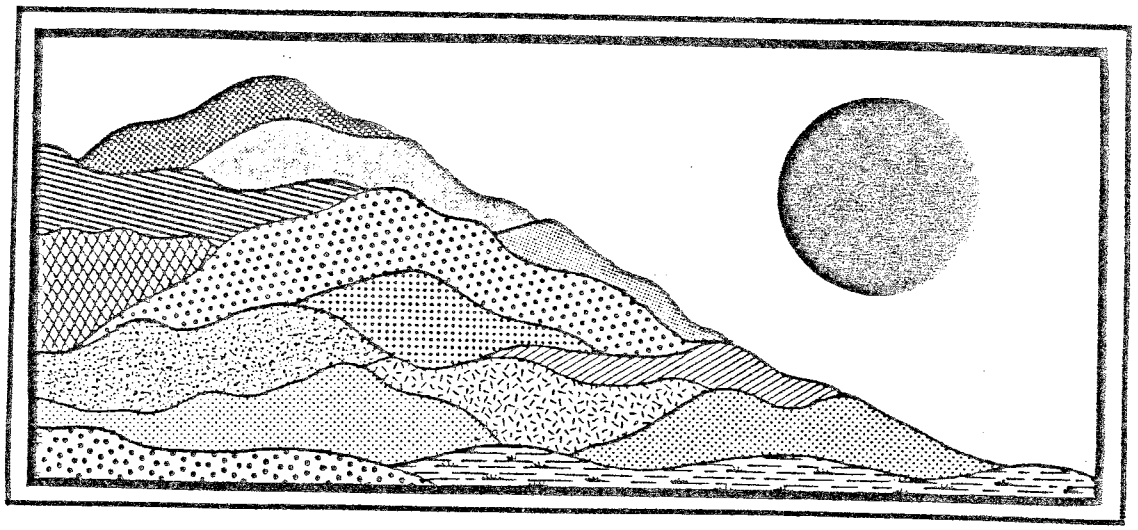
Kenilworth VI

Clinton, Connecticut

February 1987



ENVIRONMENTAL REVIEW TEAM REPORT

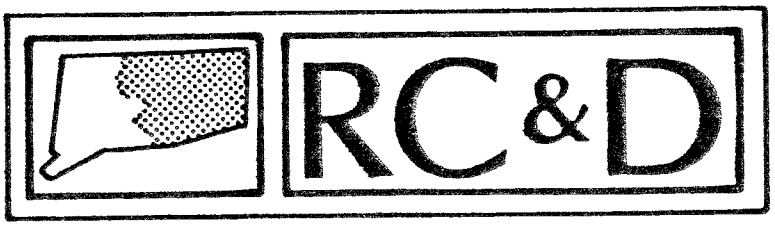
EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

Kenilworth VI

Clinton, Connecticut

Review Date: JANUARY 8, 1987

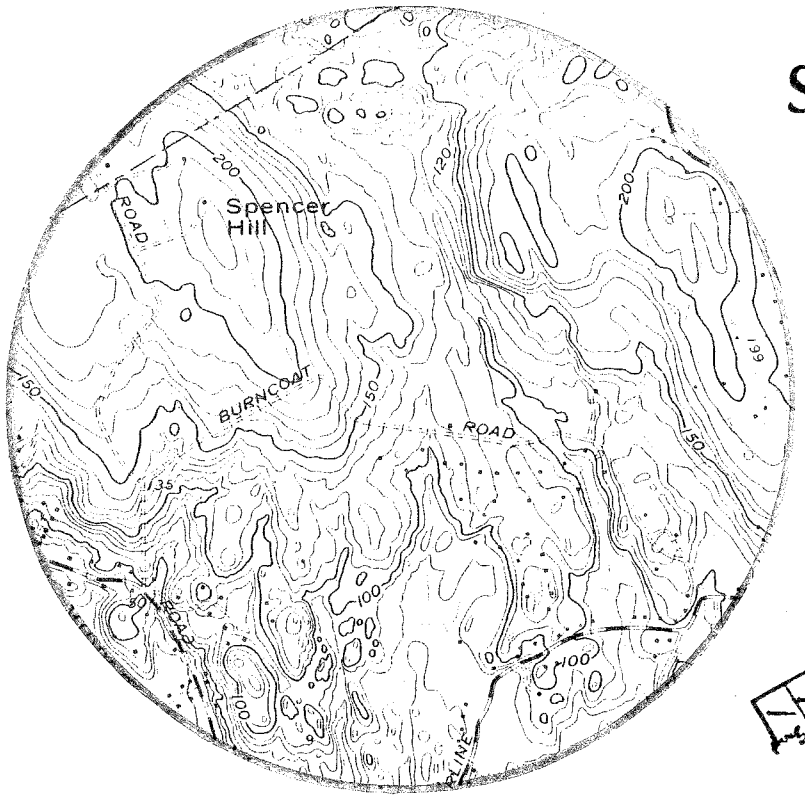
Report Date: FEBRUARY 1987

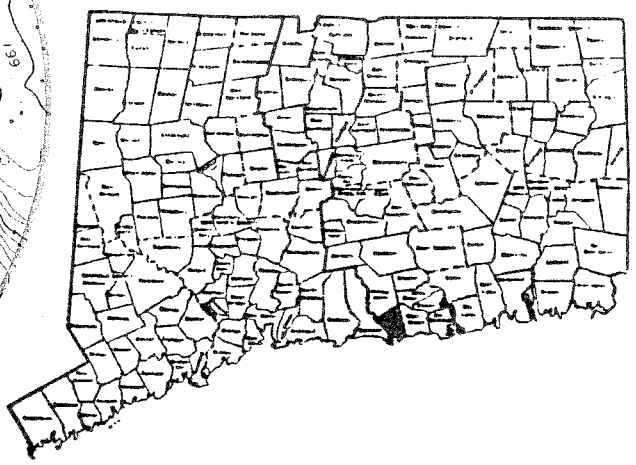


ENVIRONMENTAL REVIEW TEAM
PO BOX 198
BROOKLYN, CONNECTICUT 06234

Site Location

KENILWORTH VI SUBDIVISION
CLINTON, CONNECTICUT





EASTERN CONNECTICUT

RESOURCE CONSERVATION

& DEVELOPMENT AREA

ENVIRONMENTAL REVIEW TEAM REPORT
ON
KENILWORTH VI
CLINTON, CONNECTICUT

This report is an outgrowth of a request from Clinton Planning and Zoning Commission to the Middlesex County Soil and Water Conservation District (S&WCD). The S&WCD referred this request to the Eastern Connecticut Resource Conservation and Development (RC&D) Area Executive Committee for their consideration and approval. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

The ERT met and field checked the site on Thursday, January 8, 1987. Team members participating on this review included:

Don Capellaro	Sanitarian - Connecticut Department of Health
Tom Ladny	Soil Conservationist - U.S.D.A., Soil Conservation Service
Al Roberts	Soil Resource Specialist - U.S.D.A., Soil Conservation Service
Richard Serra	Regional Planner - Connecticut River Estuary Regional Planning Agency
Elaine Sych	ERT Coordinator - Eastern Connecticut RC&D Area
Bill Warzecha	Geologist - DEP, Natural Resources Center

Prior to the review day, each Team member received a summary of the proposed project, a list of the Town's concerns, a location map, a topographic map and a soils map. During the field review the Team members were given site plans. The Team met with, and were accompanied by the Town Planner, the Director of Health, the Town Sanitarian, a Planning and Zoning member, the applicant's engineer and surveyor. Following the review, reports from each Team member were submitted to the ERT Coordinator for compilation and editing into this final report.

This report represents the Team's findings. It is not meant to compete with private consultants by providing site designs or detailed solutions to development problems. The Team does not recommend what final action should be taken on a proposed project--all final decisions and conclusions rest with the Town and landowner. 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 developer and the Town. The results of this Team action are oriented toward the development of better environmental quality and the long-term economics of land use.

The Eastern Connecticut RC&D Executive Committee hopes you will find this report of value and assistance in making your decisions on this proposed subdivision.

If you require any additional information, please contact:

Elaine A. Sych
ERT Coordinator
Eastern Connecticut RC&D Area
P. O. Box 198
Brooklyn, CT 06234
(203) 774-1253

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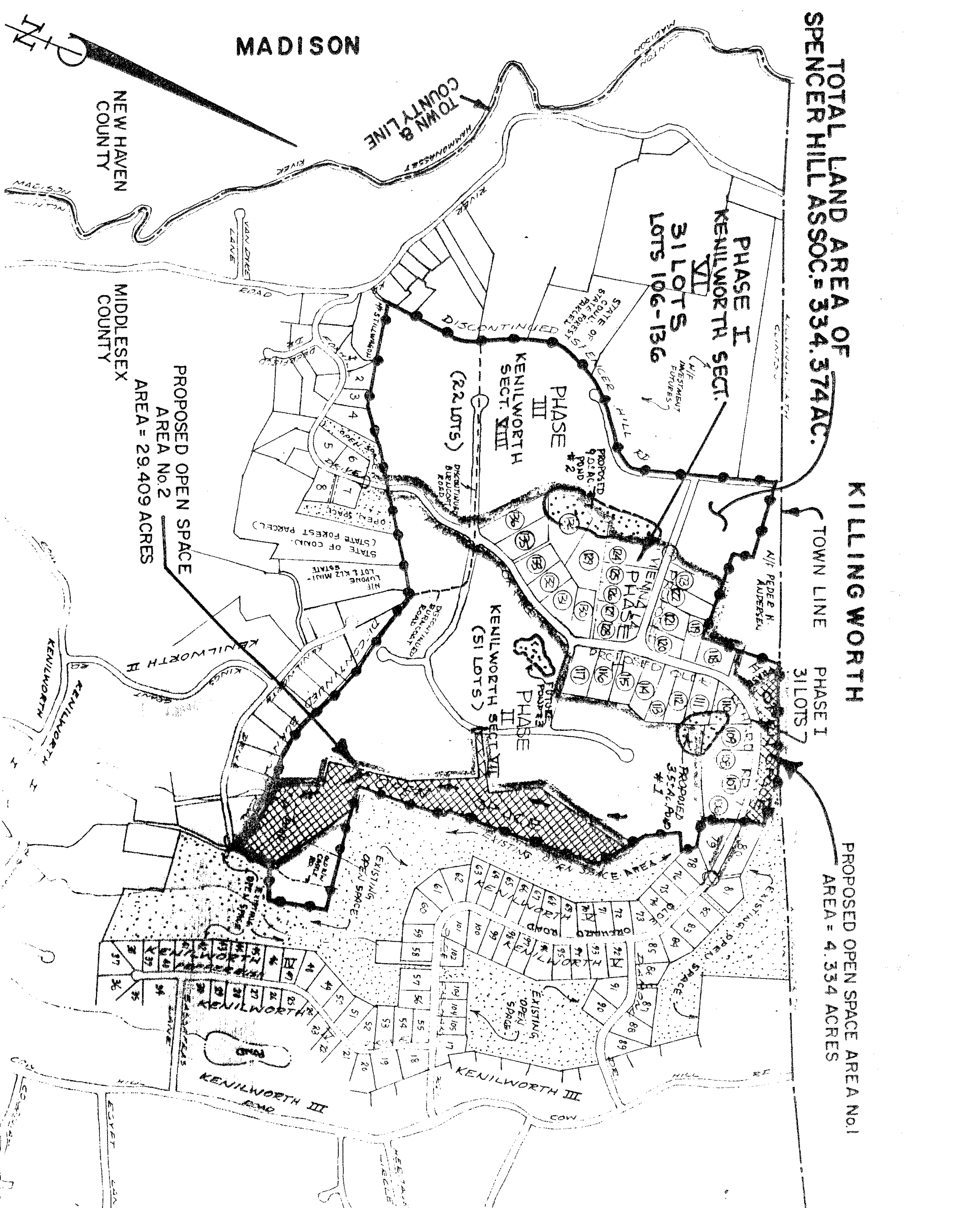


TOTAL LAND AREA OF
SPENCER HILL ASSOC.= 334.374 AC.
MADISON
KILLINGWORTH
TOWN LINE
TOWN & COUNTY LINE
NEW HAVEN COUNTY
MIDDLESEX COUNTY
HAMMONASSET RIVER
PHASE I
KENILWORTH SECT. VII
31 LOTS
LOTS 106-136
PHASE III
KENILWORTH SECT. VIII
(22 LOTS)
PHASE II
KENILWORTH SECT. VII
(51 LOTS)
PHASE I
31 LOTS
DISCONTINUED SPENCER HILL RD
STATE OF CONN. STATE FOREST PARCEL
N/F INVESTMENT FUTURES
N/F PEDER H. ANDERSEN
N/F LUPONE LOT & KLZ MINI-ESTATE
PROPOSED 9.0 AC. POND #2
PROPOSED 3.5 AC. POND #1
FUTURE POND #3
DISCONTINUED BURNT COAT ROAD
PROPOSED OPEN SPACE AREA No.2
AREA = 29.409 ACRES
PROPOSED OPEN SPACE AREA No.1
AREA = 4.334 ACRES
EXISTING OPEN SPACE AREA
EXISTING OPEN SPACE
KENILWORTH II
KENILWORTH III
KENILWORTH IV
ORCHARD ROAD
COW HILL RD
KENILWORTH III ROAD
VAN DYKE LANE
POND

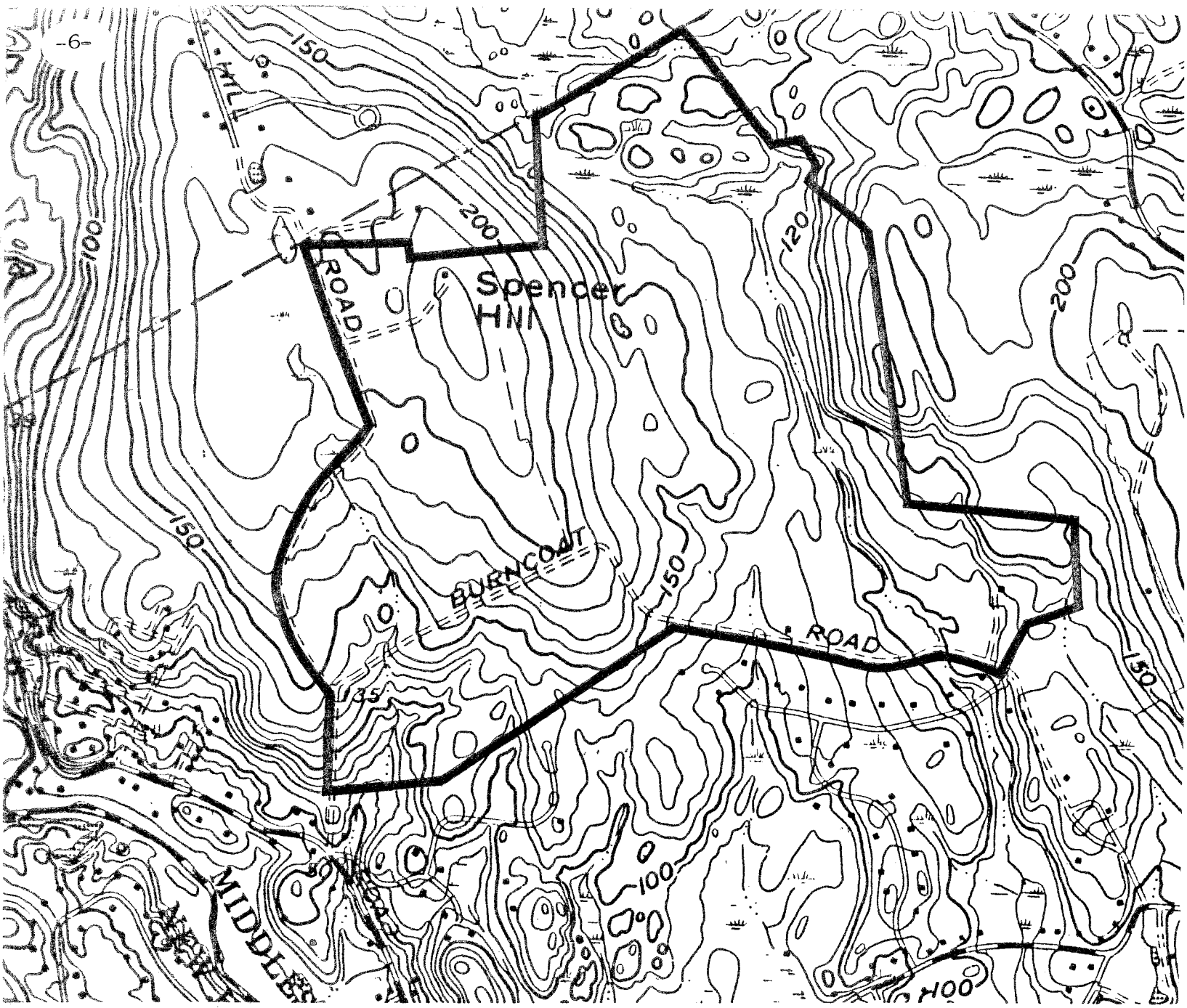
1. Introduction

The Eastern Connecticut Environmental Review Team has been asked to perform an environmental review for a proposed subdivision. This report for Section VI of the Kenilworth Subdivision, Phase I is reviewed in detail.

The total acreage of the property in question consists of about 335 acres which adjoins the Killingworth town line at the north and is a relatively short distance from the Madison town line which is toward the west. The main focus of the parcel is Spencer Hill. The property would be developed in various phases (1-3) with a projected overall total of 104 lots. The initial phase of Section VI of the development would be for 31 lots on about 74 acres. Essentially the lots would be developed off the continuation of the roadway which currently terminates at cul-de-sacs on Olde Orchard Road and Foxhill Drive. Adjacent easterly land of the Olde Orchard Road cul-de-sac is part of earlier sections of the Kenilworth Subdivision which has or is in the process of being completed. Some of these earlier sections were apparently developed under a clustering concept utilizing smaller lots. Lots in the present proposal would be in a 2 acre zone. The site is predominately wooded although there are several open fields and an existing house at the upper north side. Also, it is apparent that the approximate location for new roadways in the subdivision have been cleared of trees and rough graded. Several pond sites are also proposed being surmised as a source of fill material, retention basins for storm water runoff, fire protection, and for general aesthetic purposes. Spencer Hill has several elongated areas of wetland soils in drainageways or watercourses which drain in a southerly direction. They eventually join the Hammonasset River either directly or by first flowing into surface bodies of water such as ponds and Boulder Lake.

2. Topography and Geology

The ± 334 acre subdivision site is located on Spencer Hill in the northwestern corner of Clinton. Except for a ± 7 acre and a ± 1 acre open field in the northwest corner, the site consists of wooded land. Spencer Hill is a surficial geologic feature known as a "drumlin". Drumlins are hills composed of glacial sediment (till), which was deposited directly from an ice sheet and which was simultaneously or subsequently overridden and streamlined by the ice. The Spencer Hill drumlin takes the shape of a cigar. Slopes on the site are mostly gentle with some moderate slopes flanking the east side of Spencer Hill.



TOPOGRAPHY

Approximate Site

1" = 1000'

Several south flowing streams tributary to Hammonasset River are visible on the site. These streamcourses are paralleled by regulated inland-wetland soils.

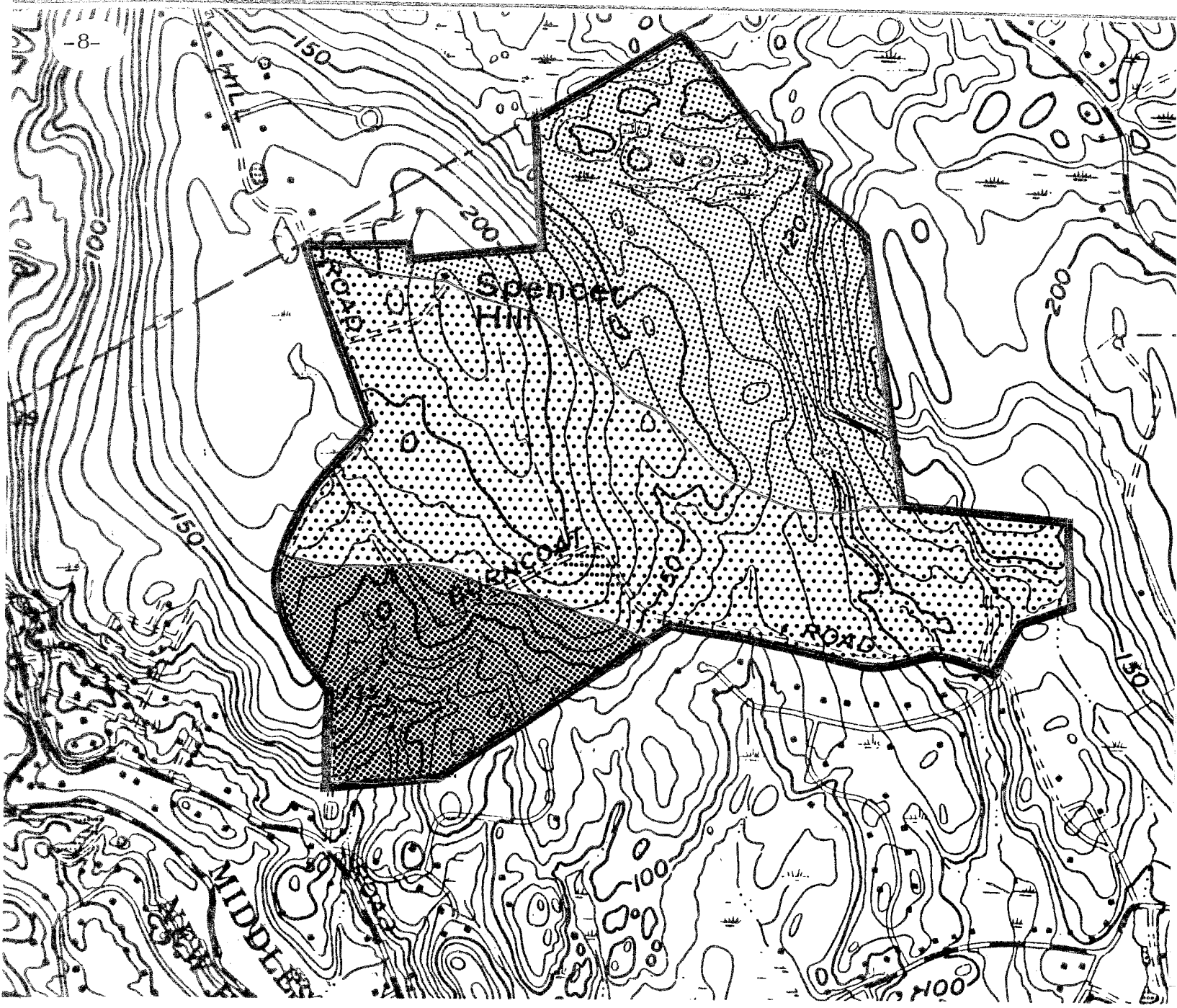
Maximum and minimum elevations on the site are 220 and 100 feet above mean sea level, respectively. The southern end of Spencer Hill affords scenic views of Long Island Sound.

Overlying bedrock throughout the site is a loose to compact glacial sediment known as till. Till consists of rock particles of widely ranging sizes (from clay to large boulders), and shapes (from flat to angular to rounded). Most of this sediment was deposited by lodgement beneath the former ice sheet, but some may have been let down from within or from the surface of the ice as it was wasting during the period of glacial retreat. As a result of these different processes, the upper 2 to 3 feet of the till are commonly sandy and loose while the lower portion is silty to clayey, platey, and compact. Where compact till is encountered, it is commonly called "hardpan". This material is very slowly permeable, so that an intense or extended rain may quickly saturate the upper soil levels. Evidence of this was seen on the review day in monitoring wells, a large trench and a freshly dug deep test hole located in the northwest corner of the property.

The long axis of the hill on which the property is located is oriented in the apparent direction of the former glacier's advance; south-southeast. Water Resources Bulletin 30 (Lower Connecticut River Basin) suggest thicknesses of till on parts of the site may be at least 40 feet. (Reference; Surficial Geologic Map of the Clinton Quadrangle, Connecticut Map QR-28, by R. F. Flint and deep test hole data for sub-surface sewage exploration supplied by the project engineer).

A bedrock geologic map (Map QR-29, by L. Lundgren and R. F. Thurell) for the Clinton quadrangle, in which the site lies, has been published by the U. S. Geological Survey. QR-29 identifies three (3) rock types underlying this site: Middletown Gneiss and two subunits of Monson Gneiss.

Middletown Gneiss, which underlies the northeastern third of the site consists of interbedded amphibolitic (rocks rich in mineral of the amphibole group, i.e., plagioclase) and rust stained gneisses composed largely of plagioclase. The minerals gedrite, garnet and cummingtonite may or may not be present in some of the layers of the gneisses. Gneisses are crystalline metamorphic rocks (rocks geologically altered by great heat and pressure) characterized by distinct banding. This banding is caused by thin bands of elongate or flaky minerals which alternate with layers of granular minerals.

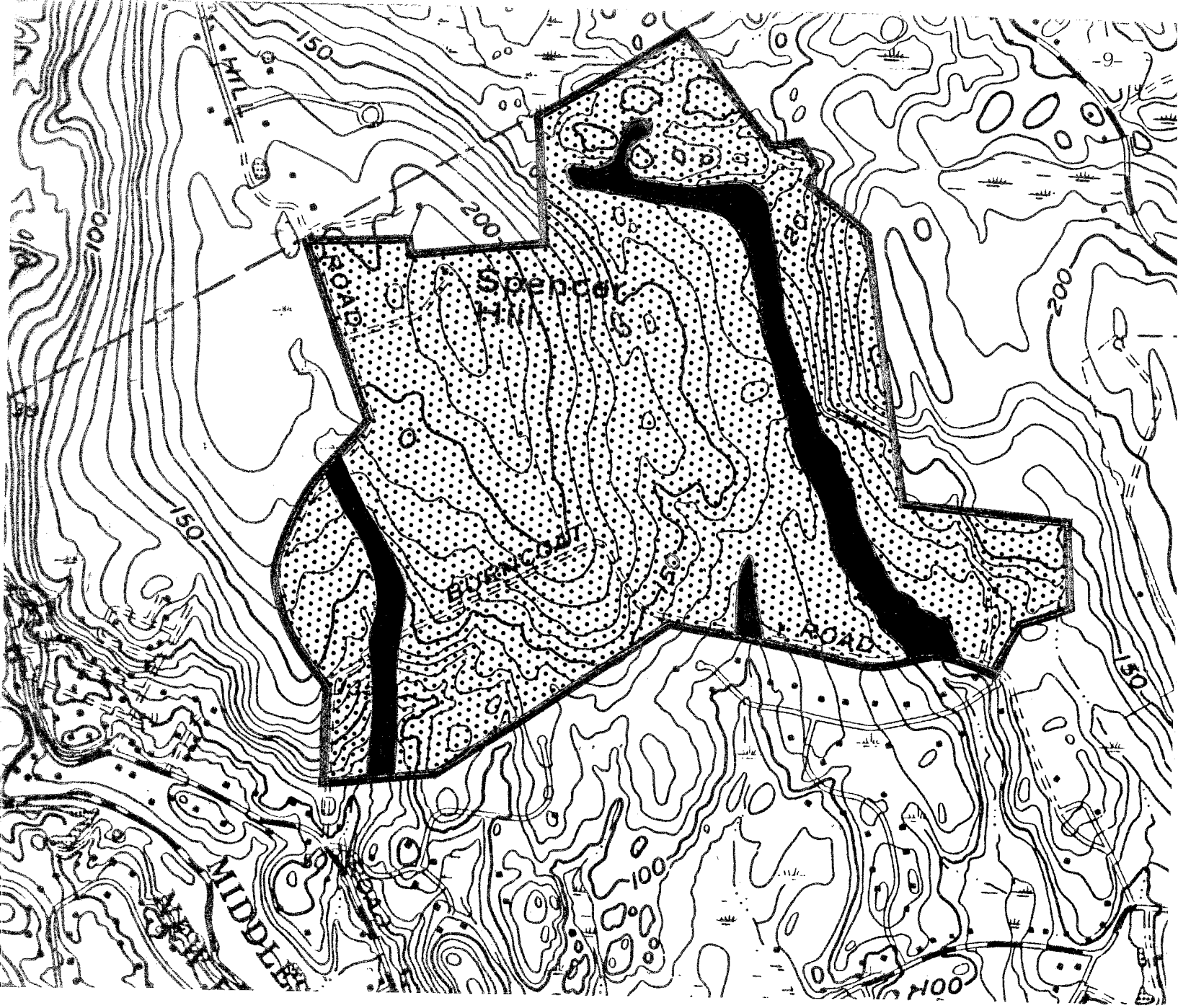


BEDROCK GEOLOGY

Middletown Gneiss

Monson Gneiss*
*See section 2. in report for detailed description.

1" = 1000'



SURFICIAL GEOLOGY

Till

Seasonally Wet Areas

1" = 1000'

The remainder of the site is underlain by subunits of Monson Gneiss. The central parts of the site are underlain by a light to dark-grey gneiss composed of the minerals biotite, plagioclase and quartz. This rock unit may also contain layers of black amphibolite. The southwest corner of this site is underlain by a variety of Monson Gneiss that consists of a dark grey hornblendic (hornblende rich) rocks composed mainly of quartz and plagioclase. This rock unit also includes amphibolite inclusions.

The rocks mentioned above are the source of water for many homes in the area and will likely be the water source for the proposed homes. Except for affecting water quality and quantity of drilled wells in the proposed subdivision, the underlying bedrock should pose little or no problems in terms of the proposed activity. (See Water Supply Section.) There were a few deep test holes that revealed possible shallow bedrock. Shallow to bedrock conditions can be problematic in terms of on-site sewage disposal. Areas suspected of having shallow bedrock should be retested to ensure adequate depths. (See Geologic Development and Concerns Section.)

3. Soils

The included soil map from the Middlesex County Soil Survey Report shows the approximate areas of soils over this parcel. The wetland soils were mapped in more detail by a private soils consultant and have been superimposed over the proposed plot plan.

On Monday, October 27, 1986, Pat Leavenworth, the Middlesex District Conservationist and Al Roberts, SCS, Soil Resource Specialist walked over most of this site to inspect wetland soil boundaries delineated and flagged in the field. In a trip report to Pat on November 6, 1986, Al remarked that "a good effort was made by the consultant to locate and flag all wetland soil areas. They could not verify if wetland flags were surveyed accurately onto the plot plan because they were unable to read the flag numbers on the plan."

The landscape over this site is mostly drumloidal. Slopes range from sloping to steep with several areas of short, very steep slopes. The soils are well drained to poorly drained and have a dense substratum commonly referred to as "hardpan". The soils listed below are fairly evenly distributed over this parcel of land. They are:

CrC - Charlton-Hollis very stony fine sandy loams, 3 to 15 percent slopes.
Lg - Leicester, Ridgebury, and Whitman extremely stony fine sandy loams.

United States Department of Agriculture

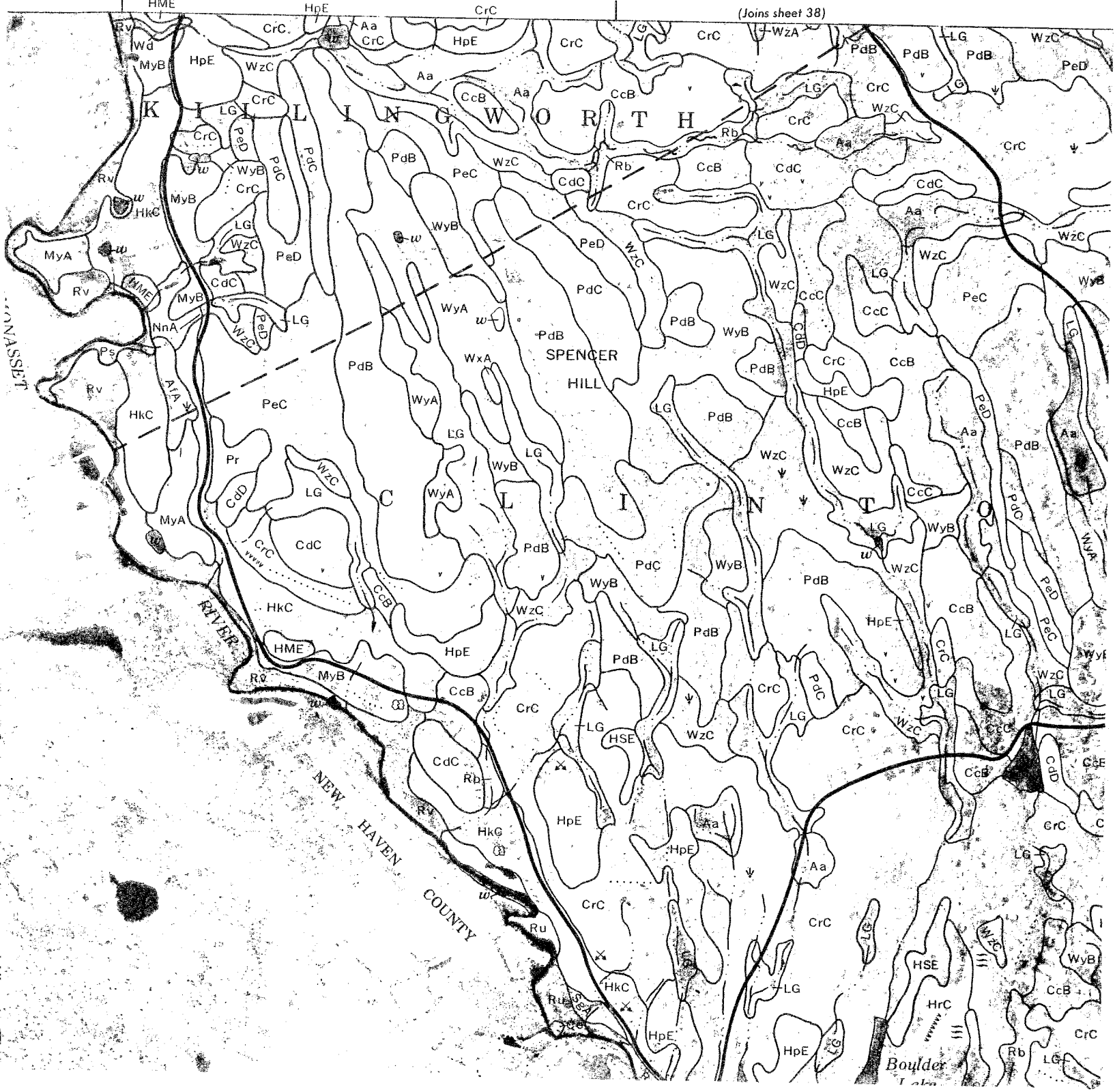
Soil Conservation Service

Middlesex County USDA-SCS
Middlesex County Extension Center
Haddam, CT 06438
345-3219

Scale 1" = 1320'

N

MIDDLESEX COUNTY, CONNECTICUT — SHEET NUMBER 42



PdB - Paxton and Montauk very stony fine sandy loams, 3 to 8 percent slopes.
PdC - Paxton and Montauk very stony fine sandy loams, 8 to 15 percent slopes.
WyB - Woodbridge very stony fine sandy loam, 3 to 8 percent slopes.
WzC - Woodbridge extremely stony fine sandy loam, 3 to 15 percent slopes.

The main soil limitations on this site are slow permeability in the hardpan, slope and depth to a seasonal high water table.

The Charlton-Hollis mapping units consist of gently sloping and sloping well drained and somewhat excessively drained soils on ridges where relief is effected by the underlying bedrock. Permeability of these soils is moderate or moderately rapid. This complex is about 50 percent Charlton soils, 30 percent Hollis soils, and 20 percent other soils with some bedrock outcrops. The soils of this complex are in such an intricate pattern that it was not practical to map them separately. However, on this landscape and for the proposed use, areas of the deep Charlton soil can be found by explorations with a backhoe.

Charlton soils usually have more than 60 inches of loamy material over bedrock. Hollis soils may have bedrock within 20 inches of the surface. The included soils in this map unit can be any of the similar soils commonly associated on this type landscape. They may range from well drained to poorly drained or have other restricted features such as dense substratums and/or slow permeable layers below the surface.

The Leicester, Ridgebury, and Whitman soils consist of nearly level to gently sloping poorly drained and very poorly drained soils in drainageways and depressions. These areas are commonly long and narrow or irregular in shape. The permeability of these soils is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. Areas of these soils are 40 percent Leicester soils, 25 percent Ridgebury soils, 15 percent Whitman soils, and 20 percent other soils. These soil areas are regulated inland wetland soils under Connecticut State Law. The soils are ponded or have very high water tables for most of the year. Additional information on these soils may be obtained from the Soil Survey of Middlesex County.

Paxton and Montauk are gently sloping to sloping well drained soils on drumlins and glacial till plains. Permeability is moderate in the surface layer and subsoil and slow to very slow in the substratum. Areas of these soils are about 40 percent Paxton soils, 40 percent Montauk soils, and 20 percent other soils. These soils were mapped together because there is no significant difference that affects their use and management.

Paxton and Montauk soils have a firm substratum from depths of 15 inches to depths greater than 60 inches that causes slow to very slow permeability. This substratum or hardpan as it is commonly referred to, may restrict the flow of sewage effluent enough that the State Health Department can consider these soil areas "areas of special consideration". Soil percolation rates should be taken and studied in these soil areas. A seasonal water table is perched above the hardpan for a short time in the spring.

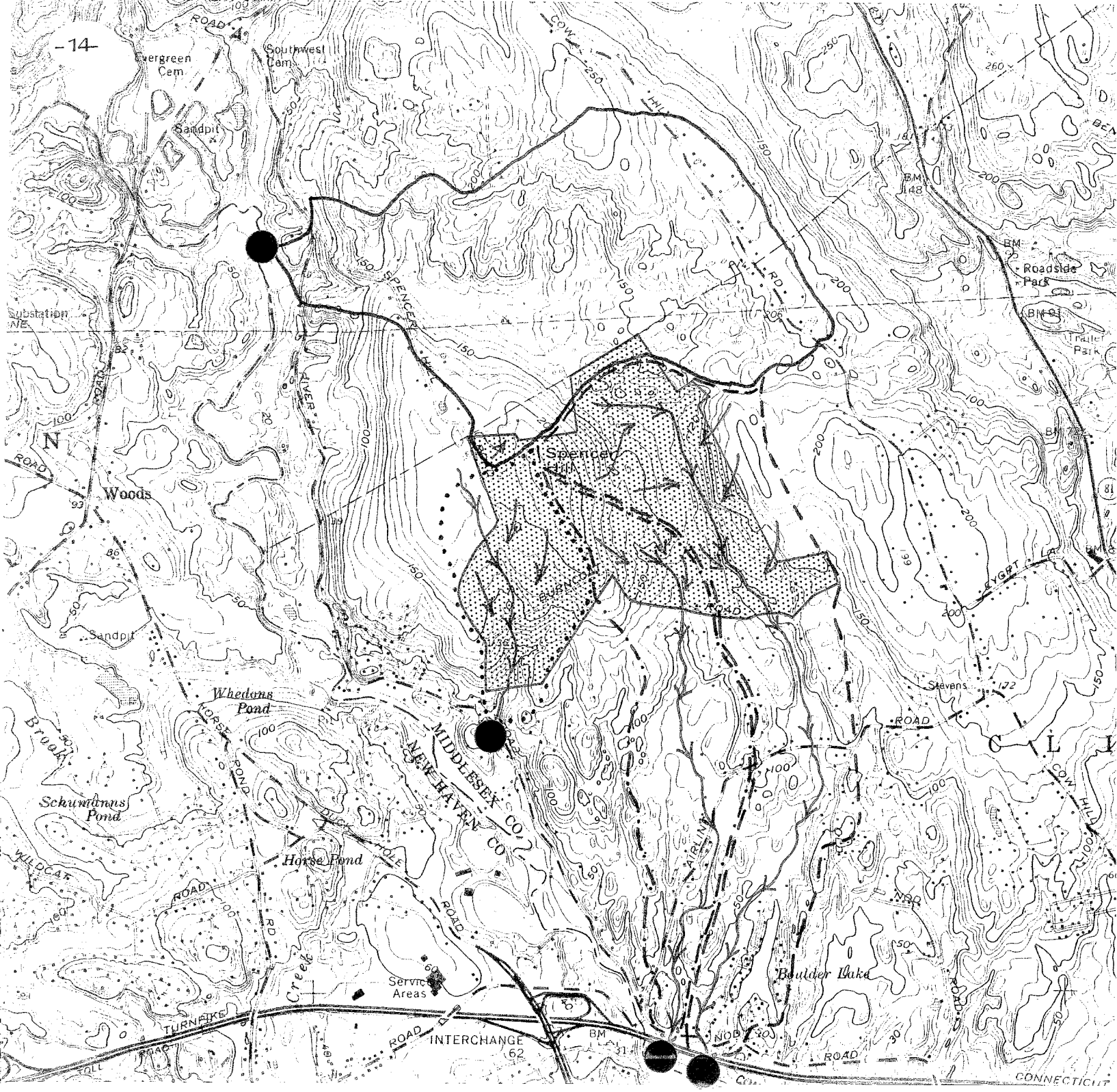
Included soils in these mapped areas can be any of the similar soils commonly associated with Paxton and Montauk on this type landscape. These included soils may be well drained with no water table to poorly drained with high to very high water tables. Some included soils may not have the hardpan that is common in the Paxton and Montauk soils.

The Woodbridge soils are described similar to the Paxton and Montauk soils. However, these soils are moderately well drained with a seasonal water table at a depth of 18 inches from autumn until mid-spring. Slopes of these soils are mostly concave.

Wetness and slow permeability of the soil substratum makes these soils fairly suited to community development. Steep slopes of excavation will slump when saturated. On-site septic systems need careful design and installation and may require filling in some places. Lawns are wet and soggy from the late autumn to mid-spring, and for several days after heavy rainfall. Artificial drains and land shaping help prevent wet basements and lawns.

4. Hydrology

The entire site lies within the watershed of Hammonasset River. Approximately 23 acres in the northeast parts of the site drains to a wetland area to the north which is located in



WATERSHED BOUNDARY

Study Site

Watercourses showing direction of flow

Direction of surface flow

Points of outflow

Subwatershed boundaries within the site

the town of Killingworth. The unnamed outlet stream for the wetland drains westward into the Hammonasset River. Surface runoff for the remainder of the site is drained by three (3) south-flowing seasonal drainageways located at the western and eastern boundaries. Once surface water reaches these drainageways, it is routed ultimately to the Hammonasset River. The sites major wetland areas generally parallel these drainageways.

Development of the site under present plans would be expected to cause some increase in the amount of runoff shed from the site. These increases would arise mainly from the creation of impervious surfaces such as roof tops, driveways, patios, or interior road systems over otherwise pervious soils. Drainage calculations were not available on the review date. As a matter of policy, it is advised that the applicant's engineer formulate a storm water management plan which includes pre- and post-development runoff calculations. Once this information is compiled, it should be carefully reviewed by the Town engineer.

The major concerns of increased runoff include flooding and the potential for streambank erosion. The applicant's engineer has located three (3) potential sites for detention basins. These basins would be constructed to detain runoff from the site so that post-development flows do not exceed pre-development flows. In order to prevent unwanted silt from reaching watercourses, draining the parcel during construction, it may be possible to design the detention basins to function as a sediment basin also. Sediment that accumulates in the basins will need to be removed periodically so that the storage capacity of the ponds is not diminished. All storm drain outlets should include a designed energy dissipator to help protect areas below outlets from gulleying. Design specifications for all storm water control facilities and erosion control devices should be included on the subdivision plan for review by appropriate Town officials.

A thorough erosion and sediment control plan should be required and enforced for each phase of development. The publication Guidelines For Soil Erosion and Sediment Control should be used for guidance. Special attention should be given to the moderately sloping areas on the site.

As mentioned earlier, several seasonally wet areas parallel the intermittent streamcourses on the site, and in some of the flatter areas. They spread out to form topographic lows which are comprised of regulated inland wetland soils. These soils are protected under Public Act 155. Inland wetland soils, deposited after the glacier disappeared from the region, consist of poorly to very poorly drained mineral soils comprised of fine sand, silt and clay and may be interbedded with some organic material.

Surface water is generally present on these soils during the winter and spring months.

Any activity involving the modification, filling or removal of inland wetland soils will require a permit and ultimate approval by the Town's Inland Wetland Commission. Development in areas covered by regulated wetland soil types should be avoided where possible.

Depending on the final plan, inland wetland soils on the site may need to be crossed in order to construct the proposed interior road system, and depending on desired house locations, driveways may also need to cross inland wetland soils. Although undesirable, wetland road crossings are feasible provided they are properly engineered. The road should be constructed adequately above the surface elevation of the wetlands. This will allow for better drainage of the road and also decrease the frost heaving potential of the road. Unstable materials should be removed and replaced by a permeable road base material. Road construction through wetlands should preferably be done during the dry time of the year and should include provisions for effective erosion and sediment control. Finally, culvert(s) should be properly sized and located so as not to alter the water levels in the wetland or cause flooding problems.

5. Sediment and Erosion Control

The soils throughout this development consist primarily of three (3) series: Paxton, Montauk and Woodbridge. They share several characteristics such as stoniness, seasonal high water tables (due to compacted layers or hardpan) and low pH (acid). The application of lime will help alleviate the acidity. Subsurface drains, with suitable outlets, could help to alleviate wet basements, etc. Even with drains, lawns will be wet until late spring. Deep excavations may slump and must be properly shored up.

Suitable management practices for sediment and erosion control include temporary and permanent diversions, siltation basins, artificial drainage and the prompt establishment of vegetative cover. Silt fencing is recommended for installation where long-term use (greater than 2 to 3 months) is needed. It is reusable and can be relocated when that area is stabilized. Properly installed hay bales are most effective in short-term situations and in small drainage areas (less than one acre). After final grading and seeding they can be used for mulch.

With proper installation and periodic maintenance, locating just a minimal number of hay bales or silt fence across shallow drainage channels in key places would be more effective in trapping sediment than surrounding all disturbed areas with a lot of hay bales or silt fence which may not be properly installed or maintained. Small drainageways, driveways or construction entrance ways are common avenues where sediment should be trapped.

The sediment and erosion control plan, as presented, should be expanded in greater detail to correspond with Clinton's zoning regulations (as adopted from Public Act 83-388) dealing with sediment and erosion control. Sediment and erosion control plans for the typical lot situations which would be encountered should be included. Specific information for siltation basins, lime, fertilizer, seeding recommendations, mulching, temporary seeding and stockpiling should be included on the plan. The individual on site who will be responsible for installing and maintaining erosion and sediment controls should be specified on the plan, along with pertinent contact information. Provisions for winter shutdown and information detailing the excavation, dewatering, utilization and stabilization of the material removed during pond construction are also lacking. In brief, the sediment and erosion control plan should be more specific for the benefit of the contractor and the Town zoning enforcement officer. For a project of this complexity and duration, it is suggested that the contractor responsible for implementing the sediment and erosion control plan have a copy of the 1985 Connecticut Guidelines For Soil Erosion and Sediment Control on-site.

6. Wetlands and Pond Construction

Any plans for construction within or affecting wetlands should be submitted to the Town's Inland Wetlands Commission for consideration for a permit to conduct activities affecting wetlands. In this proposal, wetland crossings, drainage outlets and pond construction would qualify as regulated activities requiring a permit.

Three (3) sizeable ponds are proposed for fire protection. Field investigation has determined that the ponds are located at or near the upper reaches of a watershed. They will be dependent on subsurface and surface water for supply. A dry summer will affect both sources of supply; thus the water levels may fluctuate and outflow may cease for periods of time.

The drainage area above a pond must be protected against erosion to the extent that expected sedimentation will not shorten the effective life of the pond. The drainage area shall

be large enough so that surface runoff, groundwater flow or auxiliary means of water supply will maintain an adequate supply of water in the pond. If surface water is the only source of water the ratio of drainage area to normal pond area shall be at least 10 to 1.

All three (3) ponds appear to have drainage ratios less than 10 to 1, and the amount of groundwater recharge is undocumented. The proposed sizes for ponds 1 and 2 seem excessive, and it can be expected that surface evaporation can be larger than recharge, especially during the summer months. For this reason, it is recommended that the pond sizes be reduced to reflect more closely the expected needs of the fire department. For instance, a pond with a surface area of one acre that is one foot deep will hold approximately 325,850 gallons of water. The same pond, but 8 feet deep, will hold over one million gallons of water. How much water does the fire department envision they will need?

It is recommended that pond construction be limited to the flatter sections of the wetland. Where there is a significant slope along its length, such as at pond #2, the pond should be designed to be wider and not as long. If needed, a series of smaller ponds at different elevations could be constructed. Wildlife and safety should be considerations in designing the ponds.

Detailed pond plans need to be developed for review and consideration. These plans should include, but not be limited to, details for size, shape, depth, side slopes, inlet and outlet design, fire truck access, runoff and storage calculations, construction sequence, sediment and erosion control narrative and measures, spoil removal or utilization, and stabilization of all disturbed areas and banks with permanent vegetation. Accessibility, maintenance, safety and liability concerns should be examined and settled by the Town prior to construction.

Flood storage and water retention should also be considered for the overall development. The proposed ponds would have little effect on runoff, due to their location in the upper watershed and development. Runoff calculations for both pre-development and post-development should be prepared, using the SCS TR-55 or TR-20 computer program method, and appropriate retention designed in the lower watershed if the Town feels the impacts are significant.

7. Geologic Development Concerns

The major geologic limitation found on the site is the presence of till soils which have a hadpan or compact layer. Because of this restrictive zone, which ranges between 2 and 3 feet below ground surface and has low vertical permeability, the downward movement of groundwater is very slow. During the wet time of year this condition generally results in a high groundwater table above the hardpan layer. Also, because the hardpan is tightly compact, percolation rates used for sizing septic systems are generally moderately slow to slow. A seasonally high groundwater table and potentially slow percolation rates will have greatest impact on the ability to provide adequate subsurface sewage disposal.

In addition, it is advisable to install building footing drains around houses constructed on the hardpan soils to eliminate the chance of wet basements. Depending on septic system and house locations and topographic conditions, building footing drains may be installed in conjunction with curtain drains. Curtain drains, if properly designed, installed and outletted can provide fail-safe protection from seasonal water table interference.

Extensive subsurface exploration of Phase I (Proposed 31 lots) has been performed by Kenny and Steven engineers. The work involved deep test holes, generally 6 to 9 feet deep. They typically encountered a top soil layer, a weathered and rooted subsoil to 2 to 3 feet, and then hardpan. Possible shallow ledge conditions (less than 5 feet below ground level) were reported in a few test holes. Further testing should be conducted on these lots to determine whether or not shallow ledge conditions actually exist. There is a chance that depth of ledge will be an important design constraint in these areas. The subsurface sewage disposal report prepared by the project engineer indicates that conditions are generally suitable for subsurface sewage disposal. Engineered septic systems would be required on all lots. Geologic conditions on the remainder of the proposed subdivision appears to be similar to Phase I. No subsurface data for these areas were available on the review day. Based on observations made during the field walk, it appears that suitable conditions for engineered septic systems will be found on most of the lots. However, a detailed lot by lot investigation will be required. Such an investigation may result in some rearrangement of lot lines in future phases. (For further sewage disposal information see Section 8).

8. Sewage Disposal

Based on visual observations, soil service mapping data and consideration of preliminary groundwater monitoring data by Town health and engineering representatives, the major constraints for on-site sewage disposal is a high to very high groundwater condition over most of the property. While the soils can be expected to be stony with some boulders, there should be little or no ledge rock of concern. The soils, for the most part, have moderately slow to slow-very slow permeability in the underlying lower compact seasonal groundwater.

Generally where the upper soil layers are underlain with a compact (hardpan) layer, groundwater can usually be controlled by the use of curtain drains and proper surface grading and drainage. In cases where areas for possible sewage leaching systems may have a depth of less than 18 inches of unsaturated natural occurring soil, it would be necessary to demonstrate the effectiveness of groundwater control measures before proceeding with possible other site improvements, such as filling with suitable fill material.

In general where hardpan soils are involved systems should be made large, kept elevated in the better soil layers (at least 18 inches above the maximum groundwater level) and spread out along natural contours as much as possible to enhance the lateral dispersal of effluent.

Because of soil conditions it would be expected that the majority of these lots have severe limitations for sewzge disposal and will require detailed engineering plans for the systems. Continued monitoring of groundwater levels should be made during the wet, spring season. A further consideration should be having access to a drainage outlet (storm sewer, watercourse, wetlands, etc.) for any lot which may have discharges emanating from groundwater control or footing drains.

9. Water Supply

Water for homes in the proposed development would be supplied by private on-site wells. As lots would be large there does not seem to be any particular reason why adequate on-site well supplies could not be constructed. The only suitable aquifer available is bedrock. Yields from bedrock wells depend upon the number and size of water-bearing fractures that are intersected by the wells.

Density and size of fractures in different bedrock types and zones varies widely. According to Connecticut Water Resources Bulletin No. 31, Lower Connecticut River Basin, there would be at least an 80 percent chance that a well at any site could yield at least 3 gallons per minute (gpm) and at least a 50 percent chance that it could yield at least 7 gallons per minute (Source: Connecticut Water Resource Bulletin No. 31). Such yields should prove adequate for the household needs of an average family. In most cases, no more than 150 feet of bedrock should have to be penetrated to obtain these yields. If less than 1 gpm is achieved after drilling through 150 feet of rock, it may be more fruitful to drill in an alternate location than to extend the first well, as the density and size of fractures decreases markedly at such depths. It must be remembered, however, that the 150 feet refers to bedrock only and does not include overburden. In some parts of the site, the overburden alone may be forty (40) feet thick.

A properly located and cased well probably would be safe from effluent contamination on this site. Proper well construction and separating distances in accordance with State Public Health Code, Connecticut Well Drilling Board and Town regulations will allow for adequate protection of the quality of the bedrock aquifer. Natural groundwater quality should be good, although some possibility of undesirably high mineral (particularly iron or manganese) content exists, particularly those wells tapping Middletown Gneiss. Should well water prove to be high in mineral content, several filtration methods are available to overcome such problems. Because of the high concentration of existing and proposed wells in the area, it is recommended that wells be conservatively separated from each other to reduce the chances of mutual interference during pumping periods.

11. Planning Review

This Subdivision proposal would connect "Olde Orchard Road" to "Foxhill Road" and create 104 residential building lots in three (3) phases of development. The first phase of the proposal contains the roadway and 31 lots.

Three (3) ponds are proposed in the project ranging in size from approximately two (2) to nine (9) acres.

The zoning of the area in both Killingworth (rural residential) and Clinton (R-80) is compatible with the density of the proposal.

Due to the steep slope and amount of wetland soils in this area the Regional Plan of Development depicts the area as a "Natural Resource Area".

The Natural Resources characteristics of the area should be addressed to the Commissions satisfaction especially with regard to the installation of on-site septic and water systems, and the construction of the proposed ponds.

The provision on an east-west connector in this section of Town will allow the needed directional access for all vehicle classes, especially for emergency vehicles. The local residential street classification of the proposed road would not be compatible with through commercial traffic use and the layout of the roadway would seem to preclude the practicality of commercial use. Nevertheless it may be appropriate to post this road to prohibit through commercial truck use and/or limit use by weight.

The estimated traffic generated by the proposed phased development would be:*

	TRIPS TO & FROM SITE PER DAY	PEAK A.M.	PEAK P.M.
Phase I 31 Lots	288	23	31
Phase II 51 Lots	474	38	51
Phase III 22 Lots	205	16	22
TOTAL 104 Lots	967	77	104

This trip generation would be in addition to the existing "Olde Orchard Road" and "Foxhill" developments which contain approximately the same number of lots as proposed in the completed Kenilworth VI. Accordingly, the existing residences produce approximately an equivalent number of trips to the area.

For the purpose of review it is anticipated that the daily traffic flow from the site will be fairly evenly split between accessing River Road or Cow Hill Road. It is also anticipated that the majority of traffic flow will be south to access I-95.

There are no existing traffic counts available for either River Road or Cow Hill Road. The generalized capacity of a rural two (2) way street with no parking is estimated to be 1800 vechicles per hour.*

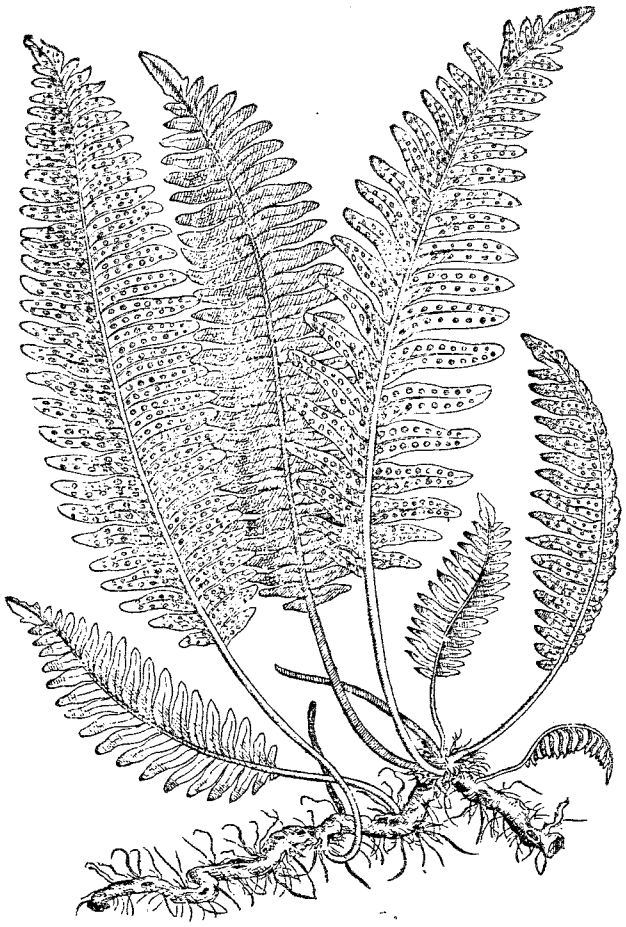
*National Cooperative Highway Research Program Report #187

Field inspection of the River Road/Nod Road/Cow Hill Road network concluded that the geometrics of the network would probably reduce this generalized capacity figure in order to maintain an adequate level of service. The number of vertical and horizontal alignment problems on the roadways cause poor line of sight, and accordingly affect speed and ease of travel.

Review of available accident reports for the period 1979 to 1983 show that 62 local Town roads reported 339 accidents during that time period. Within the affected network, River Road reported 16 accidents. Nod Road reported 29 accidents, and Cow Hill Road 19 accidents. The Nod Road accident number was the highest on local roads in Town. River Road had the sixth highest number of accidents, while Cow Hill Roads' accident number ranked third.

While comparing the estimated trip generation with the generalized road capacity shows excess capacity with a large margin to compensate for the networks poor geometrics. Review of the high accident numbers for local roads seems to indicate that the poor geometrics of the network need to be addressed when introducing additional traffic flow.

It may be appropriate for the Town to conduct a complete traffic study of this proposal to better evaluate the impact upon the network and identify corrective measures.



About The Team

The Eastern Connecticut Environmental Review Team (ERT) is a group of professionals in environmental fields drawn together from a variety of federal, state, and regional agencies. Specialists on the Team include geologists, biologists, foresters, climatologists, soil scientists, landscape architects, archeologists, recreation specialists, engineers and planners. The ERT operates with state funding under the supervision of the Eastern Connecticut Resource Conservation and Development (RC&D) Area--an 86 town area.

The Team is available as a public service at no cost to Connecticut towns.

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 reviewing a wide range of projects including subdivisions, sanitary landfills, commercial and industrial developments, sand and gravel operations, elderly housing, recreation/open space projects, watershed studies and resource inventories.

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 officials of a municipality or the chairman of town commissions such as planning and zoning, conservation, inland wetlands, parks and recreation or economic development. Requests should be directed to the Chairman of your local Soil and Water Conservation District. This request letter should include a summary of the proposed project, a location map of the project site, written permission from the landowner allowing the Team to enter the property for purposes of review, a statement identifying the specific areas of concern the Team should address, and the time available for completion of the ERT study. When this request is approved by the local Soil and Water Conservation District and the Eastern Connecticut RC&D Executive Council, the Team will undertake the review on a priority basis.

For additional information regarding the Environmental Review Team, please contact Elaine A. Sych (774-1253), Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, P.O. Box 198, Brooklyn, Connecticut 06234.