries.

The restriction of fertilized lawns should be expanded to include all lots and random use of pesticides. If fertilization of lawns is permitted, soil analysis on each lawn should be conducted to determine the ratio of phosphorous to nitrogen to potassium needed for the intended use.

The paragraph which starts "No house should be built closer than 150 feet to the lake," should read as follows: No house should be built closer than 150 feet to the lake and its tributaries.

Restrictive agreements can be a valuable tool for managing development in lake watersheds. A fine example of this is Woodridge Lake just 10 miles south of Lake Winchester, where homeowners have enjoyed increased property values due to the adequate management of the lakes watershed.

Property owners should also realize their property ends at the lake front and any activity (i.e. placement of sand, dock installation, or water level manipulation) requires prior approval from DEP, local Inland Wetland Commissions and other possible private parties.

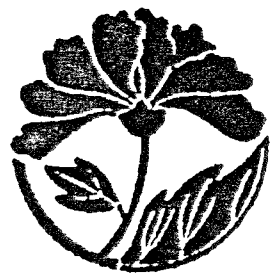
REFERENCES

DEP Water Compliance 1987
Water Quality Standards

DEP Water Compliance 1988
A Watershed Management Guide for CT Lakes

W.A. Norvell, C.R. Frink 1975
Water Chemistry and Fertility of
Twenty-Three Connecticut Lakes
Connecticut Agriculture Experiment Station
Bulletin 759

BIOLOGICAL RESOURCES



WETLAND CONSIDERATIONS

Wetland/Watercourse Description and Classification

The site under review contains approximately 70 acres of wetlands and watercourses, excluding the surface area of Lake Winchester. The majority of these wetland areas are classified as either Leicester (Le), Ridgebury (Rg) or Whitman (Wp) soil types, or a complex (Lg) of the three. In addition to these areas, there are several small areas of peat and muck soils (Lots 7, 18 and 19). There are approximately five watercourses of significant size which cross the site and drain into Lake Winchester. Two of the five watercourses appear to flow for the majority of the year (9-12 months), while the other three appear to be carry seasonal flows and runoff from storm events. The two streams with persistent flow are located at the south end of the property, crossing the common drive area for Lots 59-65, and at the eastern side of the site, crossing Lots 27, 38-42 and 55. All of the wetlands and watercourses contained on the site are classified as one of the following by the National Wetlands Inventory, prepared by the U.S. Fish and Wildlife Service.

- PFO4E - Palustrine, forested, needle-leaved evergreen, seasonally saturated.
- PFO1/4E - Palustrine, forested, broad-leaved deciduous, needle-leaved evergreen, seasonally saturated.
- PFO1E - Palustrine, forested, broad-leaved deciduous, seasonally saturated.
- LIOWHh - Lacustrine, limnetic, open water (bottom unknown), permanent, diked/impounded.

Wetland Functions

The most obvious function of these wetland areas is the conveyance of water from groundwater seepage and stormwater runoff. In performing this function

these wetlands and watercourses serve as a natural flood control and water storage system. Inherent in performing these functions are other functional benefits such as wildlife habitat, recreation/education, fisheries, water quality renovation and aesthetics.

The wetland areas of highest quality exist adjacent to the lake where they incorporate large transitional areas between the upland and open water environments. These areas are the most diverse and biologically productive with respect to both plants and animals. The public access ramp at the south end of the lake greatly enhances the recreational, educational and aesthetic functions of the wetlands on the lake shore.

Development Impacts

The proposal contains 65 house lots ranging from 3.1 to 15.3 acres in size, two cul-de-sacs, and a roadway which runs from Winchester Road, off the southwest corner of the site, to Grantville Road in the northeast corner of the site. As proposed, all of the lots and roadways will be owned and maintained by an association of future home owners within the subdivision. This association and the individual home owners would be subject to a declaration and agreement regarding land use controls, lot clearing and lake front management. Included in this land use agreement, or deed restriction, are several policies which will greatly reduce the potential for or secondary impacts from the development, if they are effectively enforced. The commissions should be careful to develop a workable and feasible plan for maintenance and enforcement by the association and have some means of guarding against neglect or violations by the association itself.

With respect to road construction, the wetland impacts appear to be within acceptable limits. The applicant has attempted to keep crossings and fillings to a minimum while still working with other site constraints such as slope. Due to the large size of all of the lots within the subdivision, it appears that few, if any, driveway

crossings will be needed to access the lot interiors from the main roads. The only lots which may need to propose some future wetland crossing are Lots 26, 27 and 48. Due to this luxury of space on all the lots, the wetlands commission should consider requesting that minimum setbacks or buffers from wetlands areas and watercourses be delineated and included in the declaration or land use agreement.

There are six separate roadway wetland and/or watercourse crossings proposed which will result in less than one acre of wetland excavation and fill (approximately 35,000 sq. ft.). Two of these crossings involve relatively large watercourses and are designed for a 100-year storm event. As reviewed by DEP staff, these crossings appear to be adequately sized. Information regarding the anticipated flow velocities should be supplied so that an adequate evaluation of the proposed outlet structures and preferred culvert sizing can be performed.

Another area of concern is the proposed common drive which would serve Lots 59-65. During the field review, the applicant's engineers indicated that this crossing would be served by an earthen berm with one or two culverts for the passage of water flows. The watercourse originates from a pond roughly 500 feet south of this finger of Lake Winchester. This pond was man-made and has a dam roughly 200 feet upstream from the proposed crossing. Due to the potential danger which exists if the dam were to breach, the proposed access drive should cross this watercourse with two box culverts or a small bridge. If the dam were to breach at some future time, the driveway crossing must be capable of passing the resulting flows. An earthen structure containing pipes may not be adequate for the passing of the flows, and risk washing out. Such a scenario would leave the seven lots without access and stranded from emergency vehicles and assistance. Additionally, box culverts or a bridge would create less of a barrier and allow for greater freedom of movement for wildlife in the area.

The Town Commissions should carefully consider the potential for impacts to the aesthetic quality of the lake from the proposed provision for fifty foot viewing corridors on all lake front lots. Lake Winchester is unique in that it is a state owned public access lake which has not experienced any lake side development. The proposed viewing corridors might effectively eliminate some of the benefits gained by the proposed house site setbacks. If fully used, this provision would allow for 22 clear-cut swatches to be created around the entire northwest portion of the lake. Though this may seem to be a relatively minor impact when compared to aesthetic impacts which have occurred on other lakes, it would be very significant in this case since the opportunity to allow for development, while still maintaining the pristine visual quality of this lake, is attainable. Additionally, the applicant's claim that this provision is needed to improve the marketability of the lots is weak, since the existing beauty and private character of the site cannot be improved by any additional clearing of the land. The site and its proposed lots possess sufficient value and quality in their present condition to market and sell themselves without any further landscape modifications.

Comments and Recommendations

- 1) The Town Commissions should use caution in the review and approval of the common drive crossing of the wetlands. Factors which the Commissions may want to consider include: (1) the passage of water flows from storm events and a potential dam breach event; (2) maintaining a wildlife corridor along the watercourse; (3) roadway and crossing maintenance by the lot owners or the association; and (4) what liability could the Towns have if the dam breaches and the homes cannot be reached by emergency vehicles?
- 2) Due to a luxury of open and buildable space available on all of the proposed lots, the Inland Wetlands Commissions may want to consider establishing a minimum setback limit to be placed within the proposed declaration (land use agreement). A set back provision would contribute toward the maintenance of the wetland and watercourse functions existing on-site and prevent any unnecessary wetland disturbances from property owners. Maintaining the highest quality wetland areas possible is crucial to the maintenance of water quality within Lake Winchester.

- 3) With regard to future permits for driveway crossings, the Inland Wetlands Commissions may want to designate driveway locations on those lots where access could result in wetland impacts. Predesignation, prior to the sale of the lot will reduce permit processing time and the potential for wetland impacts.
- 4) The applicant should be asked to supply information on the expected flow velocities from at the discharge points of the stormwater management system. This information will assist in the review of the adequacy of the proposed outlet structures and the potential for erosion within watercourses.
- 5) The proposed 50 foot viewing corridors for lake front lots present a significant potential for impacts to the aesthetic character and integrity of Lake Winchester. The Commissions may want to consider either eliminating or developing alternatives to the clear cutting approach proposed by the applicant. The elimination of this provision should neither reduce the value of the lots nor their marketability and will help preserve the visual resources of the lake.
- 6) The Inland Wetlands Commissions may want to include within the permit conditions some form of checks and balances to ensure that the maintenance and enforcement of the land use agreement by the association is upheld and binding. Assistance from the Towns' legal counsel, or some other legal source, should be consulted to ensure that the provisions of the agreement between the Towns and the association are mutually understood and functional.

In conclusion, the proposed plan for the Lake Winchester Subdivision should be within acceptable limits of impacts if the issues presented within this report are adequately addressed and resolved to the satisfaction of the local commission.

THREATENED AND ENDANGERED PLANT AND ANIMAL SPECIES

The Natural Diversity Data Base records indicate that the area immediately surrounding Silas Hall Pond is a Natural Area Inventory site, and is a critical Connecticut habitat, namely a level bog. In addition the existence of several populations of Species of Special Concern and Monitored Species has been documented.

In 1972 the Connecticut Forest and Park Association, Inc. prepared a Natural Area Inventory which included 459 sites. These were nominated as significant sites for one or more of the following attributes: geologic, hydrogeologic, biologic, archaeologic, cultural, aesthetic, research/educational. A site receives no legal protection by being included on the Natural Areas Inventory list.

Species of Special Concern (SSC) are species that occur in small or reduced numbers throughout the state based on comparisons to their historic distributions or species that are currently undergoing a non-cyclic decline. Major factors influencing a species status/abundance include: habitat destruction or degradation, pollution and collection.

Monitored Species (MS) are species not on the Species of Special Concern lists, but whose populations are being monitored state-wide.

<u>Species</u>	<u>Status</u>	<u>Last Observed</u>
<u>Rhododendron maximum</u> (Great Rhododendron)	SSC	1988
<u>Picea rubens</u> (Red Spruce)	SSC	1986
<u>Gomphus furcifer</u>	MS - invertebrates	1986
<u>Leucorhina hudsonia</u>	MS - invertebrates	1985
<u>Dorocordulia liberia</u>	MS - invertebrates	1985

Natural Diversity Data Base information includes all information regarding critical biologic resources available to us at the time of the request. This information is a compilation of data collected over the years by the Natural Resources Center's Geological and Natural History Survey and cooperating units of DEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. 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. Such new information is incorporated into the Data Base as it becomes available.

LAND USE AND PLANNING CONSIDERATIONS



PLANNING AND LAND USE CONSIDERATIONS

Compatibility of Project with Surrounding Land Use

The subject site is located astride the Winchester and Norfolk Town Line in a largely undeveloped area. The land is zoned rural residential in Norfolk (2-acre minimum lot size, except rear lots which require a minimum lot area of 4 acres) and RU-3 in Winchester (minimum lot size of 85,000 square feet). To the south and west of the site along Winchester Road, land use is an attractive mix of woodland, open field and large lot residential. East of the site, across Lake Winchester, the land is mostly wooded with open fields, woodland and residential development along Grantville Road. North of the proposed project site, the land is wooded and undeveloped. Of particular interest to the north of the site is Silas Hall Pond, a valuable natural area owned by the Nature Conservancy. The proposed project calls for an innovative and commendable property exchange agreement to protect the integrity of the Silas Hall Pond natural area. Under the agreement, 40.8 acres of the site near Silas Hall Pond will be given by the applicant to the Nature Conservancy for permanent protection. In general, the proposed project, calling for 65 house lots of 3-15 acres in size, appears to be consistent with existing and proposed land uses in the site vicinity provided environmentally sound engineering and construction practices are followed during project implementation.

Consistency of Project with State, Regional and Local Plans

The State Policies Plan for the Conservation and Development of Connecticut, 1987-1982 is a statement of the growth, resource management and public investment policies of the State. The Plan was prepared by the Office of Policy and Management (OPM) and adopted by the Connecticut General Assembly in 1987. The objective of the Plan is to give a balanced response to human, environmental and economical needs in a manner which best suits the future of Connecticut. Regional planning

organizations in the State have been encouraged by OPM to foster implementation of the Plan at the local level.

According to the State Plan, the area proposed for development is classified as "rural land." The State action strategy for rural land is "Avoiding support of structural development forms and intensities which exceed on-site carrying capacity for water supply and sewage disposal on a permanent basis, which are inconsistent with open rural character or conservation values of adjacent areas and which are more appropriately located in Rural Community Centers." The proposed project thus appears to be consistent with the goals and objectives articulated in the State Plan.

The Litchfield Hills Council of Elected Officials (LHCEO) is the official regional planning organization for the Litchfield Hills Region which includes the Towns of Norfolk and Winchester. The LHCEO is considering the adoption of a preliminary housing policy which, among other objectives, promotes the provision of meaningful open space with residential development and supports housing development that accommodates natural environmental limitations. The proposed project reflects both of these objectives and is compatible with the preliminary housing policy being considered by the LHCEO.

Both the Town of Norfolk and the Town of Winchester are in the process of updating their Town Plans of Development. The proposed project appears to be consistent with the comprehensive plans of the Towns as expressed through their zoning regulations.

To conclude, the proposed project appears to be consistent with State, regional and local plans and policies.

DESIGN CONSIDERATIONS

Based on a preliminary review of the proposed plot plan for Lake Winchester Subdivision dated 7/25/88, the following comments on subdivision design are offered for consideration.

- 1) Several of the proposed lots (e.g., Lots 2, 12, 14, 15, 33, 34, 35) are characterized by southerly slopes and have good potential for the provision of solar oriented houses. To accomplish this, the houses would simply need to be oriented on the proposed lots so that the long axis of the house faces south. Research has shown that energy savings in the northeast can be significant (12-14%) simply by orienting houses to face south. Although future homeowners can generally orient their house on the lot as they wish, suggesting a solar orientation on the site plan encourages this energy efficient development pattern.
- 2) To facilitate the use and enjoyment of Lake Winchester by future residents, consideration should be given to reserving additional land along the lake shore for public use. In particular, consideration should be given to reserving a portion of the shoreline area of Lot 58 between the proposed lake access easement and the small wetland area located to the north of this point. This is a particularly attractive area that has excellent potential for picnicking, fishing and perhaps swimming. If this area is reserved for public use, the applicant should explore the feasibility/desirability of establishing a small beach and a few picnic tables at the location. Maintenance of the area could be the responsibility of the proposed homeowner's association for the project.
- 3) The restrictive covenants proposed for the lakefront lots will serve to protect the "natural appearance" of the lakeshore and quality of the lake's water. Enforcement of the covenants by the homeowner's association may prove problematic, however, if residents expand their view or use of the lake. The Commissions are encouraged to work with the applicant to design regulations that will provide the Town with some enforcement capability in the event the homeowner's association fails to adequately enforce the restrictive covenants.

TRAFFIC CONSIDERATIONS

Access to the site is proposed to be provided through the construction of a through road between Winchester Road and Grantville Road. Most of the proposed

lots would have frontage directly along this through road, although two cul-de-sacs serving 10 lots each are also proposed under the plan.

With 65 house lots proposed, each having a minimum floor area of 2,000 square feet, the applicant will need to submit an application to the State Traffic Commission (STC) to see if a certificate is required. Prior to acting on the application, the STC will review the proposed roadway system and surrounding traffic patterns to ensure that the project will not pose a safety hazard or interfere significantly with the flow of traffic in the area.

A traffic assessment of the proposed project was prepared for the applicant by a consultant in September 1988. The report provided an assessment of surrounding roadway conditions and the impact of the project on that roadway network. Among the conclusions of the report are:

- 1) Current traffic volumes in the subject area are extremely light with no evidence of any traffic congestion.
- 2) Local roadways near Lake Winchester operate at superior levels of service.
- 3) The proposed project is estimated to generate 650-700 average weekday vehicle trips. This volume will approximately double the estimated traffic flow on Winchester Road in the vicinity of the site at the present time.
- 4) Traffic increases can be readily accommodated without reducing the existing level of service.
- 5) The minor improvements to Grantville Road are recommended to improve sight line distances, and additional traffic controls are needed with project implementation.

The traffic report prepared by the applicant was reviewed and found to be based on widely used and accepted standards in the profession. The conclusions and recommendations of the request are reasonable.

Based on a preliminary review of the internal circulation plan for the project, the road system appears to be generally well laid out with the roads following the

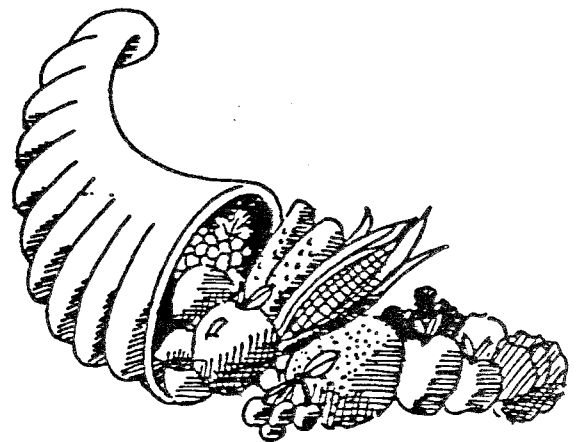
contours of the property for the most part. Several steep slope areas are encountered, however, and particular care will need to be taken so that established maximum road grades are not exceeded. Erosion and sediment controls proposed for those areas will need to be effectively implemented and maintained.

The proposed access to Lots 59-65 should be carefully scrutinized by the Winchester Planning and Zoning Commission. In effect, a shared driveway or private road of over 3,000 feet in length is proposed to service these seven lots. According to the applicant, the shared driveway would be maintained by a "second" property owners association whose membership would consist of the owners of Lots 59-65. The shared driveway would be constructed by the developer with a paved surface (probably 20 feet in width according to the project engineer), and detailed road profiles would be submitted to the Town of Winchester for review.

Of primary concern with regard to this long, dead-end driveway as proposed, is the lack of an alternate or emergency access route for residents served by the driveway. Should a fallen tree, road wash-out or accident block access between the driveway and the project's through road, no alternate vehicular exit from the site would be available. This could be more than just an inconvenience to residents if a fire or medical emergency developed while the road was blocked.

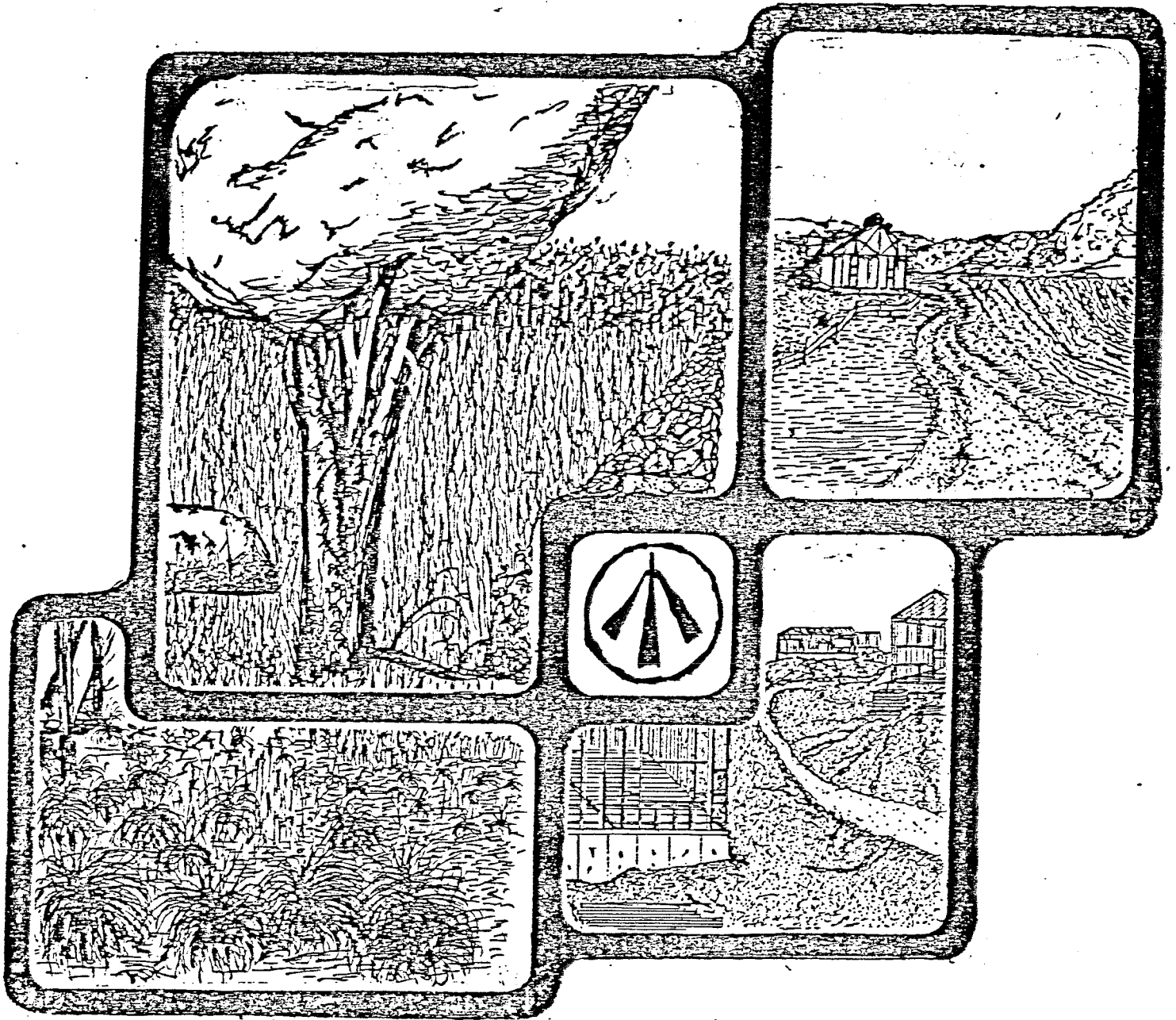
In assessing the public safety aspects of the proposed shared driveway, it is recommended that the Winchester Planning and Zoning Commission consult with the emergency response personnel from the Towns to learn of road width requirements for efficient operation of the Town's emergency response vehicles. Provisions for numerous turn-outs along the proposed shared driveway may be necessary if the drive is not built according to Town road specifications.

APPENDICIES



APPENDIX A: WINCHESTER LAKE SUBDIVISION ERT REPORT, 1984

ENVIRONMENTAL REVIEW TEAM REPORT

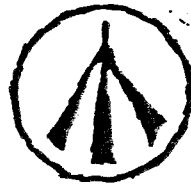


WINCHESTER LAKE SUBDIVISION NORFOLK AND WINCHESTER

KING'S MARK
RESOURCE CONSERVATION & DEVELOPMENT AREA

**KING'S MARK
ENVIRONMENTAL REVIEW TEAM REPORT**

**WINCHESTER LAKE SUBDIVISION
NORFOLK AND WINCHESTER
JUNE 1984**



King's Mark Resource Conservation and Development Area
Environmental Review Team
Sackett Hill Road
Warren, Connecticut 06754

ACKNOWLEDGMENTS

The King's Mark Environmental Review Team operates through the cooperative effort of a number of agencies and organizations including:

Federal Agencies

U.S.D.A. Soil Conservation Service

State Agencies

Department of Environmental Protection

Department of Health

University of Connecticut Cooperative Extension Service

Department of Transportation

Local Groups and Agencies

Litchfield County Soil and Water Conservation District

New Haven County Soil and Water Conservation District

Hartford County Soil and Water Conservation District

Fairfield County Soil and Water Conservation District

Northwestern Connecticut Regional Planning Agency

Valley Regional Planning Agency

Central Naugatuck Valley Regional Planning Agency

Housatonic Valley Council of Elected Officials

Southwestern Regional Planning Agency

Greater Bridgeport Regional Planning Agency

Regional Planning Agency of South Central Connecticut

Central Connecticut Regional Planning Agency

American Indian Archaeological Institute

Housatonic Valley Association

x x x x x

FUNDING PROVIDED BY
State of Connecticut

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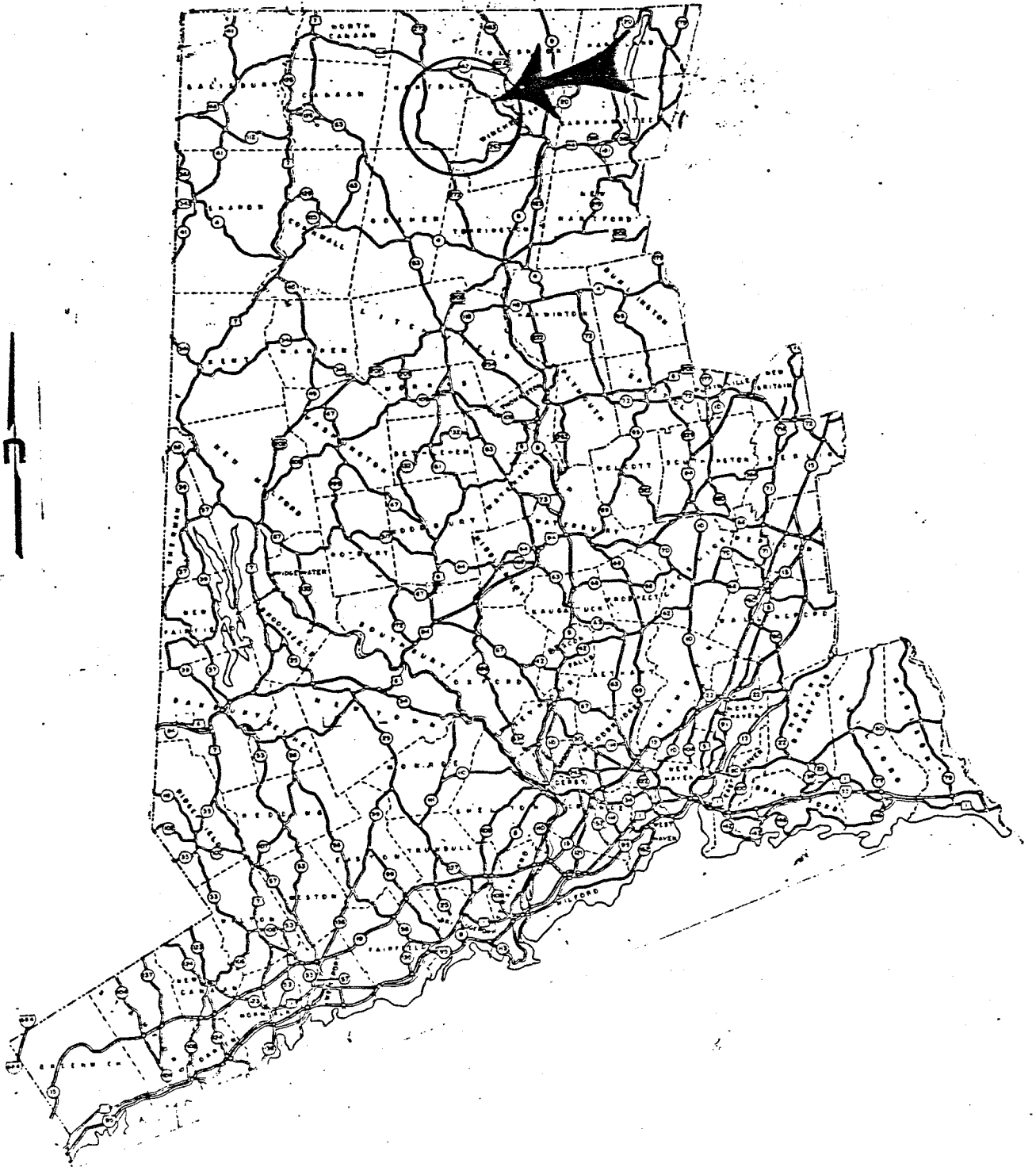
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LOCATION OF STUDY SITE



Scale 1" = 10 miles



ENVIRONMENTAL REVIEW TEAM REPORT
ON
WINCHESTER LAKE SUBDIVISION
NORFOLK AND WINCHESTER, CT

I. INTRODUCTION

The Norfolk and Winchester Planning and Zoning Commissions are considering a proposed plan for subdivision of ± 600 acres to the north and west of Lake Winchester.

As shown in Figure 1, the subject site is located astride the Norfolk and Winchester town line. The site is mostly wooded and characterized by moderate to steep slopes. Access to the site is available off Winchester Road, which bisects the property, and off Yates Road, which abuts the eastern border of the site.

The proposed project is in the preliminary planning stages and calls for 101 single unit dwellings on lots ranging in size from 4 to 8 acres (see Figure 2). All lots would be served by individual on site wells and septic systems. There is an estimated 5 miles of road to be constructed under the project which will involve at least two stream crossings.

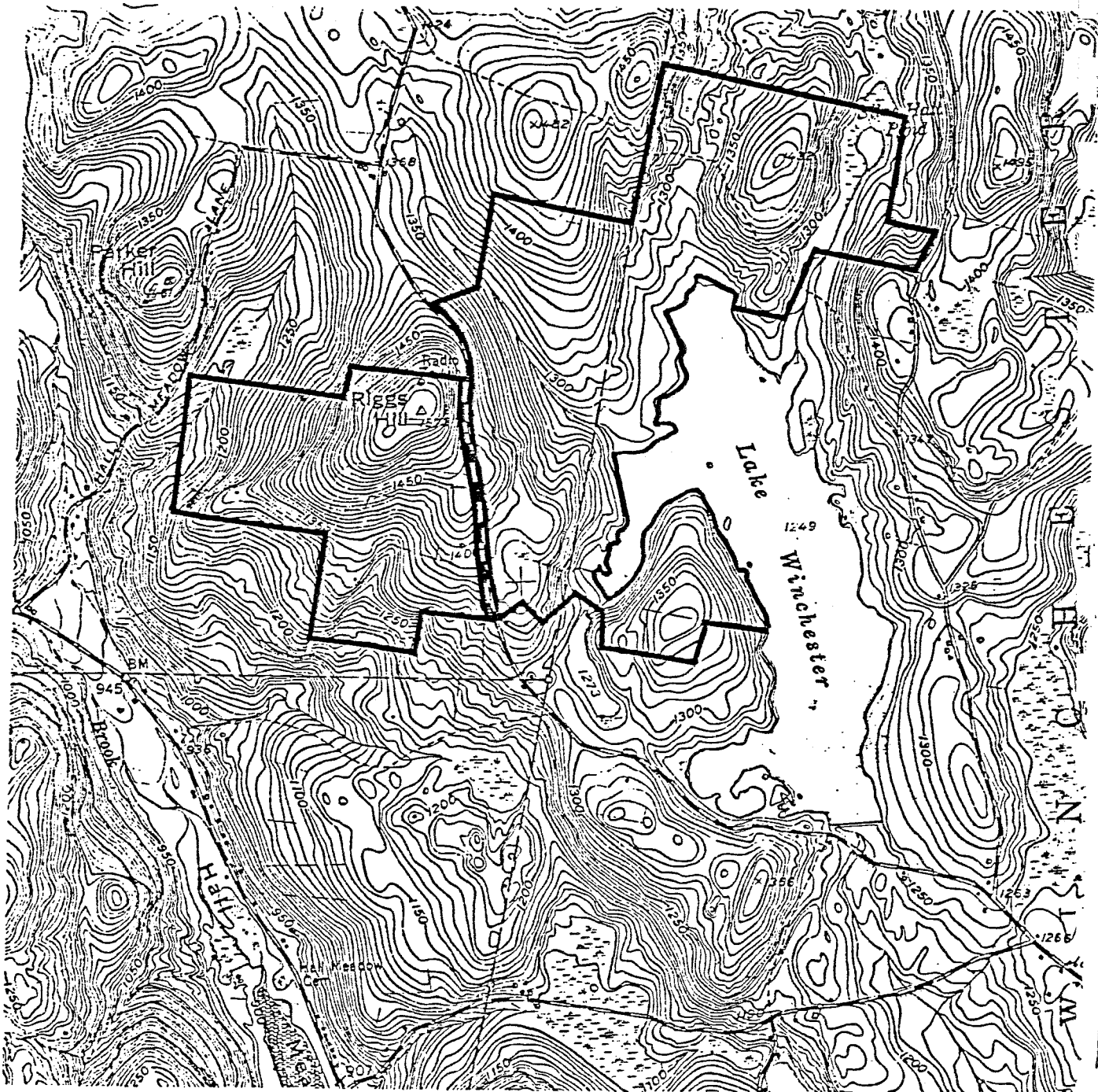
The Planning and Zoning Commissions from Norfolk and Winchester requested this ERT study to assist them in reviewing the proposed project. The ERT was requested to identify the natural resource base of the subject site and to discuss opportunities and limitations for the proposed project. Of particular concern to the Commissions is: 1) the environmental impact of the project on Lake Winchester; 2) the impact on stormwater drainage; 3) suitability of on-site soils for subsurface sewage disposal; 4) probability of adequate well yields; 5) traffic impact; 6) impact of project on fire, police, and other municipal services; and 7) erosion and sediment control.

The King's Mark Executive Committee considered Norfolk's and Winchester's request for an ERT study and approved the project for review by the Team.

The ERT met and field reviewed the site on April 25, 1984. Team members participating on this project included:

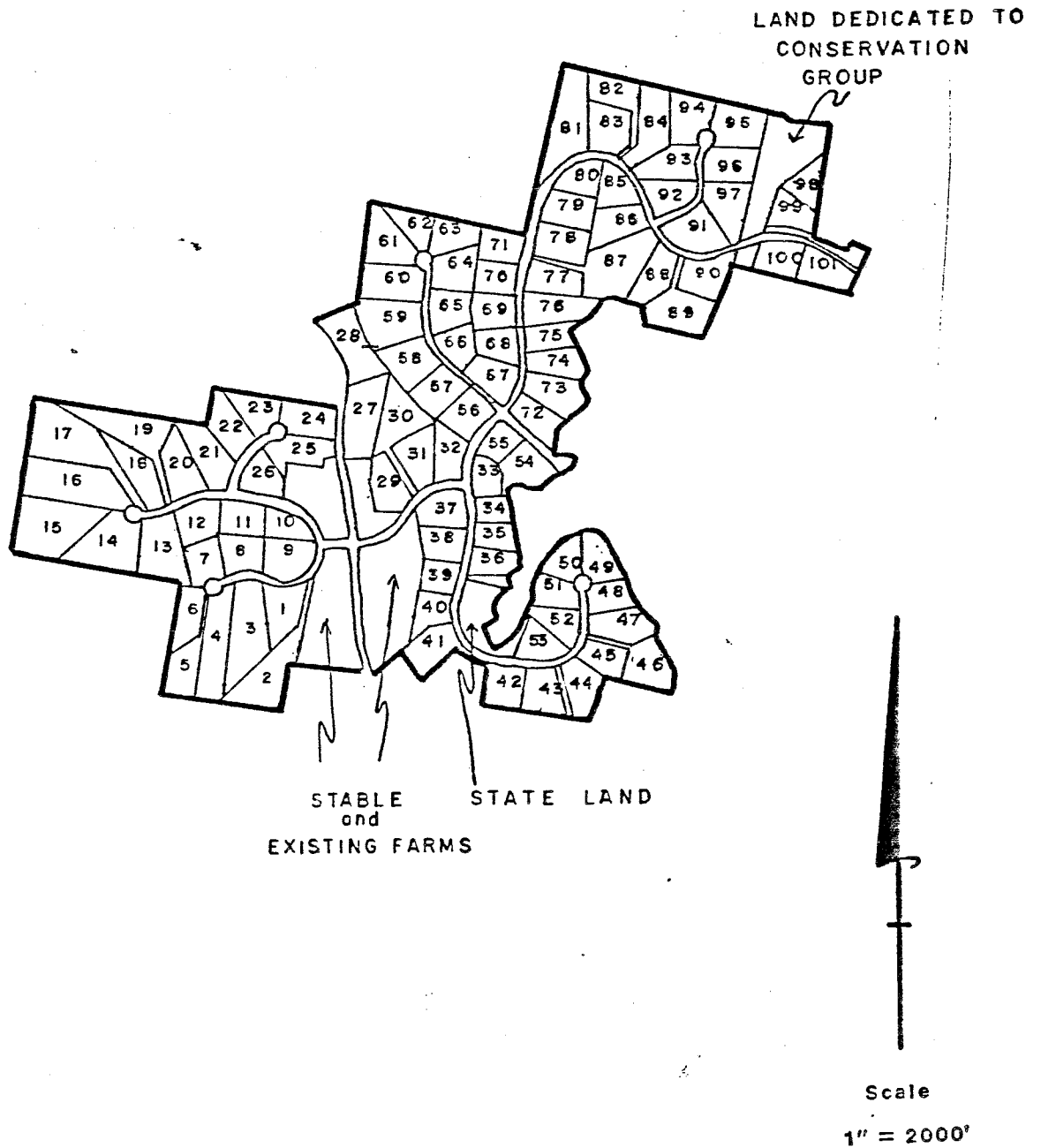
Art Cross.....	District Conservationist.....	U.S.D.A. Soil Conservation Service
William Hyatt.....	Fishery Biologist.....	CT Department of Environmental Protection
Larry Johnson.....	Planner.....	CT Office of Policy and Management
Paul Rothbart.....	Wildlife Biologist.....	CT Office of Policy and Management
Ralph Scarpino.....	Forester.....	CT Department of Environmental Protection

FIGURE 1 TOPOGRAPHIC MAP



Scale 1"

FIGURE 2 SIMPLIFIED SITE PLAN



Frank Schaub.....Sanitary Engineer.....CT Department of Health
William Warzecha.....Geohydrologist.....CT Department of
Environmental Protection

Prior to the review day, each team member was provided with a summary of the proposed project, a checklist of concerns to address, a topographic map, a soils map, and a soils limitation chart. During the ERT's field review, team members met with representatives from the Towns of Winchester and Norfolk and the landowner/developer and walked the property. Following the field review, individual reports were prepared by each team member and forwarded to the ERT Coordinator for compilation and editing into this final report.

This report presents the Team's findings. The report identifies the natural resource base of the subject site and discusses opportunities and limitations for the proposed project. It is hoped the information contained in this report will assist the towns of Norfolk and Winchester and the landowner/developer in making environmentally sound decisions.

If any additional information is required, please contact Richard Lynn (868-7342), Environmental Review Team Coordinator, King's Mark RC&D Area, Sackett Hill Road, Warren, Connecticut, 06754.

* * * * *

II. HIGHLIGHTS

1. In terms of the proposed subdivision development, the main geological limitations found on the parcel include: (1) areas where bedrock is at or near the surface of the ground; (2) areas of moderate to steep slopes; (3) the compact nature of some of the till soils, which commonly results in elevated ground water tables, and (4) wetland soils. Due to the large lot sizes proposed, in many cases these limitations can be overcome through good site planning and design. (p. 12)
2. It appears that domestic wells would have to tap the underlying bedrock aquifer. Wells drilled in bedrock generally supply small but reliable yields of groundwater. A well yield of 3 gallons per minute is generally satisfactory for most domestic uses. Well completion data for seven wells tapping bedrock in the vicinity of the property showed the yields of wells ranged between 2.5 gallons per minute and 15 gallons per minute at depths varying from 120 feet to 220 feet. The natural quality of ground water should be satisfactory. (p. 13)
3. Development of the property as planned will lead to increases in the amount of surface runoff produced during periods of precipitation. This increase should not have a significant effect on peak flows in nearby streams. However, because much of the runoff from the site takes the form of sheet flow and because of the moderate to steep slopes on the site, this increase in runoff could have a significant impact on erosion and sedimentation. For this reason, it is recommended that a detailed erosion and sediment control plan be formulated and followed prior to any development. (p. 14)
4. The wetland soils, the bog, streams and the lakeshore are proposed to be protected by means of setbacks. If the Soil Conservation Service criteria is, in fact, to be used as indicated the day of the ERT's field review, the setbacks should be considered according to the SCS booklet "A Guide for Streambelts". The setbacks in this booklet are a minimum 150 feet back from the bank of perennial streams and lakeshores or from wetlands directly adjacent to the perennial streams or lakeshores. Actual setbacks, according to SCS criteria, will vary in distance depending upon soil types (e.g., drainage, slopes, bedrock, etc.). (p. 19)
5. A review of the soil classification information and preliminary lot layout indicates on-site sewage disposal should be feasible on a large percentage of proposed lots. It is reasonable to assume a leaching area approximately 100 foot square will be identified with little difficulty on most of the lots. The steep and moderate slopes promote rapid runoff of storm drainage and also facilitate installation of ground water control drains where conditions warrant. The more difficult lots are those located closest to the wetlands and Lake Winchester where the gradient flattens out causing a high ground water problem. Proposed lots 72 through 80 may fall within this category. In order to overcome site limitations, it may be necessary to shift houses closer to the proposed roads to take advantage of drainage improvements and provide sufficient gradient for footing drain and curtain drain discharge lines. (p. 20)
6. The discharge of approximately 300 to 500 gallons a day of domestic sewage from each of the proposed lots should not adversely affect water

quality in nearby streams or the lake itself. It is more probable that fertilizers applied to individual lawn areas and road salt typically used during the winter months will impact water quality more than the combined effects of properly constructed septic systems. (p. 20)

7. The forest resource on this site could be improved by the removal of cull trees in all of the wooded sections. All of the proposed lots will encompass at least some wooded land with the potential for providing firewood for house heating. With the large lots proposed (4-8 acres), it should be possible for homeowners to acquire a major portion of their annual firewood needs if so desired. A public service forester or private forester may be of assistance in developing a management plan for the individual lots. (p. 23)
8. The proposed subdivision plan indicates that Silas Hall Pond and a + 150 foot buffer area will be dedicated to a conservation group. Due to the uniqueness of this natural area, this is an important attribute of the plan and will serve to help protect the area. With the Nature Conservancy owning the abutting land to the north, the Conservancy would seem to be a logical group to receive the dedication and manage the land. In the opinion of the Team's planner, however, consideration should be given to expanding the area proposed for dedication to ensure protection of the Silas Hall Pond area.— In particular, the drainage area feeding this Pond would be desirable to protect. At a minimum, consideration should be given to including the steep slopes to the west of the Pond in the Conservation area and also lots 98 and 99. (p. 24)
9. The Winchester Lake Property may be divided into five major wildlife types. These include mixed hardwoods, conifers, wetlands, open water, and open land. The proposed project will negatively impact existing wildlife populations. However, the project can be expected to attract more urban adapted wildlife species to the property (i.e., robins, house sparrows, raccoons, skunks). As discussed in the text of this report, a number of measures can be implemented to minimize the adverse impact of the project on wildlife. (p. 24)
10. Winchester Lake is an artificially impounded body of water covering a surface area of 229 acres and having a maximum depth of 16 feet. The lake is inhabited by bluegill, brown bullhead, calico bass, pumpkinseed sunfish, golden shiner, chain pickerel, yellow perch and largemouth bass. In its present condition Winchester Lake provides excellent fishing for the skilled angler. Fish are plentiful throughout the abundance of stumps, trees, brush and other submerged vegetation and fishing among these obstructions is a challenge. If development of the Winchester Lake subdivision is to occur, it is important from a fisheries standpoint that 1) measures be taken to minimize any increase in the nutrients entering the lake, 2) the submerged stumps and trees be allowed to remain in the lake (as opposed to their being removed to increase boating opportunities), and 3) the shoreline brush and habitat be left undisturbed. (p. 27)
11. The long cul-de-sacs proposed under this project are inconsistent with the town's requirements and represent a safety hazard. Consideration should be given to re-designing the interior road network to mitigate this concern. (p. 29)

12. *If the project were to develop 5 trips per day per unit, 505 trips would be generated by the development, most of which would probably use Winchester Road. This should not exceed its capacity, although it will be a noticeable change from present conditions. (p. 30)*

III. TOPOGRAPHY AND GEOLOGY

Topographic relief of the tract is diverse and varies from gentle to steep slopes. The steepest slopes appear to be west of Winchester Road on Riggs Hill (lots 1-26) and in areas on the east side of Winchester Road in the central portions of the site (lots 27-32). Gentle slopes occur mainly in the north central parts of the property (lots 54-78). Nearly flat slopes are found mainly on the plateaus of bedrock-cored hills within the site. Minimum and maximum elevations on the site are 1,300 feet and 1,573 feet above mean sea level, respectively.

At least three perennial streams, all of which are unnamed, traverse the subject parcel. All but one of these watercourses are feeder streams to Winchester Lake. Nearly 11,000 feet of the eastern property line borders the high-water mark of Winchester Lake. Winchester Lake is an artificial impoundment (earthen and masonry dam construction), which has a surface area of + 229 acres, a maximum depth of + 16 feet and an average depth of 13 feet. The only surface water body found within the parcel is Silas Hall Pond, which has a surface area of + 4 acres and which is located in the northeastern corner of the site (see Figure 1).

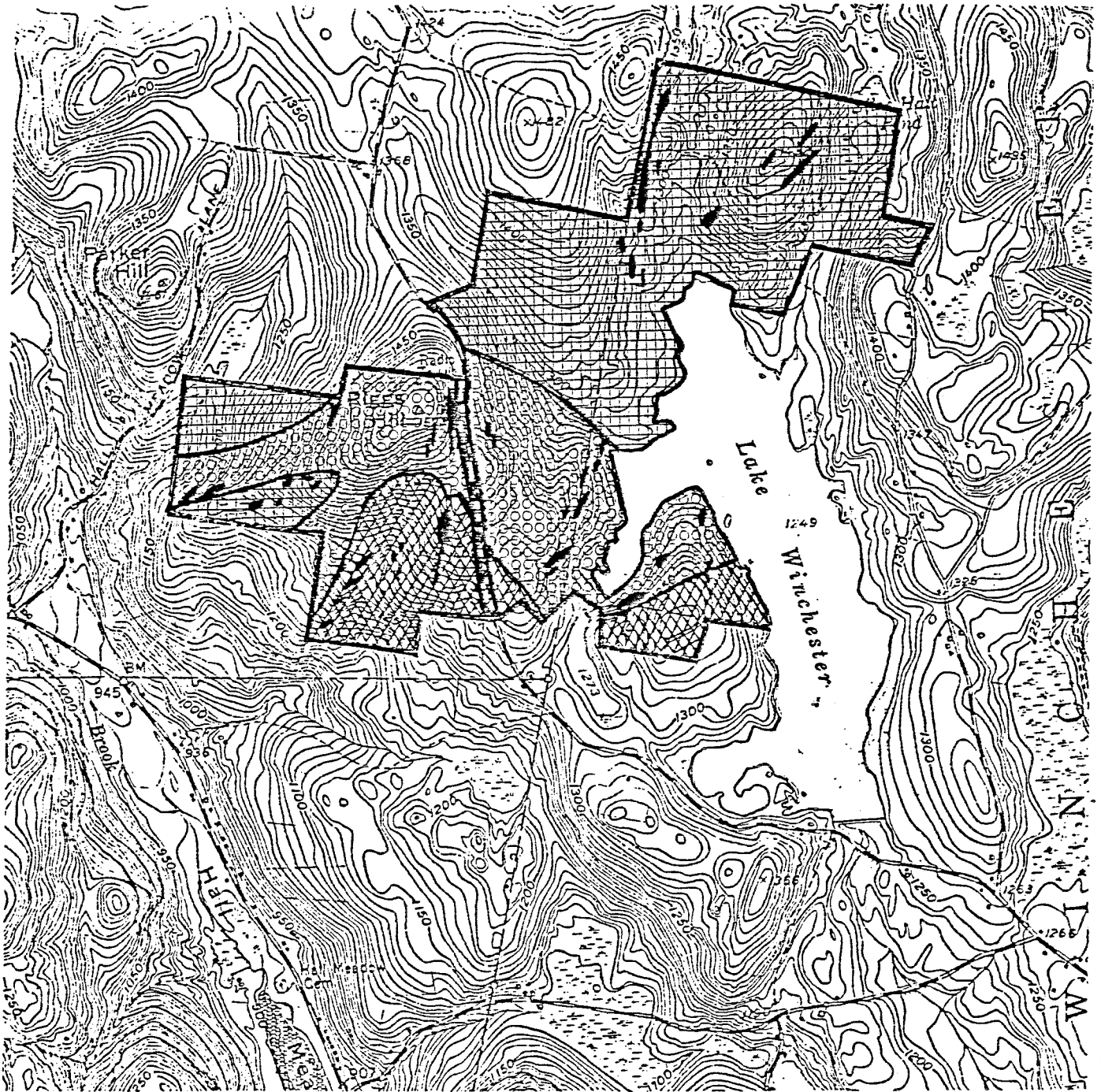
The parcel lies within the Norfolk topographic quadrangle. Bedrock and surficial geologic maps of the quadrangle have been published by the U.S. Geological Survey (respectively Map GQ-1518 by David S. Harwood and Map GQ-983 by Charles R. Warren). Numerous bedrock outcrops are visible on the property in the following areas: (1) west of Winchester Road on the slopes rising to Riggs Hill, (2) between Winchester Road and Winchester Lake in the southern parts of the site including the area comprising Lots 42-53, (3) just east of the Winchester-Norfolk town line in the northern limits of the property and (4) on the slopes of the hill which rises westward from Silas Hall Pond. Areas designated by HrE and HxC on the Soils Map (see Appendix) identify areas where bedrock is at or near ground level. The outcrops, as well as the bedrock underlying the site, consists of various types of gneisses which have undergone much deformation (folding and faulting).

Bedrock underlying or cropping out in the northern portion, as well as in some areas in the western limits of the site, consists of a fine-to-medium grained light and dark gray biotite-rich gneiss composed mainly of the minerals quartz, plagioclase, biotite, sphene, zircon, magnetite, and apatite (see Figure 3). Minor minerals in the rock include hornblende, microcline and monazite rimmed with epidote.





Bedrock underlying or cropping out in the central and southcentral parts of the site is comprised of a well layered, medium-to-coarse grained gneiss composed of the minerals hornblende, plagioclase, quartz, biotite, epidote, sphene, magnetite, apatite, zircon and locally garnet.

The third variety of gneiss rock underlying or cropping out on the site is a granitic gneiss. It is a pinkish-gray, medium-to-coarse grained granitic rock composed of nearly equal amounts of quartz, microcline, and sodic plagioclase with lesser amounts of biotite, muscovite, apatite, zircon and magnetite. The adjective "granitic" mentioned above refers to rocks which have a granite composition (i.e., feldspar (orthoclase), quartz, muscovite and/or biotite minerals).

FIGURE 3 BEDROCK GEOLOGIC MAP



Legend

-  Biotite-Quartz-Plagioclase Gneiss
-  Hornblende-Biotite Gneiss
-  Granitic Gneiss
-  Rock Outcrops

Scale

1" = 200'

See text for rock descriptions

"Gneisses" are metamorphic rocks (rocks altered by great heat and pressure deep within the earth's crust) in which thin bands of aligned elongate or flaky minerals alternate with layers of more rounded mineral grains.

The above mentioned rock types have been discussed for the purpose of thoroughness in the natural resources inventory. The differences of the three should have little if any influence on the proposed subdivision.

Gneisses, particularly the granitic gneiss variety, have been used as building stones and for other structural purposes.

The surficial geologic materials overlying bedrock throughout the property consist predominantly of till and swamp deposits (see Figure 4). Although map GQ-983 does not identify any stratified drift deposits (sand and gravel) on the site, the soil survey for Litchfield County does show a small area of + 11 acres in the northern limits which is covered by stratified drift. These materials are delineated by the symbol My (Merrimac soils) on the accompanying soils map (see Appendix).

Till, which covers most of the site, consists of rock particles of varied shapes and sizes. These particles were deposited directly from glacier ice without being reworked by meltwater streams emanating from the glacier ice. In the first few feet, the till is often relatively sandy and friable, with moderate permeability. Stoniness is also characteristic of this zone. At depths between 3 to 5 feet and greater, the till commonly becomes silty, very compact, and only slightly permeable. Since groundwater tends to travel slowly through this compact zone, an elevated (peaked) groundwater table often results.

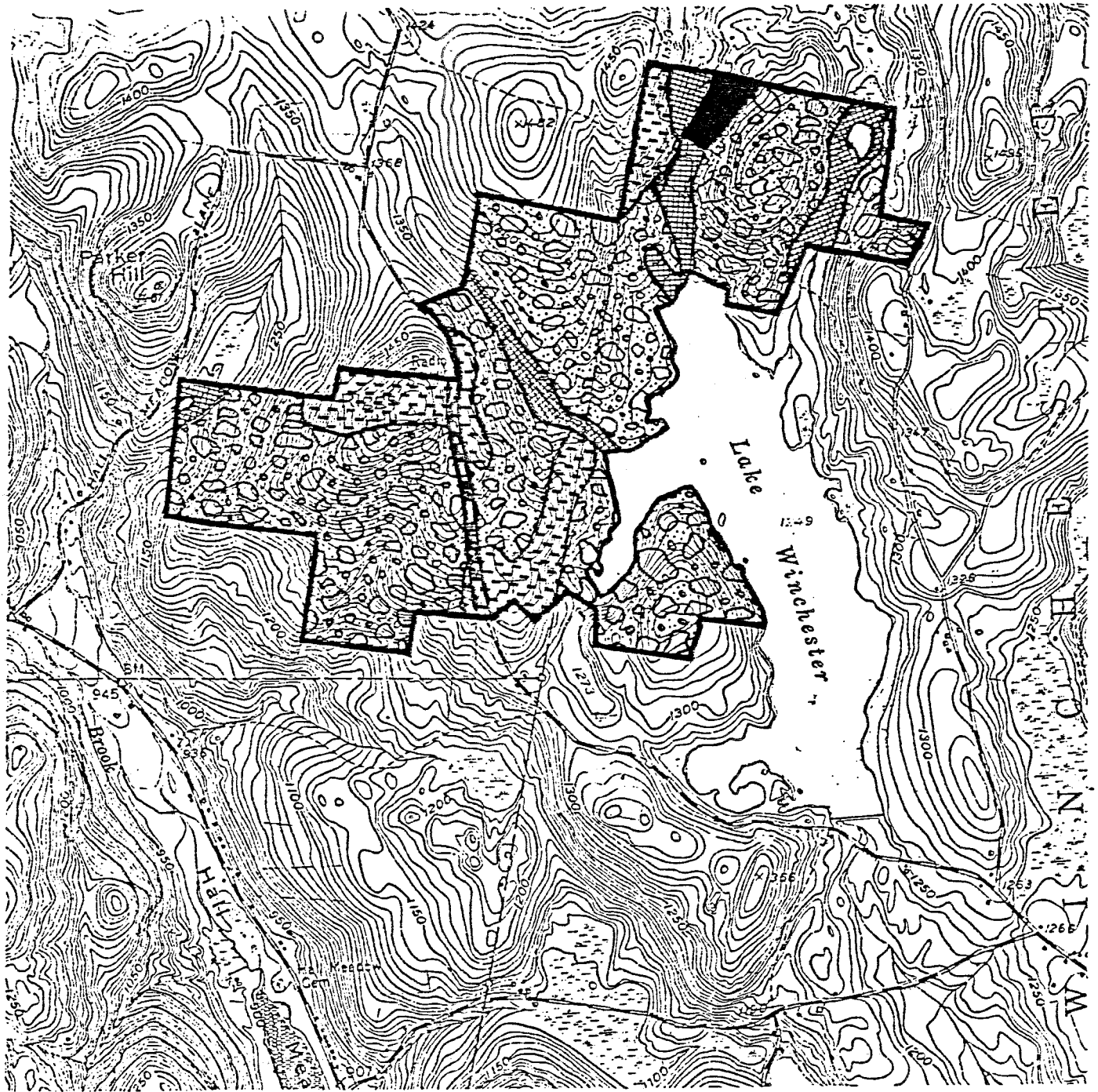
The thickness of the till is generally shallow throughout the site ranging between zero, where rock outcrops occur, to probably not much more than 10 feet at various points in between outcrops.

Overlying till, primarily along watercourses and intermittent drainage channels, in the west central and northern parts of the site are wetland (swampy) soils. They are designated by the symbol Lg (Leicester, Ridgebury and Whitman soils) on the accompanying soils map. Swamp sediments consist of poorly to very poorly drained mineral soils which are nearly level and very stony. These areas are typically seasonally wet.





The areas designated as Pk (Peat and Muck) on the soils map consist primarily of decayed organic matter which in places is interlayered with sand, silt and clay particles. These areas are found in the northern parts of the site around Silas Hall Pond and in a small portion in the western part. The ground water table is at or near the surface of the ground throughout most of the year in these soil areas. According to the preliminary site plans, a setback distance of 150 feet from wetlands surrounding Silas Hall Pond will be maintained by the developer. Development in areas covered by other regulated wetland soil types (e.g. Lg) should also be avoided if possible.

Overlying till and/or bedrock in the northern limits of the site is a surficial deposit referred to as stratified drift (see Figure 4). Stratified drift is composed of rock materials that were washed by meltwater streams from a mass of stagnant glacier ice. Because the materials were transported and deposited by water, they commonly are well-sorted by grain size and are

FIGURE 4 SURFICIAL GEOLOGIC MAP



Legend

-  Till
-  Stratified Drift
-  Swamp Deposits and Seasonally Wet Areas
-  Areas of Abundant Bedrock Outcrops

Scale

1" = 20'

*Adapted from Soils Survey for Litchfield County

layered (stratified). Sand and gravel are the main components of stratified drift. The exact thickness of the stratified drift is not known, but it is probably not much more than 10 feet.

Geologic Development Concerns

In terms of the proposed subdivision development, the main geological limitations found on the parcel include: (1) areas where bedrock is at or near the surface of the ground; (2) areas of moderate to steep slopes; (3) the compact nature of some of the till soils, which commonly results in elevated ground water tables and which also makes excavation with hand tools difficult; (4) areas of seasonal wetness (delineated as Lg soils on the soils map); and (5) more permanently wet soil areas (designated by the symbol Pk (Peat and Muck) on the Soils Map).

These geologic limitations will weigh heaviest on the ability to provide adequate subsurface sewage disposal systems serving homes constructed in the subdivision, since public sewers are not available. In many cases, proper planning and engineering can overcome some of these limitations. Because of the large lot sizes (4-8 acres) proposed, it seems likely that this would allow the applicant greater flexibility for finding a suitable area for a sewage disposal system than, for instance, would be possible with a one or two acre lot. However, if some of the geologic limitations mentioned above predominate on a particular lot, finding a suitable area for the installation of a sewage disposal system may still be problematic.

Once septic systems are engineered and approved by the proper authorities (i.e., state, local or district health department), it is important that the systems be installed properly according to design specifications and also be properly maintained (e.g., pumped regularly (3-5 years) by the homeowner).

Interior roads or house foundations constructed in shallow bedrock areas (HxC or HcE on Soils Map) may require some blasting. In view of the moderate to steep slopes found in these areas and the chance of blasting, there is a potential for erosion and sedimentation. For this reason, it is recommended that a detailed erosion/sediment control plan be formulated and implemented prior to any development.

Based on the subdivision plan, it appears interior roads will cross some of the wetland areas within the parcel. Wetland crossings are generally feasible provided they are properly designed (e.g., culverts are properly sized and installed, permeable road base fill material is used). The roads should be constructed at least 1.5 feet and preferably 2 feet above the surface elevation of the wetlands. This will allow for better drainage of the roads and decrease the frost heaving potential of the road. It is recommended that any road construction through wetland areas be done during the dry time of the year with adequate provisions for effective erosion and sediment control. Detailed plans for any proposed road crossings through wetlands should first be submitted to the proper Town authorities and commissions for their review, comment and final approval prior to beginning any construction.

IV. WATER SUPPLY

Since there are no public water supply lines accessible to the parcel, it seems likely the proposed subdivision would be served by individual on-site

water supply wells. Due to the lack of a suitable stratified drift (sand and gravel) aquifer on-site, which, depending upon certain hydrogeologic characteristics of a particular area may produce a high yielding well, it appears wells would have to tap the underlying bedrock aquifer. Wells drilled in bedrock generally supply small but reliable yields of groundwater. However, since the yield of a given well depends upon the number and size of water bearing fractures that it intersects, and since the distribution of fractures in bedrock is irregular, there is no practical way, outside of expensive geophysical testing, of predicting the yield of a well drilled in a specific location. Because fractures in the rock generally occur within the first 100 to 150 feet of the surface, it has been shown that the probability of increasing the yield of a well decreases with depth below this level.

Each well should ideally be located on a relatively high portion of a lot, properly separated from the sewage disposal system or any other potential pollutant (e.g., fuel oil storage tank, etc) and in a direction opposite the expected direction of ground water movement. Of particular concern in some portions of the site are areas having shallow depths to bedrock and moderate to steep slopes. These adverse conditions can allow for the rapid movement and wide dispersal of sewage effluent through fractures in the bedrock without providing adequate filtration and renovation of the sewage effluent. As a result, there is a potential for wells, which may also derive their source of water from the same rock formation, to be subjected to septic effluent contamination.

In areas where a number of wells are drilled relatively close together, there is a chance of well interference (that is, the yield of one well detracting from the yield of another). As a result, it is advisable to space wells at least 250 to 300 feet apart if possible to minimize the risks of mutual interference. Due to the large lot sizes proposed, it seems likely the suggested separating distances could be maintained without too much difficulty.

In the lower Housatonic River basin, 294 wells tapping crystalline bedrock (i.e., gneisses, schists, etc.) were surveyed for Connecticut Water Resources Bulletin No. 19. Of these, approximately 77 percent yielded 3 gallons per minute or more, while 30 percent yielded 9 gallons per minute or more. A well yield of 3 gallons is generally satisfactory for most domestic uses.

The team's geohydrologist reviewed well completion data for seven wells tapping bedrock on Winchester Road, Hall Meadow Road and School House Road, all of which are in the vicinity of the property. It is presumed these wells tap a rock unit which is the same as, or at least similar to, the rock units underlying the site. These data showed the yields of wells ranged between 2.5 gallons per minute and 15 gallons per minute at depths varying from 120 feet to 220 feet.

The natural quality of ground water should be satisfactory. In some rock units, there may be sufficient amounts of iron and/or manganese minerals to lower the overall quality. If elevated iron and/or manganese levels are present in the water, it may be necessary to provide suitable treatment filters.

V. HYDROLOGY

As shown in Figure 5, most of the subject site east of Winchester Road drains into Winchester Lake. At the outlet point of Winchester Lake, the watershed drains an area of approximately 1,455 acres or about 2.8 square miles.

Most of the property west of Winchester Road lies in the watershed of Hall Meadow Brook. Surface runoff in the northwest portion drains mainly by sheet flow into an unnamed tributary of Hall Meadow Brook. The southwest part of the parcel drains southerly by sheet flow until intercepted by intermittent drainage channels and/or perennial streams en route to Hall Meadow Brook.

As shown in Figure 5, a small 35 acre portion of the property in the northern limits of the site drains northerly into a wetland, which forms the headwaters for an unnamed feeder stream. This stream ultimately drains into Grant Swamp, north of the site. Surface runoff throughout the property is controlled by the underlying bedrock.

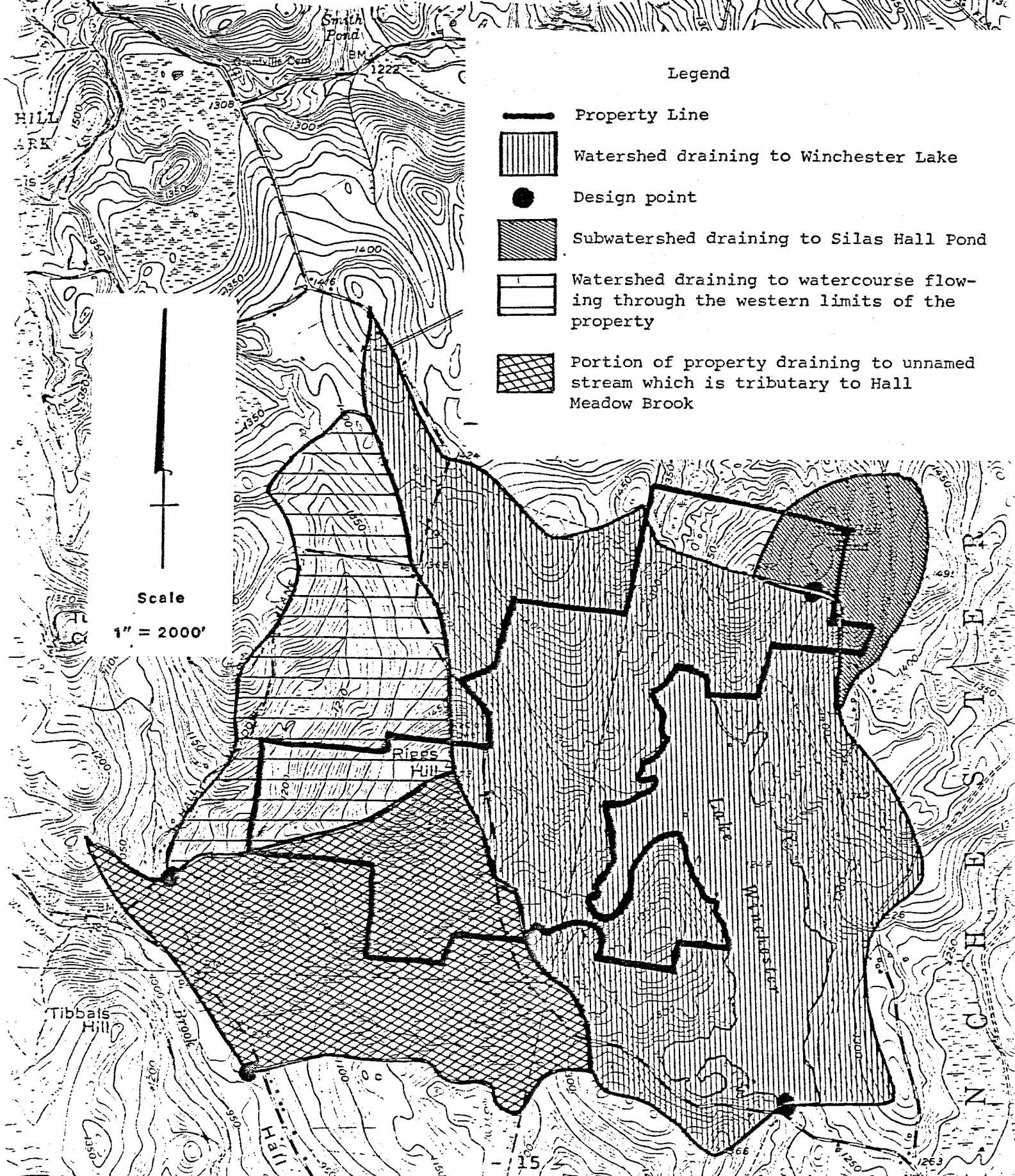
Development of the property as planned will lead to increases in the amount of surface runoff produced during periods of precipitation. These increases will arise primarily from the conversion of pervious soils to impervious surfaces (such as roofs, paved roads and driveways), compaction of soils during the construction phase, and from the removal of vegetation.

Although the subdivision plan was not, by itself, sufficient to assess peak-flow-changes to watercourses as a result of post development conditions, an estimate may be made of the runoff change likely to occur on a typical six acre parcel, an average lot size for the proposed development. The method involves the determination of runoff curve numbers, which relate amount of precipitation to amount of runoff. A higher curve number indicates that a greater volume of runoff would occur following a given amount of rainfall. It should be pointed out that the actual rise in peak flow for a specific stream depends upon the lay out of artificial drainage channels, amount of paved road surface and other man-made features, as well as upon many more subtle topographic and geologic characteristics of the property.

Runoff estimates were made with the assumption all soils are in the "B" hydrologic class (soils having moderate infiltration rate when thoroughly wetted) and that approximately a quarter of an acre of impervious surfaces would be created on a typical lot.

Under these conditions, it is estimated development would increase the curve number on a six acre parcel, typical of the subdivision, by 2 (from 55 to 57). During a 25 year storm event, the runoff depth would increase from 1.23 inches to 1.37 inches, an increase of about 11%. This increase should not have a significant effect on peak flows in nearby streams. However, because much of the runoff from the site takes the form of sheet flow and because of the moderate to steep slopes on the site, this increase in runoff could have a significant impact on erosion and sedimentation. For this reason, it is recommended that a detailed erosion and sediment control plan be formulated and followed prior to any development. Also, as a matter of policy, a stormwater management plan for the pre- and post-development runoff from the site should be prepared by the applicant and included with the final

FIGURE 5 WATERSHED BOUNDARY MAP



Legend

- Property Line
- ▨ Watershed draining to Winchester Lake
- Design point
- ▩ Subwatershed draining to Silas Hall Pond
- ▭ Watershed draining to watercourse flowing through the western limits of the property
- ▧ Portion of property draining to unnamed stream which is tributary to Hall Meadow Brook

Scale

1" = 2000'

subdivision proposal. Downstream culverts and/or flood prone areas should be considered in the preparation of this plan.

Flood Prone Areas

A map showing special flood hazard areas has been prepared by the Department of Housing and Urban Development (Federal Insurance Administration) for the town of Norfolk. Based on this map, no flood hazard areas have been identified on that portion of the subject site which lies in the town of Norfolk. Nevertheless, there may be swampy or topographical low depressions within this portion of the property that may be subject to wetness and perhaps some flooding during periods of particularly heavy rain.

A Flood Boundary and Floodway Map for the town of Winchester has also been prepared by the Department of Housing and Urban Development (Federal Insurance Administration). This study includes maps which identify areas throughout the town that are subject to flooding during the 100 and 500 year storms. A '100' year flood is a flood with a one chance in 100 or 1% chance that it will happen in any year. A '500' year flood would have a one chance in 500 or 0.2% chance of occurring in any given year. It should be pointed out that this does not mean a flood of the magnitude mentioned above will occur only once in a 100 or 500 year period. The probability of occurrences remain the same each year regardless of what happened the year before.

According to the map, the '100' year flood boundary consists of a + 30 foot band lying around Winchester Lake. There are no other areas identified within this part of the site which would be subject to flooding during the 100 or 500 year flood. However, as mentioned earlier, there may be swampy or topographically low-lying areas within the site that may be subject to wetness and perhaps flooding during periods of particularly heavy rain. One such area, observed the day of the ERT's field review, is located around Silas Hall Pond in the area identified as Pk on the soils map. Other areas which may be subject to limited flooding include those areas designated as Lg (Leicester, Whitman, and Ridgebury) on the soil map.

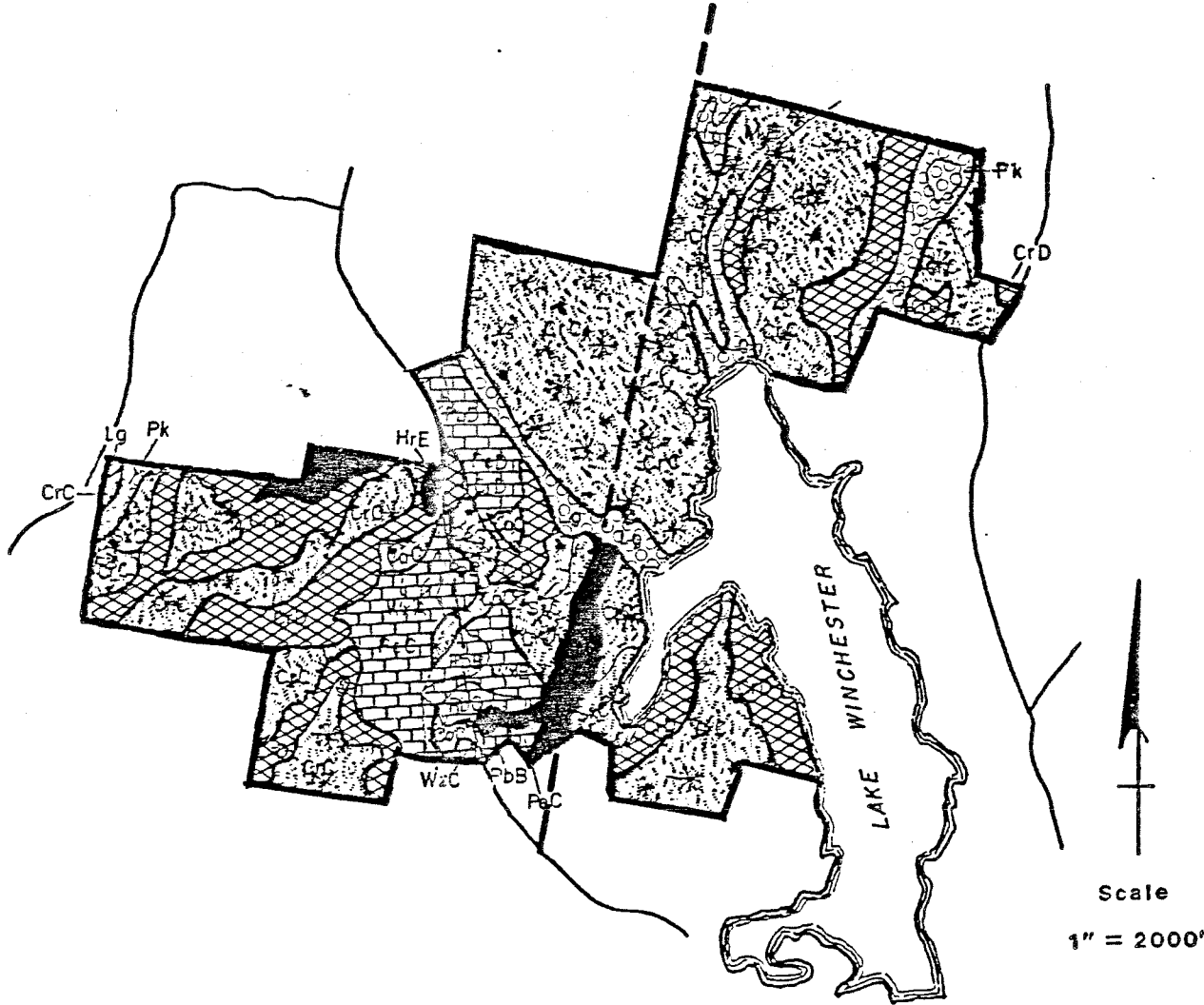
Some wetland areas, like the one designated Pk, perform important positive hydrological functions such as: (1) serving as a flood and stormwater retention area, which reduces downstream flood flows during periods of heavy precipitation; (2) improving surface water quality through various biochemical processes; and (3) trapping sediments from upstream areas. For these reasons, it is recommended that disturbance of wetland areas be avoided, if possible.

VI. SOILS






A soils map of the subject site is presented in the Appendix of this report together with a Soils Limitation Chart. The Soils Map identifies the geographic location of the various soil types which have been identified in this area. The Soils Limitation Chart identifies the major limiting factors with regard to alternate uses of the various soil types. By comparing the Soils Map with the Soils Limitation Chart, the general suitability of various soil areas for alternate land uses can be assessed.

Figure 6 summarizes the major soil characteristics of the site. A more detailed discussion of the various soil types is available in the Soil Survey of Litchfield County, available at the Litchfield County Conservation District (567-8288).

FIGURE 6 MAJOR SOIL CHARACTERISTICS



Legend

-  Shallow to bedrock soils on moderate to steep slopes
-  Inland wetland soils
-  Deep soils on steep slopes (>15%)
-  Deep soils on slight to moderate slopes
-  Hardpan soils on moderate to steep slopes

The vast majority of the proposed homesites have been proposed on four major soil types. The suitability of each of these soil types for homesite construction is discussed below.

- (1) Charlton very stony fine sandy loam on slopes of 3-15% (soil map symbol CrC). This soil comprises + 232 acres and + 39 percent of the proposed lots on the 600 acre site.

This soil is deep and well drained. Limitations for all urban uses are caused by slope and stoniness and are rated moderate. The severity of the limitation increases as slopes approach 15% and as the amount and size of stones increases. Care in selecting homesite location on individual lots can reduce the amount of earthmoving and stone removal needed for basements and drives.

For septic systems, management practices which can be used to overcome slope and stoniness soil limitations are: 1) land shaping and/or stone removal, 2) enlarging the leaching area, and 3) serial tile distribution. Construction of leaching fields should be avoided when the soil is wet so as to prevent soil smearing of leaching field trenches.

- (2) + 29 acres on the westside of Winchester Road south of Riggs Hill is mapped as Paxton very stony fine sandy loam on slopes of 3-15%. (Soil map symbol PeC). This soil, although well drained, has a slowly permeable hardpan at about 2 feet.

For septic systems, management practices which can be used to overcome soil limitations caused by the hardpan layer are: 1) percolation testing at the wettest time of the year, 2) use of interceptor drains over the hardpan, 3) use of large field, sand filter, or mound system, 4) land shaping and/or stone removal, 5) avoiding construction when wet to prevent soil smearing, and 6) use of serial tile distribution.

For homes with basements, footing drains can prevent water from entering the foundation walls.

For roads and drives, adequate drainage of road subgrade is needed to prevent frost heaving.

- (3) Adjacent to the lake and the two perennial streams entering the lake, are 30 acres of soil areas mapped as Sutton very stony fine sandy loam on slopes of 3-15%. (Soil map symbol SxC). The Sutton soils have a seasonal high water table from late in fall to early in spring.

For septic systems, management practices which can be used to overcome soil limitations caused by the seasonal high water table are: 1) percolation testing at the wettest time of the year, 2) regional drainage, 3) enlarging the leaching area, 4) land shaping and/or stone removal, and 5) serial tile distribution.

- (4) In the northernmost portion of the property, west of Silas Hall Pond, is located + 15 acres of Merrimac sandy loam on slopes of 3-8%. (Soil map symbol MyB). This soil is somewhat excessively well drained and is underlain with layers of sand and gravel at a depth of about 2 feet.

For septic systems, this soil may have a severe limitation due to the poor filtering capacity of the underlying layers of sand and gravel. Pollution of wells may be a hazard. Therefore, the septic systems and wells should be located with greater separating distances than normally required.

The Merrimac soil is a good source of sand and gravel which may be suitable for road subgrades.

On the following soil areas, the conceptual plan generally indicates that no houses would be erected:

- (1) + 157 acres or + 26 percent of the site consists of Charlton very stony fine sandy loam on slopes of 15-35%. (Soil map symbol CrD). Limitations are severe for all urban uses primarily because of the steepness of slopes.
- (2) There are also + 18 acres of Paxton fine sandy loam, very stony and non-stony located on slopes of 15-35%. (Soil map symbols PbD, PeD). Although well drained, this soil has a slowly permeable hardpan layers at depths of about 2 feet. Limitations are severe for all urban uses due to slope and the slow permeability of the hardpan.

Any roads or drives should be constructed, as much as possible, on the contour or cross slope rather than up and down hill.

- (3) + 25 acres mapped as Hollis very rocky soil, shallow to bedrock on slopes of 3-15% and 15-35%. (Soil map symbols HxC, HrE).

Even though no homes are proposed on these steep slopes and/or shallow to bedrock areas, some sections of roads and drives are proposed on slopes exceeding 10%. Alternate road locations with less steep grades, although desirable, could lead to more interior roads and more lots of smaller sizes than is currently proposed.

- (4) Proposed stable area and pastures comprise + 32 acres of prime and important farmland soil areas. (Soil map symbols CaC, PbB, PbC, WxA and WxB). With average management, the acreage can support approximately 1 horse per 2 acres or + 16 horses. With good management, 1 horse per acre or + 32 horses. (Good management = liming and fertilizing pastures according to soil tests, pasture rotation, clipping of pastures, manure at 5-10 tons per acre). Overuse of the pastures can result in soil erosion and possibly undesirable nutrient enrichment of the lake from rainfall runoff.
- (5) The wetland soils (i.e., Soil map symbols Lg and Pk) and the bog, streams and the lakeshore are proposed to be protected by means of setbacks. If the Soil Conservation Service criteria is, in fact, to be used as indicated the day of the ERT's field review, the setbacks should be considered according to the SCS booklet "A Guide for Streambelts". The setbacks in this booklet are a minimum 150 feet back from the bank of perennial streams and lakeshores or from wetlands directly adjacent to the perennial streams or lakeshores. Actual setbacks, according to SCS criteria, will vary in distance depending upon soil types (e.g., drainage, slopes, bedrock, etc.).

The SCS booklet also lists compatible and non-compatible land uses within the setbacks which could be used in developing easements or deed restrictions, etc.

Erosion and Sediment Control

Erosion and sediment controls during construction will be very important so as to prevent sediment from reaching the lake.

The final plan should include the following if erosion and sedimentation is to be kept to a minimum.

- 1) Construction in phases of designated areas as currently proposed.
- 2) Land disturbance for roads and homes should be kept to a minimum (Minimum road cuts and fills via proper siting on least sloping areas).
- 3) Temporary controls within, and on edges of, disturbed areas such as: diversions; hay bale or fabric filter fences and checks in water-courses; timely seeding of temporary vegetative cover if bare soil areas are to be left without cover over winter; mulching.
- 4) Permanent vegetative cover specifications (liming, fertilizing, seed mixes, mulches.)

The SCS/Conservation District (567-8288) is available to review the E&S plan before approval of the project by the towns. In this regard, it should be noted that by July 1, 1985, the towns in Connecticut will be required by State law to adopt and start enforcing an E&S Control Ordinance on any subdivision disturbing 20,000 sq. ft. or more of land.

VII. ON-SITE SEWAGE DISPOSAL

A review of the soil classification information and preliminary lot layout indicates on-site sewage disposal should be feasible on a large percentage of proposed lots. It is reasonable to assume a leaching area approximately 100 foot square will be identified with little difficulty on most of the lots. The steep and moderate slopes promote rapid runoff of storm drainage and also facilitates installation of ground water control drains where conditions warrant. The more difficult lots are those located closest to the wetlands and Lake Winchester where the gradient flattens out causing a high ground water problem. Proposed lots 72 through 80 may fall within this category. In order to overcome site limitations, it may be necessary to shift houses closer to the proposed roads to take advantage of drainage improvements and provide sufficient gradient for footing drain and curtain drain discharge lines.

The discharge of approximately 300 to 500 gallons a day of domestic sewage from each of the proposed lots should not adversely affect water quality in nearby streams or the lake itself. The proposed density of this development allows for adequate dilution of nitrates and proper construction of individual subsurface sewage disposal systems should provide sufficient treatment for bacteria and virus. Phosphates should also be readily absorbed by the soil. It is more probable that fertilizers applied to individual lawn areas and road salt typically used during the winter months will impact water quality more than the combined effects of properly constructed septic systems.

Individual lot testing will provide local health agencies with the necessary information to determine suitability for leaching purposes. Prior to performing soil testing, the health agencies may require the road and property corners be flagged in order to accurately determine location in the field. If thorough testing of any proposed lot fails to identify a satisfactory leaching area and unsuitable conditions as identified in Section 19-13-B103e (a)(3.) exist, the lot should be combined with adjacent properties or otherwise removed. It is likely that many of the proposed lot lines will require some adjustment prior to forward submission to the Planning and Zoning Commissions. Due to the soil types, steep slopes, and ground water conditions, it is also probable that a high percentage of the proposed lots will require detailed plans prepared by a registered professional engineer.

VIII. VEGETATION

The vegetation for this area can be divided into 4 broad vegetation cover types. Each of these areas is described below under the heading "Vegetative Type Descriptions". In general, most of the property is forested. The exceptions are open fields along the Winchester/Norfolk Road and a swamp/bog type in the far northeastern corner of the property.

A good quantity of commercially valuable sawtimber has been removed from the property. Remaining trees are of common species and include hemlock, beech, red oak, white pine, black birch, red and sugar maple, ash and scattered hickory. Pole timber (trees 4-11 inches at breast height) and small sawtimber (trees 12-16 inches at breast height) dominate most of the parcel. Products remaining consist of sawlogs and fuelwood.

The large expanse of mixed vegetation on the property plays an important role in the aesthetics of the area and in the water storage capacity of the landscape. The forest also provides a rich renewable resource in the form of wood growth and a diversified wildlife habitat.

Vegetation Type Descriptions (see Figure 7)

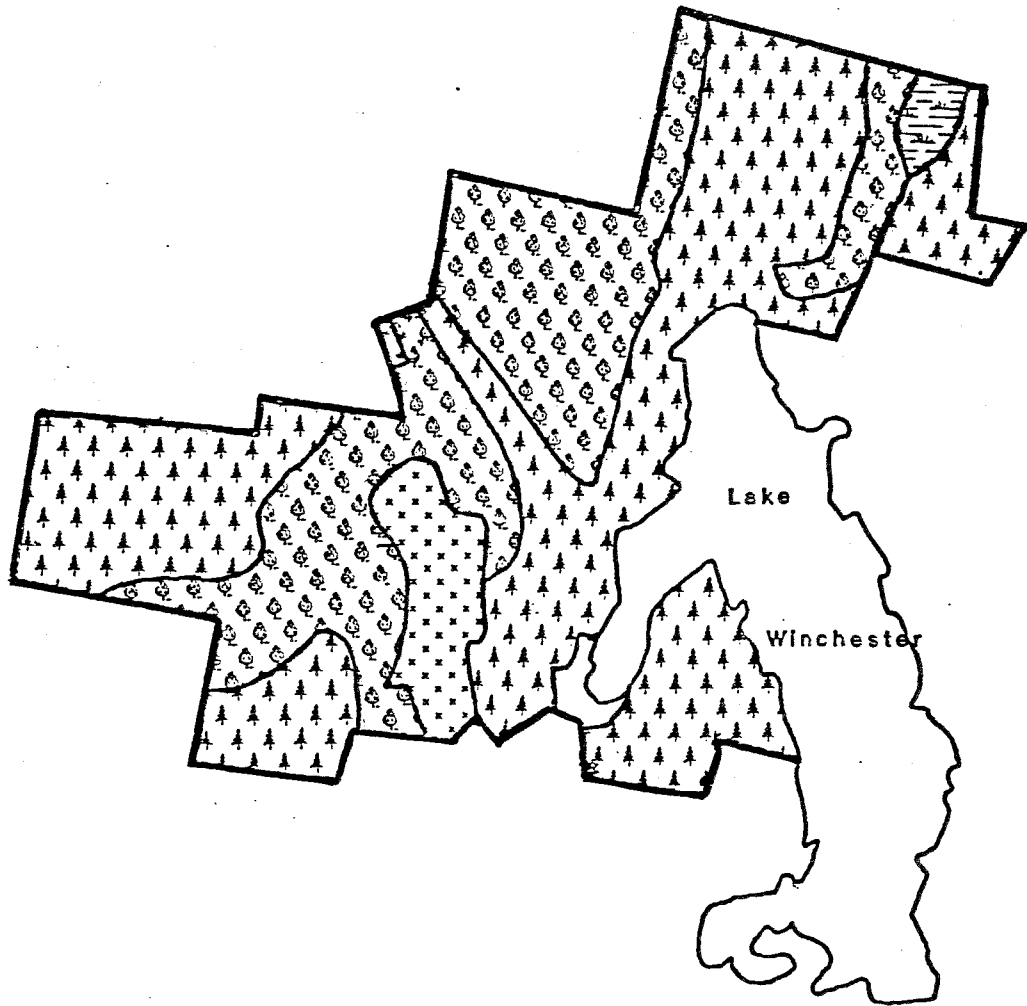
The following is a broad breakdown of vegetation cover types. These types relate pretty closely to either soil conditions, past management of the property, or a combination of both.

Type 1 - Mixed Hardwood - Most of the trees here consist of hardwood species including oak, hickory, beech, birch, ash, and maple. There are also scattered hemlock. Both sawtimber and poletimber are present. On the drier sites the tendency is to find beech, hickory, oak, and birch whereas the moister soils tend to contain a larger percentage of ash, black birch, sugar maple, and red oak. Quality of the stems for lumber production follows soil condition; the deeper, well drained soil tends to produce the better timber.





Type 2 - Softwood/Mixed Hardwood - These are areas where hemlock and white pine make up a large percentage of the stocking. These softwoods are mixed with the hardwoods mentioned above. Moister sites tend to be dominated by hemlock, whereas the drier sites contain a major white pine component.

Type 3 - Open Fields - These fields are presently being kept open for the production of hay crops.

FIGURE 7 VEGETATION TYPES



Legend

-  Mixed Hardwood
-  Softwood/Mixed Hardwood
-  Open Fields
-  Swamp/Bog



Scale

1" = 2000'

Type 4 - Swamp/Bog - This area surrounds the area known as Silas Hall Pond, and consists of scattered red maple and hemlock giving way to grasses, sedges and shrub growth close to the water's edge. Hummucks exist next to the water.

Limiting Conditions and Potential Hazards

Several factors should be considered in the maintenance of a natural forest stand. Wetland types of soils will have a water table close to the surface of the ground. This allows for shallow root penetration of the trees. Windthrow is a potential hazard in these areas. Light thinnings in these areas may help to improve the tree stability, however, openings and clearings in and along side wetland areas should be avoided if possible. Trees growing in these soils as a whole are more sensitive to disturbance than trees growing in other areas.

Alterations in the wetlands which permanently raise or lower the water table may have a negative impact on the vegetation in the immediate area. Raising the water table may drown root systems causing widespread mortality in the plant community. Lowering the water table, on the other hand, may result in conditions too droughty for the present vegetation species. These types of situations may occur when crossing wet areas with roadways, driveways, etc.

Management Considerations

The forest resource on this site could be improved by the removal of cull trees in all of the wooded sections. These cull trees take up valuable growing space and are in competition with the better growing stock. If a cull harvest is initiated, some of the cull trees should be retained in each area as valuable wildlife trees.

Any cutting which takes place in the development of this parcel should be done to take advantage of the high demand for all wood products. Firewood would probably be the largest by-product of any construction and is highly sought after. The marketing of this product should be a concern and should be planned for.

A public service forester or private forester may be of assistance in either on-the-ground planning or the marketing of the wood products.

Subdivision of the property as planned will clearly complicate the comprehensive forest management potential of the site. With a subdivision of ownership comes various opinions as to the importance of forest management. Also, as smaller parcels of land are created from larger blocks, the opportunities for forest management will diminish: larger blocks of land simply offer more alternatives for economical management of timber resources than smaller blocks.

All of the proposed lots will encompass at least some wooded land with the potential for providing firewood for house heating. With the large lots proposed (4-8 acres), it should be possible for homeowners to acquire a major portion of their annual firewood needs if so desired. Here again, a public service forester or private forester may be of assistance in developing a management plan for the individual lots.

Silas Hall Pond

Located in the northeastern corner of this property is Silas Hall Pond, a + 4 acre pond worthy of special consideration as a natural area. An extensive file has been prepared on this area by the Nature Conservancy, which owns 94 acres of land just north of the subject site in the Silas Hall Pond area. In this regard, it should be noted that the boundary line between the subject site and the Nature Conservancy's holdings in this area is being disputed. Records at the Nature Conservancy indicate that the Conservancy owns + 1/2 of Silas Hall Pond; this is not reflected in the preliminary site plan submitted by the applicant.

The Silas Hall Pond area is a unique natural area. It may be described as a bog-pond-upland forest complex affected by beaver action.

The upland forest is a maturing second growth hemlock-hardwood forest (beech, red maple, sugar maple, black birch, yellow birch, paper birch, black cherry) with mountain laurel, arrowwood, striped maple, wild sasparilla, Canada mayflower, whorled wood aster, goldthread, royal fern and hayscented fern. The bog mat is mainly sedge, sphagnum moss, leatherleaf, marsh St. Johnswort and sweet pepperbush with some high bush blueberry. There is arrowhead, water lily and arrow arum growing along the edges of the open water. Several beaver were observed in the Pond the day of the ERT's field review.

The proposed subdivision plan indicates that Silas Hall Pond and a + 150 foot buffer area will be dedicated to a conservation group. Due to the uniqueness of this natural area, this is an important attribute of the plan and will serve to help protect the area. With the Nature Conservancy owning the abutting land to the north, the Conservancy would seem to be a logical group to receive the dedication and manage the land.

In the opinion of the Team's planner, consideration should be given to expanding the area proposed for dedication to ensure protection of the Silas Hall Pond area. In particular, the drainage area feeding this Pond would be desirable to protect. As shown in Figure 5, about 35 acres of this site drains to Silas Hall Pond. Ideally, all of this land would be desirable to protect in order to preserve views from the Pond and also the water quality entering the Pond. At a minimum, consideration should be given to including the steep slopes to the west of the Pond in the Conservation area and also lots 98 and 99.

IX. WILDLIFE

The Winchester Lake Property may be divided into five major wildlife habitat types. These include mixed hardwoods, conifers, wetlands, open water, and open land.

Mixed Hardwoods

This habitat type is dominated by a beech-maple composition with birch, oak, and ash present. Scattered pockets of hemlock and white pine occur. Understory vegetation is diverse with blueberry, blackberry, grape, grasses, and numerous herbaceous species present.

The area has been cut over several times and generally is a mid-aged stand.

Wildlife typically utilizing such habitat are deer, turkey, rabbits, squirrel, fox, raccoon, and numerous non-game species.

Conifers

This habitat type is dominated by hemlock along with several small scattered pockets of white pine. Hemlock are often associated with the perennial streams traversing the property.

The hemlock understory consists of club moss, mountain laurel, grasses, and various herbaceous species. The pockets of white pine have open understories.

Wildlife utilizing this type include ruffed grouse, woodpeckers, deer, raccoon, and numerous non-game species.

Wetlands

The wetland habitat consists primarily of seasonally flooded hardwood forest. There are also sections of hemlock associated with this type. There are four perennial streams located on the site, two of which are associated with wetlands.

The hardwood type is dominated by birch, ash, and red maple. The understory is diverse with skunk cabbage, spicebush, sweet pepperbush, blueberry, sphagnum moss, ferns and grasses being abundant.

Wildlife frequenting such sites include woodcock, woodpeckers, raccoon, deer, songbirds, and numerous amphibians and reptiles.

Open Water

This type consists of Silas Hall Pond (+ 4 acres) and Lake Winchester. The pond is located within the hardwood type and bordered by a variety of shrubs. Sedges, grasses, and various herbaceous species are abundant. Presently there is one active beaver colony located on the site.

Lake Winchester (+229 acres) does not fall within the proposed site boundary but does lie adjacent to a large portion of the property. The lake is a relatively shallow (8-15 feet) open body of water with many hardwood stumps present.

Wildlife utilizing such areas include various waterfowl, raccoon, deer, red-winged blackbirds, beaver, muskrat, amphibians and reptiles, and various other non-game species.

Open Land

This habitat type consists of numerous open fields that serve as pasture and/or hay fields.

This type is utilized by a great variety of wildlife including deer, turkey, rodents, meadowlarks, and numerous non-game species.

Discussion

If the site is developed as planned, there will be an immediate negative impact on wildlife. The primary impact would be a direct loss of habitat due to roads, buildings, driveways, recreational facilities, and walkways. Another impact would be a change in habitat where forest and fields are cleared for lawns. A third impact will be the increased human presence, vehicular traffic and number of roaming cats and dogs. This will drive the less tolerant (shy) wildlife species from the site, even in areas where it has not been physically changed.

A number of measures can be implemented to minimize the adverse impacts of the project on wildlife. When developing the road and walkway networks every effort should be taken to keep erosion (silt) out of the wetlands. Culverts should have devices installed to discourage beavers. Retention impoundments could possibly be designed to benefit waterfowl. Beaver nuisance control devices should be installed at impoundments. It should be noted that subdivision design along the concept of cluster development or larger lots (5 to 10 acres) would reduce negative impacts on wildlife, since more undisturbed land would remain.

To actively encourage wildlife at the site one could:

1. Plant perennial vegetation beneficial to wildlife for food and cover.
2. Leave as many snag/den trees as possible throughout the forest lands (5 to 7/acre) for cavity nesting wildlife.
3. Exceptionally tall trees are utilized by nesting raptors and should be encouraged.
4. Mast trees (oak, hickory, beech) are food sources for a large variety of wildlife and should be encouraged.
5. Trees with vines (produce berries) should be encouraged.
6. Create diversity of habitat by making small irregularly shaped openings ($\frac{1}{4}$ to 1 acre) located in an east to west direction (to maximize sunlight). This will encourage fruit producing shrubs valuable to wildlife. Edges of openings should be feathered (gradually blended into the forest type). Openings should be maintained every three to five years.
7. With brush construct small piles along edges of openings for nesting and escape cover.
8. Any impoundments could have control structures designed to regulate water levels favorable for waterfowl. Beaver control structures should be installed.
9. Leave buffer strips (minimum of 50 to 100 feet) of natural vegetation along wetland areas to help filter and trap silt and sediments which might otherwise reach the wetland areas.

10. Three woodduck boxes should be installed on Silas Hall Pond. Also, the beaver colony located at the pond should be allowed to continue.
11. Present agricultural use of the open fields should be continued. Annual mowing should take place after August 1 to avoid potential damage to bird nests. A fifteen foot uncut border should be left surrounding the fields. This border should be mowed every three to five years after August 1. Mowing of field borders should be done on a staggered schedule.
12. Placement of bluebird boxes along edges of open fields.

To conclude, the proposed project will negatively impact existing wildlife populations. However, the project can be expected to attract more urban adapted wildlife species to the property (i.e., robins, house sparrows, raccoons, skunks).

If any further wildlife related assistance is required, the towns or landowner should feel free to contact the Western District DEP Biologist at 485-0226.

X. FISHERIES

Winchester Lake is an artificially impounded body of water covering a surface area of 229 acres and having a maximum depth of 16 feet (average depth is from 12 to 13 feet). The lake bottom is primarily composed of coarse gravel, boulders and mud. Submergent vegetation is abundant during the warm summer months despite the low transparency of the lake's tea-colored water. At the time the lake was created, no preparation was apparently taken to clear the lake basin of trees and shrubs. Rather, the impoundment was flooded and the trees were cut at ice level during the following winter. Boating is thus effectively limited to small boats throughout most of the lake.

Sampling by DEP field personnel in both 1970 and 1971 revealed the lake to be inhabited by bluegill, brown bullhead, calico bass, pumpkinseed sunfish, golden shiner, chain pickerel, yellow perch and largemouth bass. Growth rates of largemouth bass and calico bass were both noted as above average in a 1959 fishery Survey of the Lakes and Ponds of Connecticut, and the lake was evaluated as supporting a large population of good sized bluegills and sunfish along with many large sized golden shiners in a 1970 survey. Chain pickerel, however, were found to grow slowly and yellow perch were overpopulated as demonstrated by slow growth, poor condition and high abundance (both 1970 survey and 1959 report).

Moderate brush cover and weed growth should be considered beneficial in that it provides escape cover for all fish species, and spawning habitat for pickerel and yellow perch. However, extensive macrophyte growth may prevent efficient predation by bass and pickerel on forage species, often resulting in overcrowded and stunted populations of perch and sunfish and depressed growth rates in bass and pickerel. In Winchester Lake, the numerous submerged trees in combination with luxurious macrophyte growth has resulted in an abundance, possibly an overabundance, of fish hiding cover. A possible result of this is that the yellow perch population has been released from predatory control by largemouth bass and pickerel, resulting in the aforementioned overpopulation problem. At this time it appears that the Bass and sunfish

still exhibit good to average growth and condition. However, if in the construction and maintenance of the proposed Winchester Lake subdivision, an increase in the flow of sediments and nutrients into the lake should occur, this balance could be upset and the fishing value of the lake reduced. Additional weed growth could result in an overcrowding and stunting of the sunfish and a corresponding reduction in the number of largemouth bass (large populations of sunfish preying upon bass eggs and fry can drastically reduce spawning success and the subsequent recruitment of bass into the fishery. A population made up of a few old bass, unable to produce a large successful spawn and insufficient to support truly good fishing, often results). The effects of lawn chemicals and fertilizers could also be severe if they are allowed to enter the lake in quantity.

A 1969 survey showed Winchester Lake to be low in dissolved oxygen throughout much of the shallow, stump filled, north end of the lake. This report also commented that given these conditions there was some possibility of a "winterkill" occurring (under the ice and snow, light penetration, and correspondingly photosynthesis, is reduced. If life supporting oxygen is not being added to the water by photosynthesis, and it is being removed by abundant bacterial action on decaying plant, a fish kill may result if oxygen levels drop to critical levels). Any further addition of nutrients to the lake system would only serve to enhance the possibility of this occurring by increasing the amount of weeds and algae being decomposed under the ice each winter. The possibility of a summerkill occurring would also increase (several warm calm cloudy days may result in a low output of oxygen by photosynthesis. Bacterial decay of abundant plant tissue may therefore cause dissolved oxygen levels to drop to nearly critical, or critical, levels at night, often killing fish. Additionally, a breezy day may distribute the very low oxygen bottom water throughout a portion of the lake, creating conditions intolerable to fish life and resulting in a summerkill.) The aesthetic value of the lake and the property surrounding it would obviously be reduced by the odors produced by decaying fish and plants.

In its present condition Winchester Lake provides excellent fishing for the skilled angler. Fish are plentiful throughout the abundance of stumps, trees, brush and other submerged vegetation and fishing among these obstructions is a challenge. If development of the Winchester Lake subdivision is to occur, it is important from a fisheries standpoint that 1) measures be taken to minimize any increase in the nutrients entering the lake, 2) the submerged stumps and trees be allowed to remain in the lake (as opposed to their being removed to increase boating opportunities), and 3) the shoreline brush and habitat be left undisturbed.

XI. PLANNING CONSIDERATIONS

A. Consistency With Existing Plans

The proposed subdivision is located along the northern and western edges of Winchester Lake, and will consist of 101 homes on lots ranging from 4 to 8 acres in size. The intended purchasers would be New York City area residents looking for a second home, and the anticipated residency would be seasonal, according to the applicant. A complication involved in this proposal is the location of the project in two towns, and the need to coordinate approvals under two zoning regulations and two subdivision regulations.

The proposed site is located in an area designated as rural in the State's Conservation & Development Policies Plan. This would allow State funds to be used only for projects which could be served with on-site water supply and sewage disposal, and which were consistent with the area's open, rural character. One section, containing Silas Hall Pond, is shown as a Conservation area. This indicates a natural area which should be conserved rather than developed. Both towns have zoned the subject area for rural densities. The Town of Norfolk, which contains the larger section of the project, has zoned the area for 2-4 acre lots, depending on whether the lots front on State/Town roads or on private rights-of-way. The Town of Winchester, which contains the sections fronting on Winchester Lake, has zoned the area for 2 acre lots. The developers are proposing 4-8 acre sites. Given these conditions, the proposal is consistent with the character of the area and local and State plans.

B. Proposed Site Plan

The western portion of the site is characterized by steep slopes and a variety of soil types. The eastern portion has more gentle slopes, but contains wetland areas and sections along the lake where the groundwater levels may be close to the surface. The developers are proposing a subdivision of 101 units on lots of 4-8 acres. Their intention is to build a seasonal second-home development for New York area residents. Even though the sites are much larger than the required 2 acres, the soils and slope characteristics require that each lot be given careful review. Also, several road sections would appear to reach or exceed the grade limits of 10-12%.

At the time of the ERT's site review, it was not known if the State's ownership rights to Winchester Lake were fixed by water level or ground surface elevation. This could affect rights of access to the lake. State approval would be required for any installation of docks or floats.

The major site design concerns, in the opinion of the Team's planner, are access and long cul-de-sacs. The section on the west side of Winchester Road has only one access point to serve 26 lots. Consideration should be given to redesigning the proposed road network in this area to include a loop system with two access points to the lots. The design for the easterly side of the road, bordering the lake, shows one access on Winchester Road traversing the development to an access point on Yates Road. Both towns should consider requiring that this through road be constructed during the first phase of the project to insure two points of access to the lots. If this is not done, consideration should be given to redesigning the road layout to provide two access points to these lots from Winchester Road. Of concern here is the possible construction of 30-50 lots along the lake with no second access point if the development is not completed. A second concern is the length of the cul-de-sacs included in the proposal. Typical limits for these dead end roads in many towns are 500 - 1000 feet. Norfolk has a limit of 10 building lots, while the limit in Winchester is about 600 feet. The proposed cul-de-sacs in the Town of Norfolk appear to meet the 10 lot limit, even though they are 900 to 2500 feet in length. Those in the Winchester portion are all over the 600 foot limit, and one is 4000 feet long. Because of the large lot sizes, however, relatively few building lots are involved. The early completion of the through road and the later linkage of lots 43 and 44 to Winchester Road should largely eliminate any problems.

A further consideration is the pavement width required for subdivision roads in both towns. Both require a 50 foot right-of-way and a 26 foot pavement width. The developers are proposing a 22 foot pavement with an additional gravel shoulder. This is a matter of some concern to the developers, given the high cost of building a road and the extensive amount of roads in the development. Given that the roads will carry no through traffic, some reduction may be justifiable. Recent reports by the American Planning Association and the Central Naugatuck Valley Council of Governments mention the excessive road requirements of many subdivision regulations, and suggest lesser pavement widths. Many communities allow pavement widths of 22 or 24 feet on local access roads which do not carry through traffic. The requirement of a 26 foot pavement width is not consistent with the width of the existing town roads serving the proposed development. Winchester Road has a pavement width of 19 feet at the proposed access point, and Yates Road has a pavement width of only 17 feet.

Traffic Generation

The Connecticut Department of Transportation uses the following traffic generation standard in reviewing traffic impact: 10.1 trips per day for a single family home, 6.1 trips for an apartment, and 5.1 trips for a condominium. Under this system, leaving home for a destination and returning home would constitute two trips. Because this would be a seasonal development, without school trips and with reduced work trips, a figure of less than 10.1 trips per unit would be felt during the spring through fall months, perhaps mostly around weekends. If the project were to develop 5 trips per day per unit, 505 trips would be generated by the development, most of which would probably use Winchester Road. This should not exceed its capacity, although it will be a noticeable change from present conditions. Both Winchester and Norfolk should consider preparing road capacity studies to determine the impact of future development on town roads, and the need to improve their town road systems.

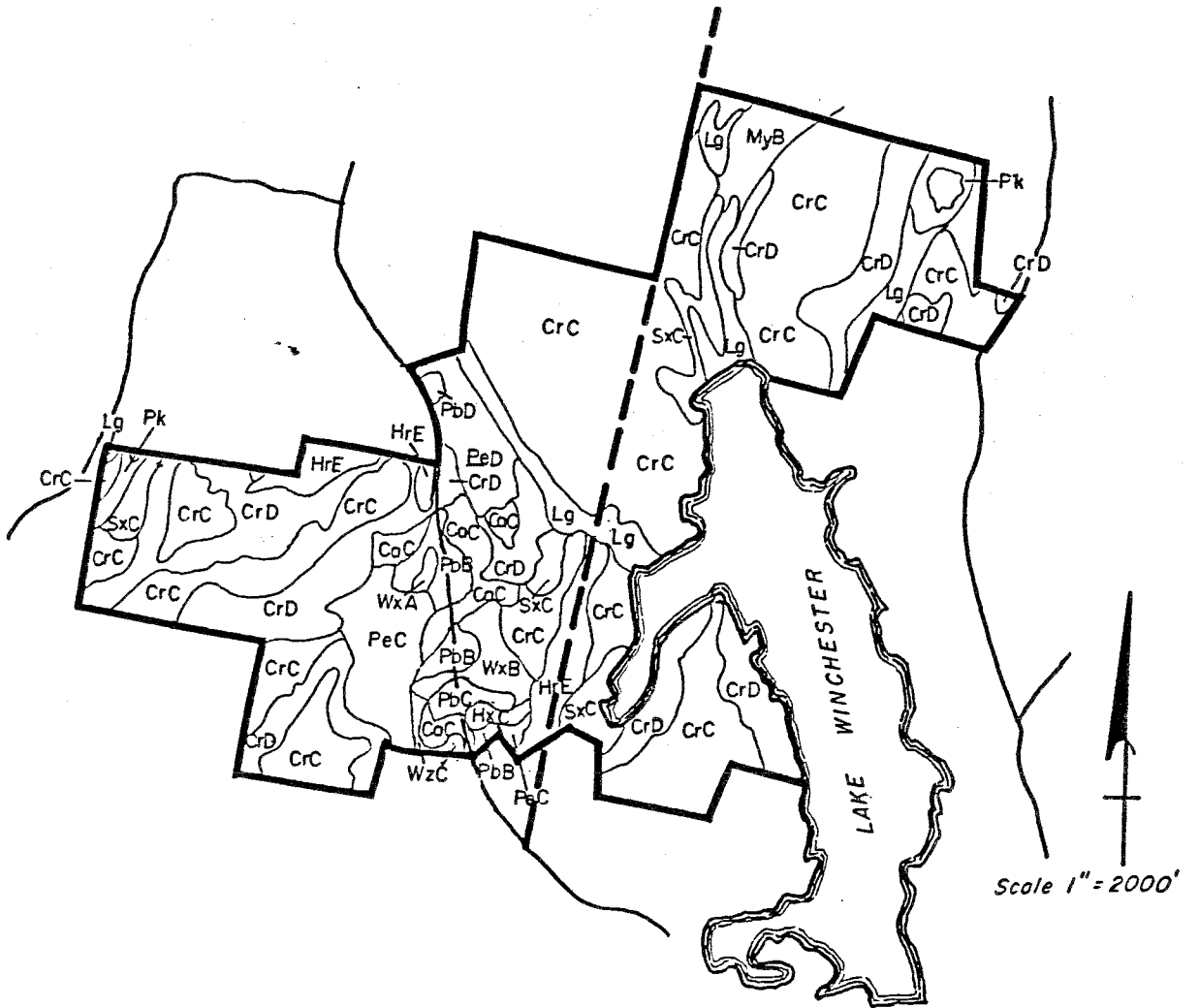
Demand for Services

As long as the development is seasonal, the large lots and expected expensive homes will likely return more in tax revenues than they will cost in services. There is nothing to prevent them from being occupied year-round, however, and there is a possibility that families with school aged children could live there year-round. There is no way to estimate the impact on police services since this one project would not require additional police staff. There would probably have to be some changes in the patrolling patterns in both towns, however. The main danger would appear to be burglary and vandalism due to the expensive homes, relative isolation and seasonal occupancy. For this the residents would have to provide their own protection, perhaps using off-season house sitters or by connecting burglar alarms to some central location. Fire protection might appear to be a problem, but this can be easily resolved through a mutual aid agreement between Norfolk and Winchester. There is a fire house in Winchester Center, only 3/4 of a mile from the development. The Winchester fire chief said that a pre-fire response plan would be prepared if the project were developed, and standpipes could be built so that water could be taken through hydrants from Winchester Lake. Consideration should be given to requiring the developer to show these on his plans and install them if the project is constructed.

XII. APPENDIX

APPENDIX

SOIL MAP



SOILS LIMITATION CHART - WINCHESTER LAKE SUBDIVISION - WINCHESTER & NORFOLK, CT

Limitation/Ratings for:

MAP SYMBOL	SOIL NAME	SEPTIC SYSTEMS	HOMESITES W/ BASEMENTS	ROADS & DRIVEWAYS	LANDSCAPING
CaC	Charlton fine sandy loam, 8-15% slopes	Moderate: smears, slope	Slight-Moderate: slope	Slight-Moderate: slope	Slight-Moderate: slope
CrC	Charlton very stony fine sandy loam, 3-15% slopes	Moderate: smears, slope	Moderate: large stones, slope	Slight-Moderate: slope	Moderate: large stones
CrD	Charlton very stony fine sandy loam, 15-35% slopes	Severe: slope, smears	Severe: slope	Severe: slope	Severe: slope
HxC	Hollis extremely rocky fine sandy loam, 3-15% slopes	Severe: depth to rock, smears, slope	Severe: depth to rock, large stones	Severe: depth to rock	Severe: depth to rock, large stones
HrE	Hollis very rocky fine sandy loam, 15-35% slopes	Severe: depth to rock smears, slope	Severe: depth to rock, slope	Severe: depth to rock, slope	Severe: depth to rock, slope
Lg	Leicester, Ridgebury, & Whitman very stony fine sandy loams	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness
MyB	Merrimac sandy loam, 3-8% slopes	Severe: poor filter	Slight	Slight	Slight
PbB	Paxton fine sandy loam, 3-8% slopes	Severe: percs slowly, smears	Moderate: wetness	Moderate: frost action	Moderate: small stones

SOILS LIMITATION CHART - CONT'D

MAP SYMBOL	SOIL NAME	SEPTIC SYSTEMS	HOMESITES W/ BASEMENTS	ROADS & DRIVEWAYS	LANDSCAPING
PeC	Paxton very stony fine sandy loam, 3-15% slopes	Severe: percs slowly, smears	Moderate: wetness large stones	Moderate: frost action	Moderate: large stones
PK	Peat and Muck	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness
SxC	Sutton very stony fine sandy loam, 3-15% slopes	Severe: wetness smears, large stones	Severe: wetness	Moderate: frost action, slope	Moderate: slope large stones
WxA	Woodbridge fine sandy loam, 0-3% slopes	Severe: percs slowly, wetness	Severe: wetness	Severe: frost action	Slight
WxB	Woodbridge fine sandy loam, 3-8% slopes	Severe: percs slowly, wetness	Severe: wetness	Severe: frost action	Slight

NOTES:

1) Limitation ratings from USDA Soil Conservation Service criteria.

EXPLANATION OF RATING SYSTEM:
SLIGHT LIMITATION: indicates that any property of the soil affecting use of the soil is relatively unimportant and can be overcome at little expense.
MODERATE LIMITATION: indicates that any property of the soil affecting use can be overcome at a somewhat higher expense.

SEVERE LIMITATION: indicates that the use of the soil is seriously limited by hazards or restrictions that require extensive and costly measures to overcome.

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, foresters, climatologists, soil scientists, landscape architects, recreation 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 - a 47 town area in western Connecticut.

As a public service activity, the team is available to serve towns and developers within the King's Mark Area --- free of charge.

PURPOSE OF THE TEAM

The Environmental Review Team is available to help towns and developers in the review of sites proposed for major land use activities. To date, the ERT has been involved in the review of a wide range of significant activities including subdivisions, sanitary landfills, commercial and industrial developments, and recreation/open space projects.

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

REQUESTING A REVIEW

Environmental Reviews may be requested by the chief elected official of a municipality or the chairman of an administration agency such as planning and zoning, conservation, or inland wetlands. Requests for reviews should be directed to the Chairman of your local Soil and Water Conservation District. This request letter must include a summary of the proposed project, a location map of the project site, written permission from the landowner/developer allowing the team to enter the property for purposes of review, and a statement identifying the specific areas of concern the team should address. When this request is approved by the local Soil and Water Conservation District and the King's Mark RC&D Executive Committee, the team will undertake the review. At present, the ERT can undertake two reviews per month.

For additional information regarding the Environmental Review Team, please contact your local Soil Conservation District Office or Richard Lynn (868-7342), Environmental Review Team Coordinator, King's Mark RC&D Area, P.O. Box 30, Warren, Connecticut 06754.

APPENDIX B: SANITATION OF WATERSHEDS

Sanitation of Watersheds

Sec. 19-13-B32. Sanitation of watersheds. Unless specifically limited, the following regulations apply to land and watercourses tributary to a public water supply including both surface and ground water sources.

- (a) As used in this section, "sewage" shall have the meaning found in section 19-13-B20(a) of the public health code: "Toxic metals" shall be arsenic, barium, cadmium, chromium, lead, mercury and silver and the salts thereof; "high water mark" shall be the upper limit of any land area which water may cover, either standing or flowing, at any time during the year and "watershed" shall mean land which drains by natural or man-made causes to a public drinking water supply intake.
- (b) No sewage disposal system, cesspool, privy or other place for the deposit or storage of sewage shall be located within one hundred feet of the high water mark of any reservoir or within fifty feet of the high water mark of any stream, brook, or watercourse, flowing into any reservoir for drinking purposes.
- (c) No sewage disposal system, cesspool, privy or other place for the deposit or storage of sewage shall be located on any watershed, unless such facility is so constructed that no portion of the contents can escape or be washed into the stream or reservoir.
- (d) No sewage shall be discharged on the surface of the ground on any watershed.
- (e) No stable, pigpen, chicken house or other structure where the excrement of animals or fowls is allowed to accumulate shall be located within one hundred feet of the high water mark of a reservoir or within fifty feet of the high water mark of any watercourse as above mentioned, and no such structure shall be located on any watershed unless provision is made in a manner acceptable to the commissioner of health services for preventing manure or other polluting materials from flowing or being washed into such waters.
- (f) No toxic metals, gasoline, oil or any pesticide shall be disposed of as a waste into any watercourse tributary to a public drinking water supply or to any ground water identified as supplying a public water supply well.
- (g) Where fertilizer is identified as a significant contributing factor to nitrate nitrogen occurring in excess of 8 mg/l in a public water supply, fertilizer application shall be made only under current guidelines established by the commissioner of health in cooperation with the state commissioner of agriculture, the college of agriculture of the University of Connecticut and

the Connecticut agricultural experiment station in order to prevent exceeding the maximum allowable limit in public drinking water of 10.0 mg/l for nitrite plus nitrate nitrogen.

- (h) Where sodium occurs in excess of 15 mg/l in a public drinking water supply, no sodium chloride shall be used for maintenance of roads, driveways, or parking areas draining to that water supply except under application rates approved by the commissioner of health, designed to prevent the sodium content of the public drinking water from exceeding 20 mg/l.
- (i) The design of storm water drainage facilities shall be such as to minimize soil erosion and maximize absorption of pollutants by the soil. Storm water drain pipes, except for crossing culverts, shall terminate at least one hundred feet from the edge of an established watercourse unless such termination is impractical, the discharge arrangement is so constructed as to dissipate the flow energy in a way that will minimize the possibility of soil erosion, and the commissioner of health finds that a discharge at a lesser distance is advantageous to stream quality. Special precautions shall be taken to protect stream quality during construction.

APPENDIX C: DECLARATION AND AGREEMENT

CLEARING OF LOTS

A maximum of 50% of any Lot area may be cleared or 4 acres, whichever is less.

No animals or poultry shall be kept on said premises other than domestic house pets or horses.

No portion of the subject premises shall be used or maintained as a dumping ground for rubbish, trash, garbage or other waste. All such material shall be stored in a hidden, sanitary container and shall be removed regularly from the premises.

LAKE FRONT LOTS

A natural buffer zone of 50 feet landward of the lakefront will be maintained. Within this 50 feet zone only dead trees and poisonous weeds may be removed. Tree limbs may be trimmed in accordance with correct forestry standards. For each lot one 50 foot wide viewing corridor will be permitted within the buffer zone. Ground cover will be replaced with approved species to prevent runoff where clearing occurs for a viewing corridor.

Between 50 feet and 200 feet only trees smaller than 6 inches in diameter at chest height may be cleared and ground cover shall be replaced with natural grasses or approved species to prevent erosion.

No fertilized lawn shall be permitted closer than 200 feet to the lake.

No house can be built closer than 150 feet to the lake.

No sand shall be imported to increase or make beaches on the lakefront.

Lots 65, 13 the Lake Access Easement (next to Lot 58) may clear a 10 foot wide path on their 20 foot right of way to gain access to the lake.

All of the foregoing are also covenants running with the land at law as well as in equity and are binding upon and insure to the benefit of the successors and assigns of the declarant and all present and future persons owning or having an interest in any of said lots or a part thereof.

The development of these premises will be subject to the design and use controls indicated by these Protective Covenants. In addition to the controls, all development proposals must still conform to the following:

1. City of Winchester Zoning Regulations (as amended).
2. Basic Building Code, State of Connecticut (as amended).

Executed at Winchester, Connecticut, this _____ day of
October, 1988.

Signed, Sealed and Delivered
in the presence of:

STATE OF CONNECTICUT

SS: _____

COUNTY OF LITCHFIELD

On this the _____ day of October, 1988, before me, the
undersigned officer, personally appeared _____
and _____, known to me (or satisfactorily proven) to be the
persons whose names are subscribed to the within instrument and
acknowledged that they executed the same for the purposes
therein contained, as their free act and deed.

IN WITNESS WHEREOF, I hereunto set my hand and official
seal.

Peter C. Herbst
Commissioner of the Superior Court

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 - a 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 the King's Mark ERT Coordinator. This request form must include a summary of the proposed project, a location map of the project site, written permission from the landowner/developer allowing the Team to enter the property for 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 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 Resource Conservation and Development Area, 322 North Main Street, Wallingford, Connecticut 06492. King's Mark ERT phone number is 265-6695.