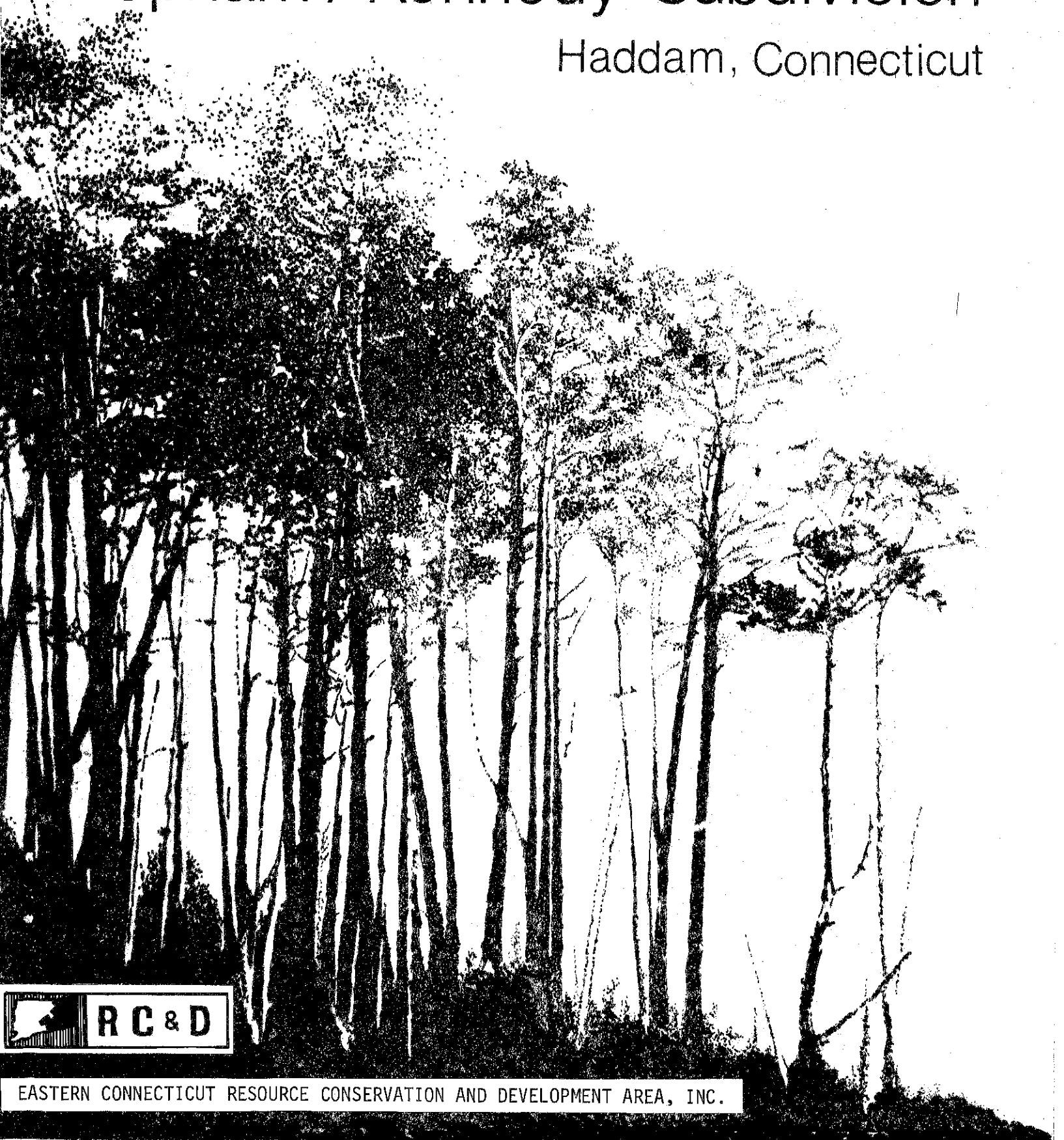


Environmental Review Team Report

Upham / Kennedy Subdivision

Haddam, Connecticut

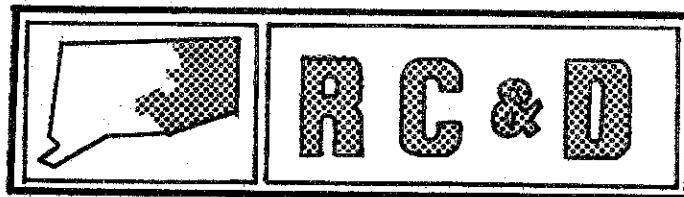


EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

Environmental Review Team
Report
on

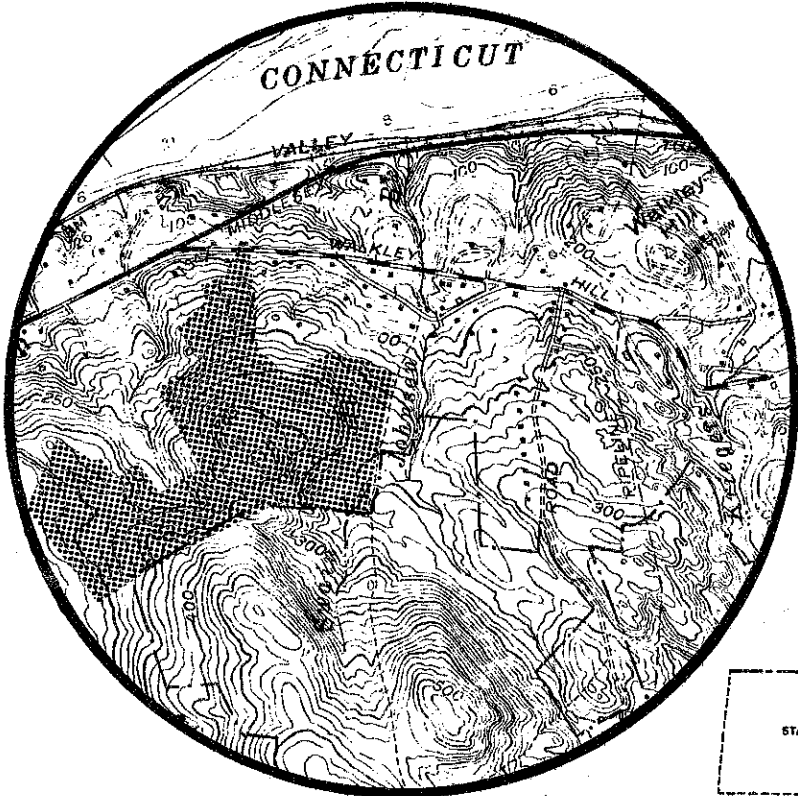
Upham / Kennedy Subdivision
Haddam, Connecticut

July 1978



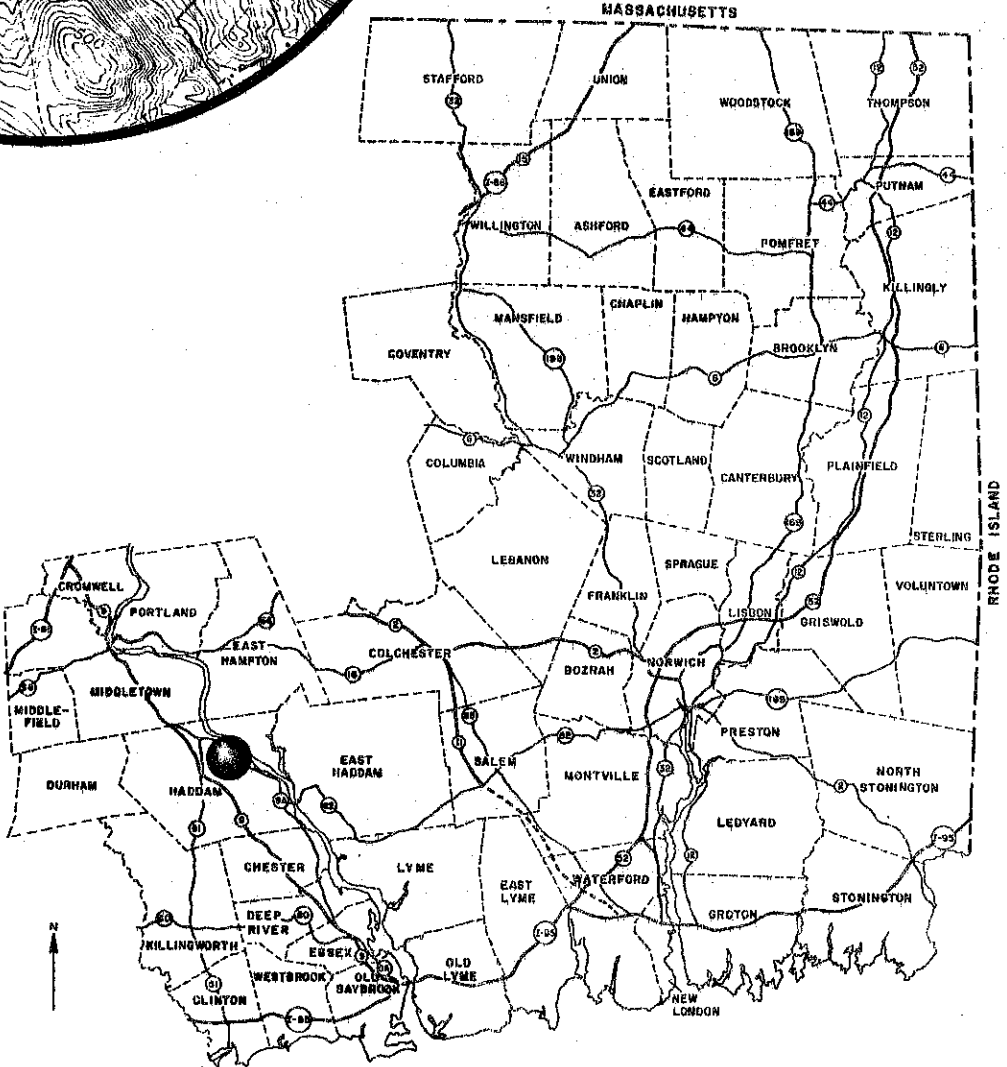
eastern connecticut resource conservation & development area

environmental review team
139 boswell avenue
norwich, connecticut 06360

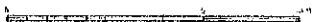


Location of Study Site

UPHAM/KENNEDY SUBDIVISION
HADDAM, CONNECTICUT



EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT



ENVIRONMENTAL REVIEW TEAM REPORT
ON
UPHAM/KENNEDY SUBDIVISION
HADDAM, CONNECTICUT

This report is an outgrowth of a request from the Haddam 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 for the RC&D Executive Committee by David Syme, Committee President, and the measure was reviewed by the Eastern Connecticut Environmental Review Team (ERT).

The soils of the site were mapped by a soil scientist from the United States Department of Agriculture, Soil Conservation Service (SCS). Reproductions of the soil survey map, a table of soils limitations for certain land uses and a topographic map showing property boundaries were distributed to all Team members prior to their review of the site.

The ERT that field-checked the site consisted of the following personnel: Barry Cavanna, District Conservationist, Soil Conservation Service (SCS); Joe Neafsey, Soil Conservationist (SCS); Mike Zizka, Geologist, Connecticut Department of Environmental Protection (DEP); Don Smith, Forester, DEP; Sam Billings, Regional Planner, Connecticut River Estuary Regional Planning Agency; Greg Bonadies, Sanitarian, State Department of Health; Lionel Gardner, Engineer (SCS); and Jeanne Shelburn, ERT Coordinator, Eastern Connecticut RC&D Area.

The Team met and field checked the site on Thursday, February 23 and Monday, May 1, 1978. Reports from each contributing Team member were sent to the ERT Coordinator for review and summarization for the final report.

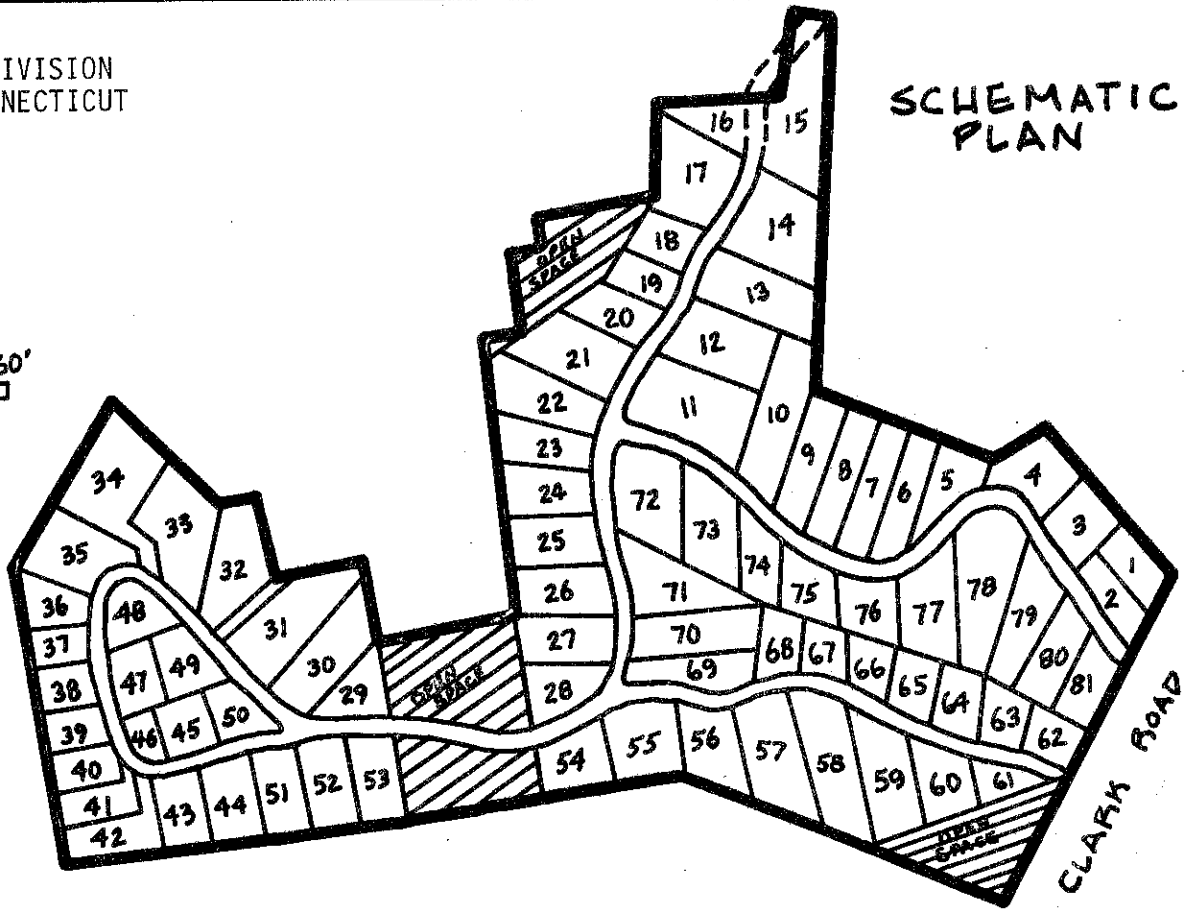
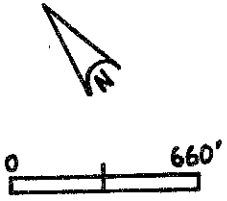
This report is not meant to compete with private consultants by supplying site designs or detailed solutions to development problems. This report identifies the existing resource base and evaluates its significance to the proposed development and also suggests considerations that should be of concern to the developer and the Town of Haddam. The results of this Team action are oriented toward the development of a better environmental quality and the long-term economics of the land use.

The Eastern Connecticut RC&D Area Committee hopes that this report will be of value and assistance in making any decisions regarding this particular site.

If you require any additional information, please contact: Ms. Jeanne Shelburn, Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, 139 Boswell Avenue, Norwich, Connecticut 06360, 889-2324.

UPHAM SUBDIVISION
HADDAM, CONNECTICUT

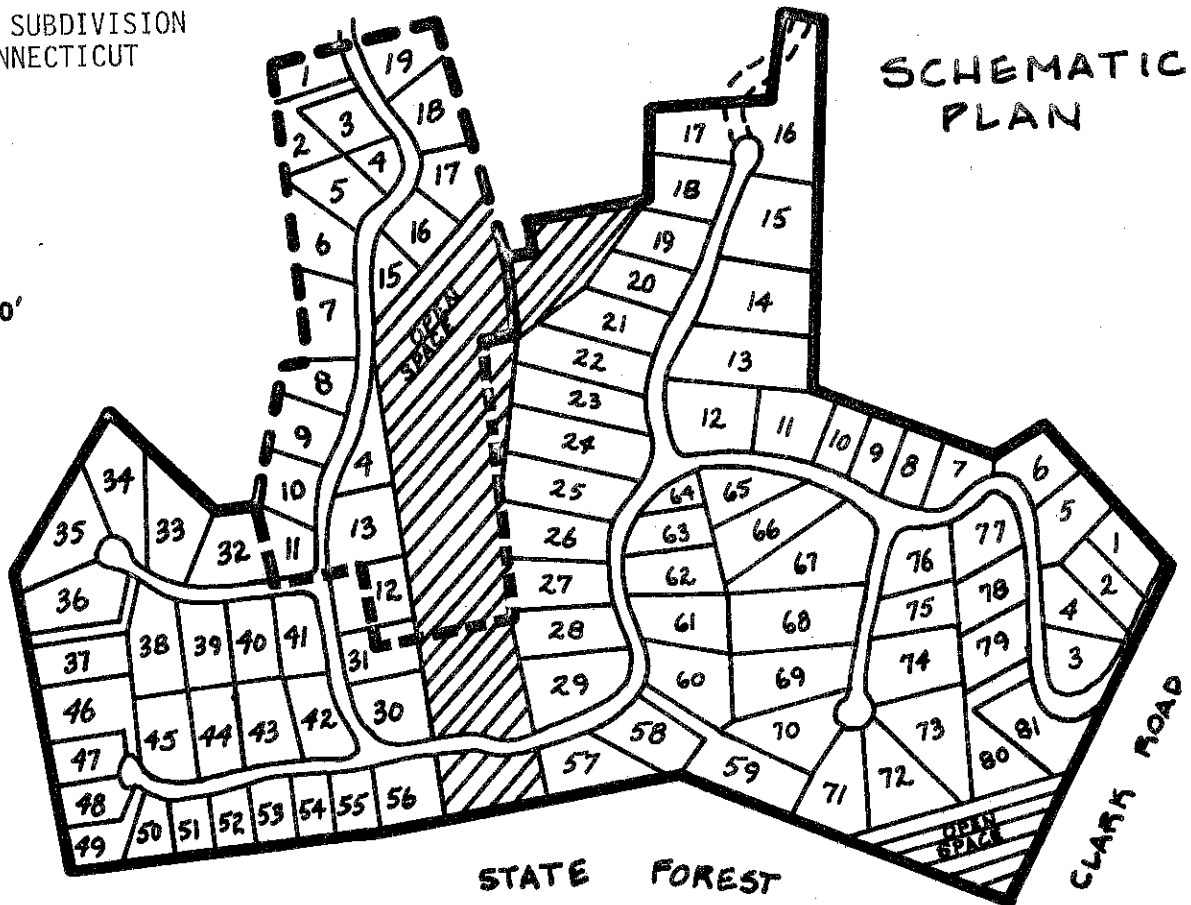
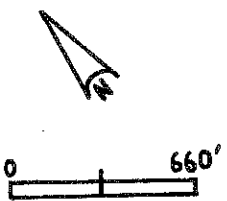
SCHEMATIC
PLAN



All lot lines and road locations shown are approximate.

UPHAM/KENNEDY SUBDIVISION
HADDAM, CONNECTICUT

SCHEMATIC
PLAN



INTRODUCTION

The Eastern Connecticut Environmental Review Team was asked to review for potential subdivision two parcels located on Clark Road, Walkley Hill Road and Middlesex Turnpike in the Town of Haddam. One parcel of 135± acres is currently in the private ownership of Charles Upham, a CosCob resident. The other adjoining 38± acre parcel is owned by Robert Kennedy, a resident of Mercer Island, Washington.

The topography of the Upham-Kennedy site is varied, and typical of the uplands in Haddam overlooking the Connecticut River. The extreme southern portion and the northern third of the site has flat to gently rolling slopes, while the central portion occupying approximately one-half of the site has moderate to steep slopes with 10-15% grades being typical. The soils have moderate to severe limitations for most housing construction purposes due to steep slopes, ledge, wetness or large stones. The vegetation is predominantly deciduous forest with intermittent understory stands of mountain laurel.

All of the Upham-Kennedy site is designated on the Haddam Zoning Maps as a "rural residential zone" which requires at least one acre per building lot. Both the Haddam Plan of Development and the Regional Development Guide of the Midstate Regional Planning Agency propose for the area of the site a minimum of one acre per building lot without service from municipal water or sewage systems. The Gateway Conservation Zone includes approximately the eastern third of the site. The subdivision activities described by Mr. Upham are permitted in the Conservation Zone.

Briefly, Mr. Upham intends to subdivide the parcels in the manner shown in the accompanying illustration. One proposal includes 81 lots on 135± acres with access from Clark Road, the other includes the use of the Kennedy property, allowing for 100 lots on 173± acres with access on Clark Road and Middlesex Turnpike. These lots would be serviced by on-site septic systems and on-site wells. Both of these alternatives are very intensive uses of a site with major physical constraints to development.

In attempting to gain maximum utilization of the property within the zoning regulations, the subdivision plan proposes placing utilities and structures in areas both of very poor and of good characteristics for site development. Either increasing lot sizes significantly or grouping lots in areas of the site with the fewest constraints would allow greater flexibility to deal with the problems created by steep slopes, poor soils and ledge.

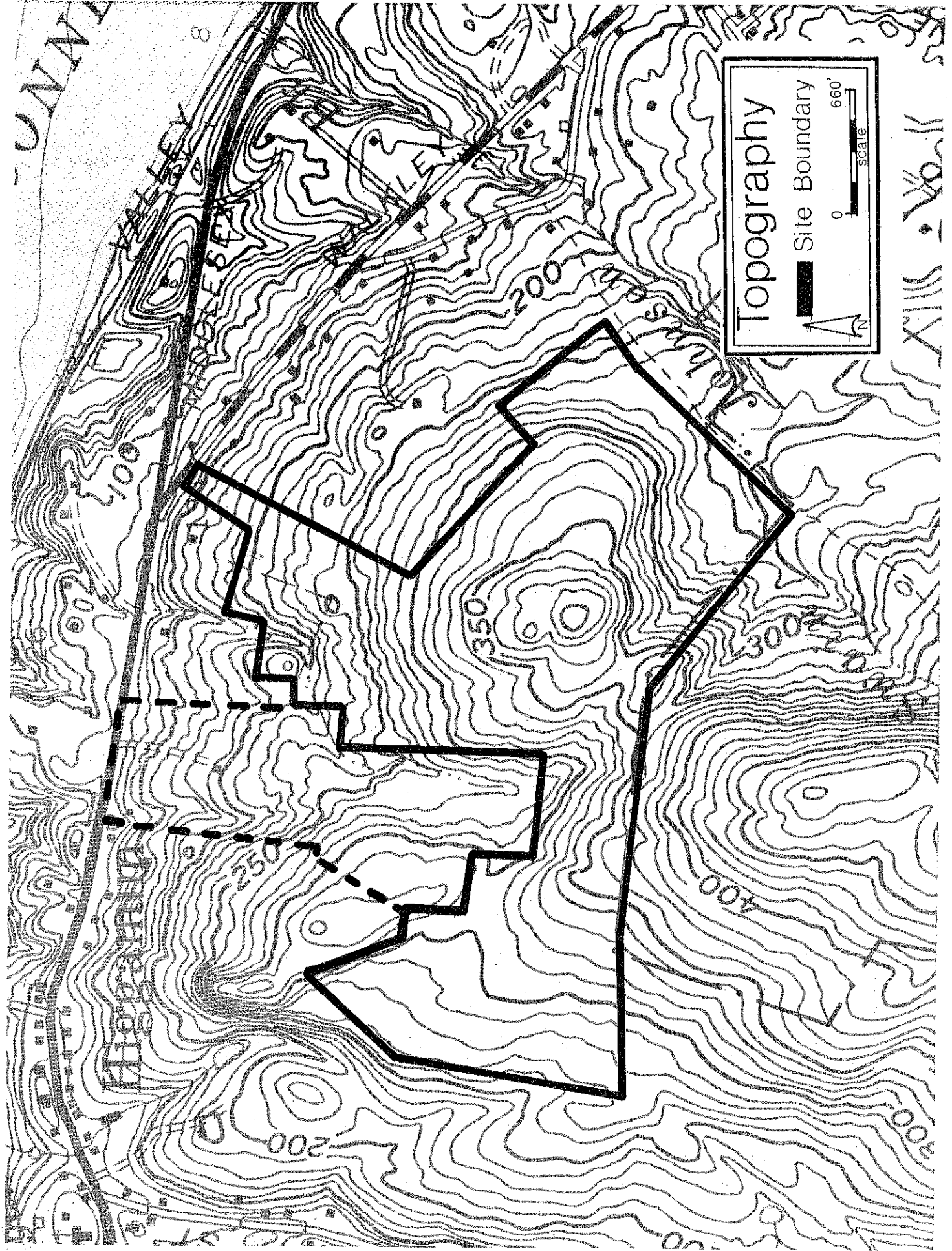
Mr. Upham has expressed his intention to allow minimum disruption of the environment during construction. He also intends to have architects design specific homes for each site, tailoring the architecture of the home to the topography of each lot. These plans would then be sold in conjunction with the property to assure a well designed, environmentally sensitive development, according to Mr. Upham.

The draft Housing Element of the Midstate Regional Planning Agency points out a need for 399 additional housing units in Haddam between 1976 and 1980 to meet the 1980 anticipated town population. The majority of this need is among middle income families. This proposed subdivision plan, with its expensive site develop-

ment costs would provide housing probably for middle to upper income groups.

The Team recommends that the subdivision of the property into lots be based on the suitability and adequacy of specific areas within the site for subsurface sewage disposal systems, and on the availability and quality of individual water supply wells, rather than on the convenience of siting the lots or providing a maximum number of lots for economic purposes. Moreover, the location of houses within each approved lot should be contingent upon the careful and selective placement of wells and septic systems. The environment of the site necessitates giving the utmost consideration to the total interrelationship of topography, soil conditions, septic systems, and water supply.

A plan indicating lots which have suitable areas for septic systems and wells should be submitted for evaluation before a subdivision plan is approved for this site. The potential of this property to support the densities proposed is highly questionable. The majority of the area has severe limitations due to bedrock and steep slopes. Road construction costs would also seem to be a major obstacle to any development in these areas.

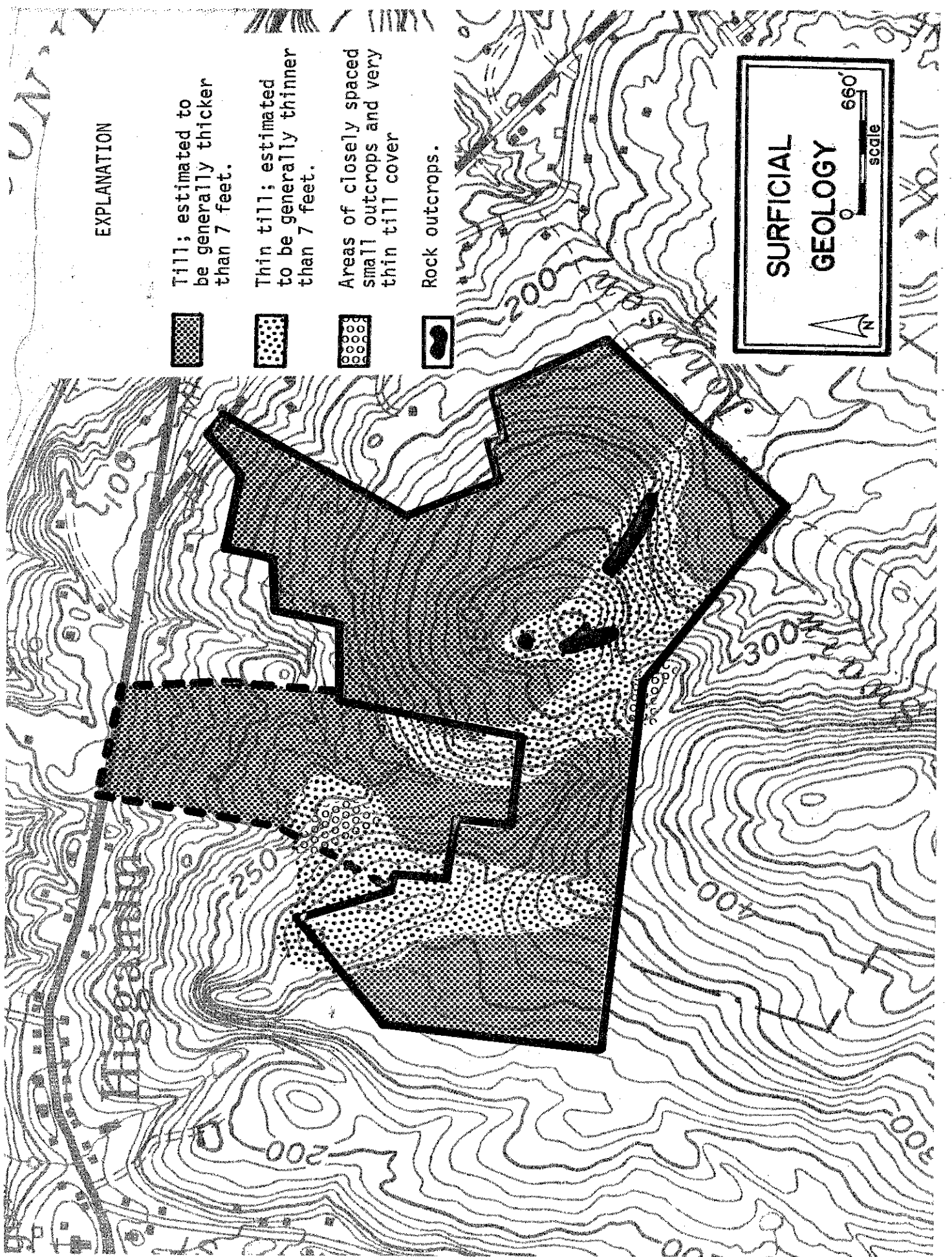


Topography

Site Boundary

0 660' scale

▲



EXPLANATION

Till; estimated to be generally thicker than 7 feet.

Thin till; estimated to be generally thinner than 7 feet.

Areas of closely spaced small outcrops and very thin till cover

Rock outcrops.



SURFICIAL
GEOLOGY

660' scale

ENVIRONMENTAL ASSESSMENT

GEOLOGY

Bedrock underlying or cropping out on the Upham and Kennedy properties is Monson Gneiss, a formation that consists of gray quartz-plagioclase gneisses and amphibolites. The surficial geologic material covering both properties is till, a deposit that was laid down by glacier ice and that consists of rock fragments ranging in size from clay to boulders. Bedrock and surficial geologic maps of the Haddam quadrangle, an area which includes the proposed subdivision, are on open-file at the Natural Resources Center of the Department of Environmental Protection in Hartford.

The depth of the till on the properties is variable. Bedrock occurring near the surface may pose severe development problems. Areas of most concern are shown in Figure 1. Outcrop areas that are shown include only those which are large enough to be delineated at the scale of the map and which were actually observed during field reviews. Many outcrop areas may exist on the properties that are not indicated on Figure 1.

The texture of the till also is variable. A few shallow excavations on the Upham property exposed a very sandy till: some layers approached the consistency of clean beach sand. Other excavations showed a siltier, more bouldery till. It seems likely that most of the till in this area is relatively sandy and loose, as the underlying bedrock, from which much of the till probably was derived, is a granular type, rich in quartz.

TOPOGRAPHY

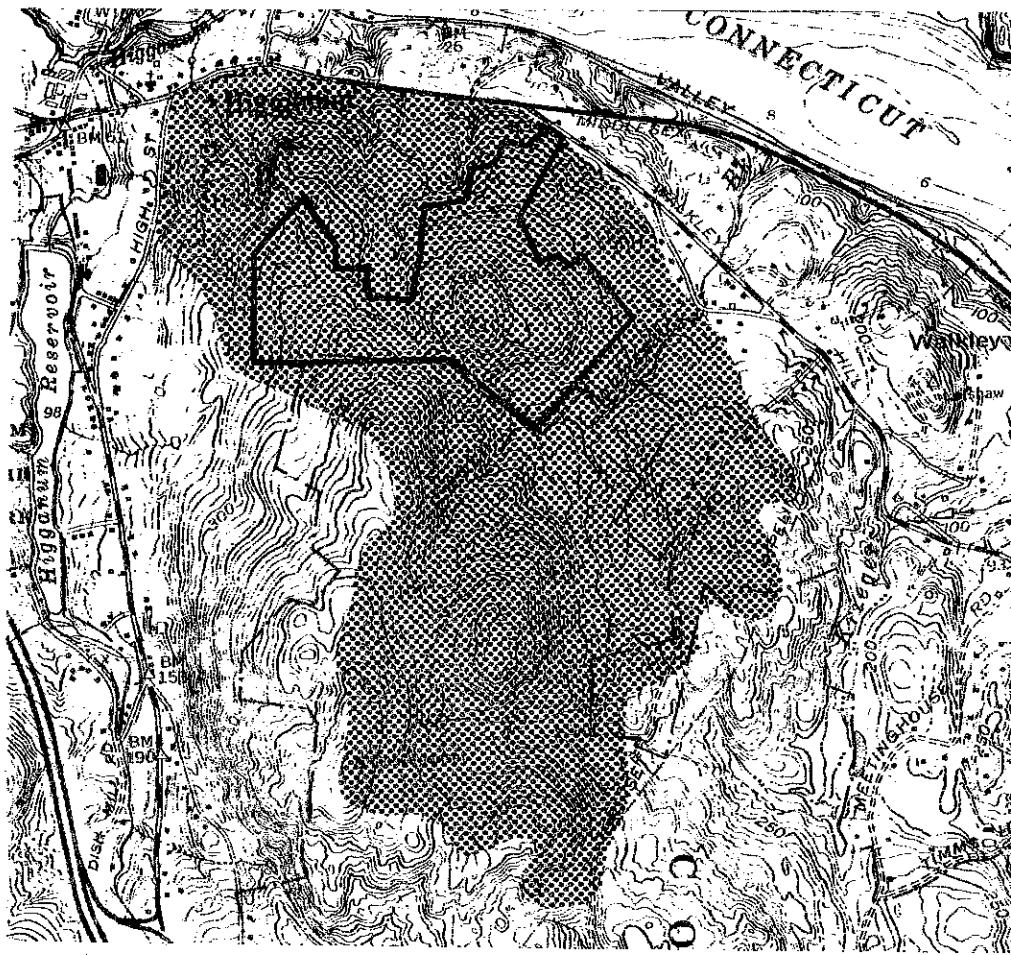
Much of the northeastern and part of the southwestern sections of the Upham parcel have a fairly smooth, but moderate to steep, slope. Irregular topography characterizes the Kennedy parcel and the southeastern section of the Upham parcel. In these areas, the slope is often very steep and is influenced by the knobby bedrock surface that closely underlies or crops out on the land.

HYDROLOGY

All runoff from the Upham and Kennedy properties flows ultimately into the Connecticut River. Several small streams, including Swain Johnson Brook, which flows through the southeastern corner of the Upham parcel, presently carry part of this runoff. Development can be expected to increase the amount of runoff from the site for a given rainfall amount and to increase thereby the peak flows in the streams. Factors that may affect the magnitude of the increases include the following:

- (1) the change in land use, including the removal of vegetation and the construction of impermeable surfaces;
- (2) the design and density of storm sewerage in the subdivision;

Figure 2.



Watershed area of streams draining the Upham-Kennedy properties. Roads immediately north of the properties are considered to be the effective downstream boundaries of the watershed.

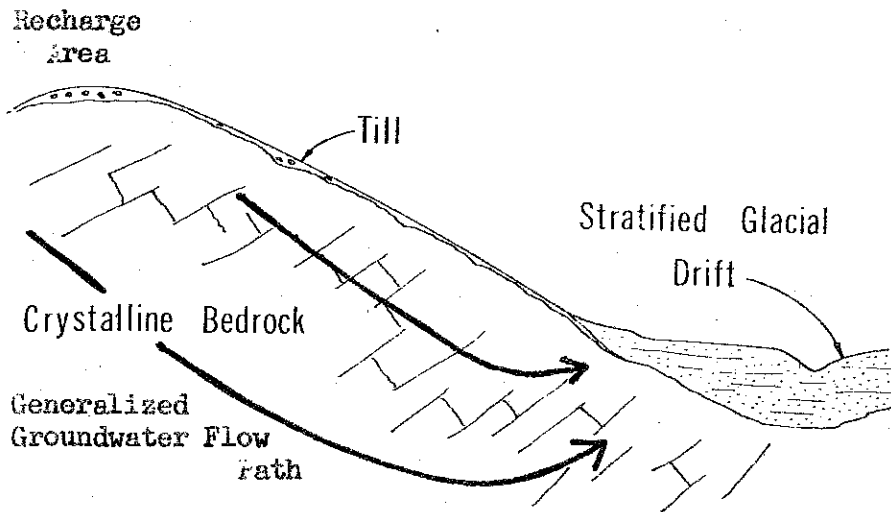


Figure 3.

Schematic diagram of bedrock aquifer recharge area and groundwater flow paths. Modified from Holzer, 1975 (see reference in text).

(3) wastewater discharges, particularly from septic systems.

Although the subdivision plan was not, by itself, sufficient to allow the determination of the effects from storm sewerage or wastewater discharges, an estimate may be made of the runoff change likely to occur from land use modification alone. Technical Release No. 55 of the Soil Conservation Service provides the technique used in formulating the estimate. The method involves the determination of runoff curve numbers, which relate amount of precipitation to amounts of runoff. It is estimated that development would increase the curve number on the properties by 8 (from 65 to 73 if both parcels are included and from 67 to 75 if only the Upham parcel is included). Peak flows in the streams that drain the properties are controlled by a watershed that is larger than the subdivision alone. This watershed, shown in Figure 2, contains approximately 745 acres. If no development occurs in the watershed outside of the proposed subdivision area, the overall runoff curve number would increase by about 1.5. Although no specific runoff volumes can be derived from this estimate, which is actually a simplification of the complete procedure outlined in Technical Release No. 55, it can be demonstrated that the curve number increment could lead to an overall runoff increase on the order of 5 percent. The rise in peak flow for a specific stream, however, would depend upon the layout of artificial drainage channels, roads, and other man-made features, and upon the many more subtle topographic and geologic characteristics of the properties.

A plan for storm-water routing should be included with the final subdivision proposal, and the effects of the subdivision on downstream culverts and floodprone areas should be weighed.

VEGETATION/WILDLIFE RESOURCES

The Upham property is heavily wooded with a mature mixed hardwood and hemlock stand. Hardwood species include maple, oak, black birch, and hickory. The quality of this woodland habitat for wildlife is fair to good; however, the thick forest canopy reduces light penetration, thus limiting the production of fruiting shrubs and understory browse plants. Understory species include hardwood and hemlock seedlings and saplings (25%), mountain laurel (50%), small areas of green brier, maple leaf viburnum, ground pine and other species (25%).

The area provides the elements of habitat for both game and non-game species of birds and mammals such as seasonal songbirds, white-tailed deer, raccoon, ruffed grouse, chipmunk, grey squirrel, opossum and other woodland animals.

During the field review, tracks, trails and droppings of deer were observed, numerous species of songbirds were sighted, and squirrels were noted in areas where nut-producing trees predominated. Along the wetland and stream course tracks of deer, squirrel, raccoon and skunk were seen.

Although deer are obviously in the area, they do not appear to utilize it heavily for browse. With the State Forest and open fields within close range, the thick understory may provide deer with protection from weather, or hiding areas during hunting season.

Open fields on the Kennedy property provide suitable habitat for openland wildlife. Most of these fields are vegetated with native grasses and some fruiting

shrubs. Suitable deer browse is located along the field-forest edge. This browse did not appear to be heavily utilized.

The small stream-wetland within the Upham and Kennedy property provide habitat for certain species of birds and mammals and a water source for other animals. Efforts should be made to preserve good water quality and maintain the integrity of the system. Implementation of an open space streambelt zone as proposed will protect the area, but the impact of a road crossing and discharge of stormwater will cause some degradation. The construction of an access road parallel to the streambelt (Kennedy/Upham proposal) may have significant negative impact on the stream due to discharge of stormwater, silt, and road sand.

Development of the area as proposed (Upham or Kennedy/Upham plan) will eliminate habitat for deer and other native woodland wildlife. The presence of large areas of State Forest and other wooded areas adjacent to the property will reduce the impact on local wildlife. Clearing and creation of new edge areas may provide some benefits to wildlife. However, urbanization usually eliminates the suitability of the habitat for local wildlife and the result is an increase in urban wildlife forms such as robins and other bird species, and mammals such as skunk and raccoon.

FOREST RESOURCES

Forest resources for the Upham/Kennedy properties have been divided into six distinct stand types as described below.

STAND ONE: This softwood and mixed hardwood area of approximately 21 acres is dominated by pole to sawlog size hemlock, white pine, red oak, scarlet oak, black birch and red maple in the wet areas. The understory is primarily composed of sapling size hemlock. As this area has steep terrain and shallow soils in many sections, it is best suited for softwood growth. A moderate sawlog harvest would encourage softwood reproduction by thinning the canopy and allowing more light to penetrate to the forest floor,

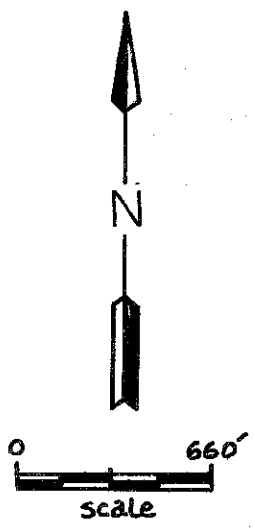
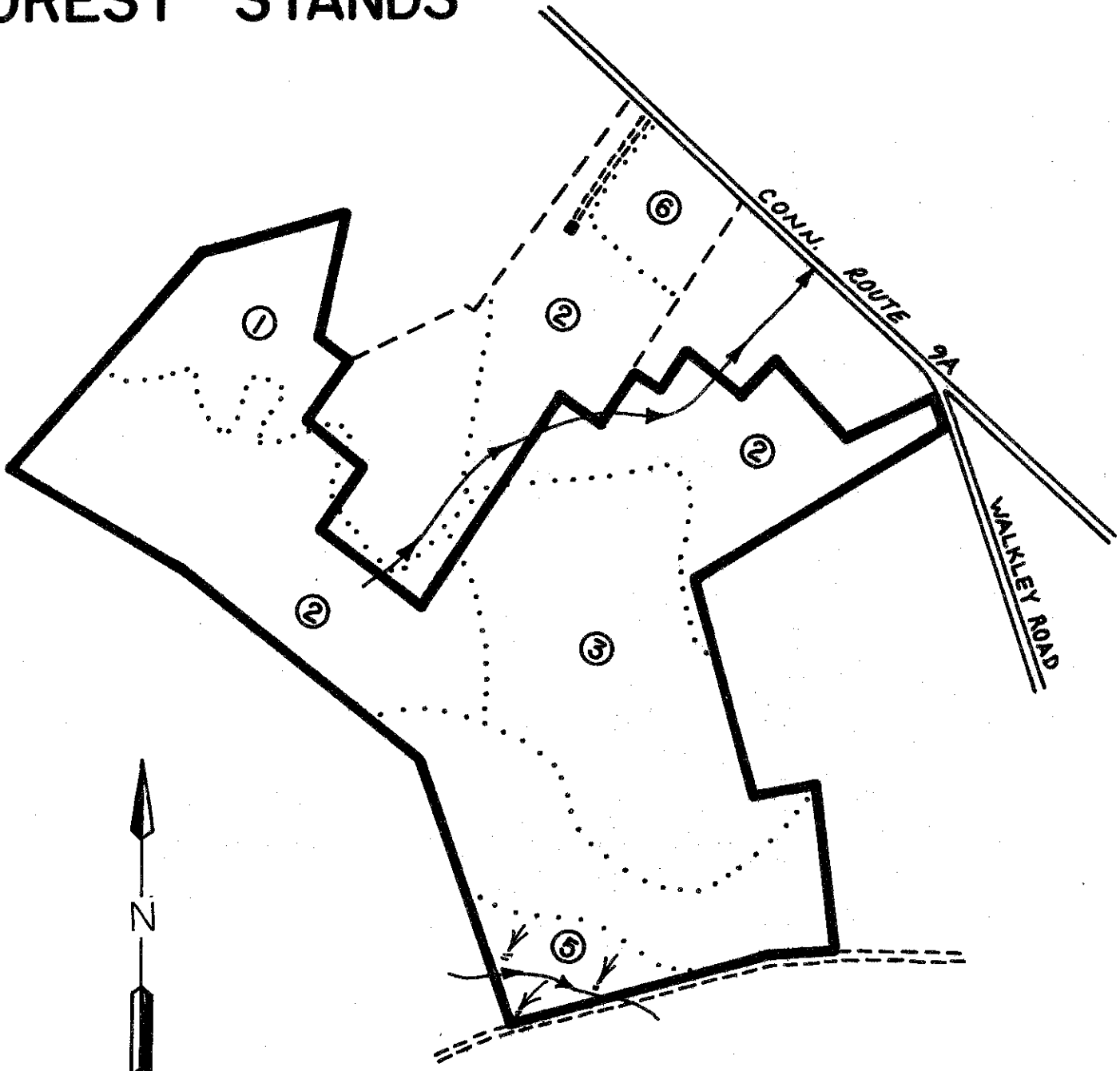
STAND TWO: This 74 acre mixed hardwood stand is primarily composed of pole to sawlog size red oak, scarlet oak, black oak, red maple, hickory, black birch and beech. Hemlock is scattered throughout the stand. The understory is composed of dense areas of mountain laurel which restrict any tree reproduction. Any development which takes place in this area should save as many of the trees with high aesthetic quality as possible.

STAND THREE: This 40 acre mixed hardwood area is dominated by red oaks, scarlet oaks, maples and hickories. The understory is almost entirely occupied by mountain laurel which severely limits tree reproduction. Due to shallow soils in this area, windthrow damage during development is a possibility. Retention of this stand as forested open space would be one solution to this problem.

STAND FOUR: This mixed hardwood area is composed of approximately 24 acres of red oak, black oak, black birch, red maple, hickory and ash. The understory is composed of sapling size reproduction of similar species. This area appears to have the best growing potential of the entire site and retention of as many trees as possible here should be encouraged.

STAND FIVE: This 7 acre wetland area is fully occupied by red maple, with some ash in drier sections. The understory is dominated by wetland shrubs such

FOREST STANDS



LEGEND:

- Stand Boundaries
- Kennedy Boundaries
- ==== Undeveloped Road
- ~~~~~ Watercourses and Wetlands

prepared by D. Smith, D.E.P.

as spicebush and witch hazel. It is recommended that this area be retained as open space as proposed.

STAND SIX: This 6 acre field is currently unforested. Foresting this area with softwoods available from the State or shade trees to enhance development value is a possibility.

SOILS

A detailed soils map of this site is included in the Appendix to this report, accompanied by a chart which indicates soil limitations for various urban uses. As the soil map is an enlargement from the original 1,320'/inch scale to 660'/inch, the soil boundary lines should not be viewed as absolute boundaries, but as guidelines to the distribution of soil types on the site. The soil limitation chart indicates the probable limitations for each of the soils for on-site sewerage, buildings with basements, buildings without basements, streets and parking, and landscaping. However, limitations, even though severe, do not preclude the use of the land for development. If economics permit large expenditures for land development and the intended objective is consistent with the objectives of local and regional development, many soils and sites with difficult problems can be used. The soils map, with the publication Special Soils Report, Connecticut River Estuary Planning Region, can aid in the identification and interpretation of soils and their uses on this site. Know Your Land: Natural Soil Groups for Connecticut can also give insight to the development potentials of the soils and their relationship to the surficial geology of the site.

Soils most representative of the Upham/Kennedy properties include the Charlton-Hollis series, the Canton series and the Ridgebury, Leicester and Whitman series. Most development limitations are related to slope, stoniness, shallow depth to bedrock, wetness and slow permeability.

The Charlton series consists of gently sloping, sloping, moderately steep, and steep, well drained soils on uplands. They formed in friable glacial till. Charlton soils have moderate to moderately rapid permeability. Major development limitations are related to slope and stoniness.

The Hollis series consists of gently sloping, sloping, moderately steep and steep, shallow and well drained soils on uplands where relief is influenced by the underlying bedrock. They formed in glacial till less than 20 inches deep, over granite, gneiss and schist bedrock. Hollis soils have moderate permeability. Major limitations are related to depth to bedrock, rockiness and slope.

The Canton series consists of gently sloping, sloping, moderately steep and steep, well drained soils on uplands. They formed in a fine sandy loam mantle underlain by friable gravelly sand glacial till. Canton soils have moderately rapid or rapid permeability. Major limitations are related to slope and stoniness.

The Ridgebury, Leicester and Whitman series are poorly and very poorly drained soils. These soils occur in an intricate and complex pattern and separation of each individual soil was not practical on the scale surveyed. Each mapping unit may contain an individual soil or a percentage of each of the three soils. They are similar to the soil described for their series. More than 3 percent of the surface is covered with stones. This soil is a regulated wetland

soil under Public Act 155. Most use limitations are related to stoniness, wetness and slow permeability in the substratum.

As the soils limitation chart in the Appendix shows, most soils on both properties are severely limited for establishing buildings with basements and on site sewage disposal systems due to their slope, stoniness and shallow depth to bedrock. It should be noted, however, that deep pockets of soil may be located sporadically throughout the Charlton-Hollis mapping unit, allowing for establishment of basements and septic systems. The burden of locating these areas would fall upon the developer, but it would be the Town's responsibility to see that these facilities were installed in these specified areas and not in another location on the lot.

A sediment and erosion control plan should be developed and followed explicitly during any construction on this site. Uncovering soils on steep slopes here could cause considerable environmental degradation in the form of soil erosion and gulleying. Connecticut's Erosion and Sediment Control Handbook published by the Soil Conservation Service will aid both the developer and the Town in preparing and approving an adequate erosion and sediment control plan. Standards and specifications for both mechanical and vegetative practices listed within the Handbook are available at the Middlesex County Extension Center, Haddam, Connecticut.

WASTE DISPOSAL

The geologic environment of much of the Upham and Kennedy properties and the number and density of houses to be built are not conducive to the success of individual on-site septic systems. Areas exist where limited development seemingly will cause few waste disposal problems, but complete development as planned may be detrimental to the local potable water supply. In addition, the possibility of some septic system failures and the concurrent health hazards appears to be high under the present plan.

The major adverse hydrogeologic factors of the site as a whole are thinness of overburden, slope, and development density. High water tables may also be a problem in certain parts of the properties. Large daily wastewater discharges into zones of thin soils are likely to result in "outcropping" of leachate at the surface, especially in regions of steep slopes; in the introduction of poorly renovated effluent into the bedrock fracture system, the source of domestic water supplies for the subdivision; or both. Movement of groundwater within bedrock fracture zones is thought to be rapid, and contaminants such as nitrate, viruses, and bacteria are not extensively removed.* The direction of groundwater movement within the fracture system is not known presently; however, the bedrock-controlled hill on which much of the Upham property is situated is effectively a recharge area (see schematic diagram, Figure 3), and it is therefore very likely that dis-

* Sources: Hall, M.W., "A conceptual model of nutrient transport in subsurface soil systems", pp. 55-64, in Water Pollution Control in Low Density Areas: Proceedings of a Rural Environmental Engineering Conference, W.J. Jewell and R. Swan, eds., 1975, 498 p.
Holzer, T.L., "Limits to growth and septic tanks", pp. 65-74, ibid.
Sproul, O.J., "Virus movement into groundwater from septic tank systems", pp. 135-144, ibid.

charges from septic systems in the development will become part of the water supply of local homes, including some homes that already exist. Such situations may not be of major importance if the soil is capable of properly treating the percolating effluent. However, in many areas of the proposed subdivision, the soil appears to be too thin to do more than a minor amount of purification.

In areas of the properties where the till is not too compact and relatively thick (greater than 7 feet), septic systems may be placed with more confidence. This, of course, assumes that the slope is not a severely limiting factor in itself. Moreover, soil conditions that are adequate for removing organic constituents generally allow the production of nitrate in the effluent; the nitrate is then carried along into the groundwater.

It is recommended, on the basis of the high probability of adverse septic system effects, that development in the areas designated as thin till or as bedrock outcrop on Figure 1 be sparing at best. Development in other areas should proceed with caution, and preferably should occur at a lesser density than is presently planned. If full development takes place, it may be prudent to test periodically the level of contaminants in local tap water to be certain that these levels are not unhealthy.

WATER SUPPLY

Individual on-site wells are proposed to provide water to homes within the subdivision. Because shallow till deposits are inadequate as sources of water, wells on the properties would have to tap the bedrock aquifer. Groundwater yields from bedrock wells may vary considerably within short distances; factors affecting the yield include sizes and number of fractures encountered, topographic position of the well, type of overburden, and several others. Connecticut Water Resources Bulletin No. 30 contains information on 12 bedrock wells within a two-mile radius of the proposed subdivision. The average depth of the wells is 170 feet, with a range from 98 to 400 feet. The average yield of the wells is 6.3 gallons per minute (gpm), with a range of 1 gpm to 15 gpm. Because much of the Upham parcel is located around the top of a small bedrock-controlled hill, which limits the amount of groundwater recharge to the uppermost fracture zone, yields to wells in that area are likely to be smaller than average. It is also possible that homeowners along Walkley Hill and Clark Roads may experience a decrease in their well yields as a result of the large withdrawals of water in the subdivision.

The quality of water from on-site bedrock wells is likely to be acceptable, at least initially. It is believed that full development under the present plan could adversely affect water quality.

ROADS

The only accesses to the property which are presently assured are from Walkley Hill and Clark Roads. The other two accesses are contingent upon consent from other property owners. Walkley Hill Road averages 24' wide, and Clark Road 16-18' wide with one point at a culvert approximately 14' wide. Both roads, but especially Clark Road, have poor horizontal and vertical alignment. The poor alignment and uneven surface of the roads indicate they both are former dirt roads paved over without proper subgrade. Presently the traffic volume on both roads is moderate

enough so severe road deterioration and safety considerations do not appear to be problems. Clark Road serves approximately 15 houses. An additional 81 to 100 houses each producing several trips per day may impose a safety hazard and excessive wear on these roads. Improvement of Clark Road may be possible, but only justifiable if considerable new traffic is anticipated. Additional development in the vicinity of the Upham-Kennedy subdivision is unlikely because most of the remaining land to the west is part of the Cockaponset State Forest. Also improvement of Clark Road to meet town standards may not be aesthetically justifiable.

The subdivision plans show proposed roads with grades frequently between 5-10%. In both proposed plans, approximately 60% of the total roadways have grades exceeding 5%. In one section of the "Upham only" proposal, a section of proposed road appears to exceed a grade of 15% for a distance of 600'. Although the town subdivision regulations permit 10% road grades, such consistent use of steep roads creates an undesirable condition particularly during winter for school buses, emergency vehicles and trucks.

The plans seem to have as their main purpose achieving as many lots as possible rather than fitting the road design to the topography. Fitting the road to the land could best be done by substantially increasing lot sizes or by grouping the lots in the most easily developed areas, and thus allowing greater freedom to site the road carefully, in the more rugged parts of the property.

Town road standards require a 28' paved roadway. Because of the expensive construction costs due to ledge and steep slopes, and the incongruity to the neighborhood of such a wide road, a reduction in road width to 24' or 26' width with a well constructed sub-base may be a more suitable road standard for this area. A reduction in road width may also be more readily justified if the subdivision contained fewer houses.

During construction, cuts to maintain consistent grades and excavations for road subgrade will be complicated and made very expensive by the shallow to bedrock soils and steep slopes.

Unless a second access is obtained, the road system of both proposals will be a loop road and/or dead end road. Several of the dead end roads would exceed the town subdivision regulations that roads not be more than 1,000' in length and serve not more than 20 building lots.

COMPATIBILITY OF SURROUNDING LAND USES

The surrounding land uses are exclusively rural--the State Forest to the west and very low density residential in all other directions. The introduction of a large one-acre subdivision of suburban character would be incongruous with these present land uses. Substantially larger lots or devoting more of the property to open space would be more in keeping with the area's existing rural character.

SERVICES TO SUPPORT DEVELOPMENT

Commercial - Haddam has very few commercial facilities. However, most of the facilities that do exist are located nearby in Higganum Center.

Education - Haddam recently built, in conjunction with Killingworth, a regional high school on New City Road. This year is its first full year of operation. The junior high school is located on the same site as the high school. The town has two elementary schools--the Haddam Elementary and the Burr District schools. The office of the Haddam Superintendent of Schools indicated the high school and junior high school have considerable capacity for new students, but the elementary schools are both presently filled to capacity.

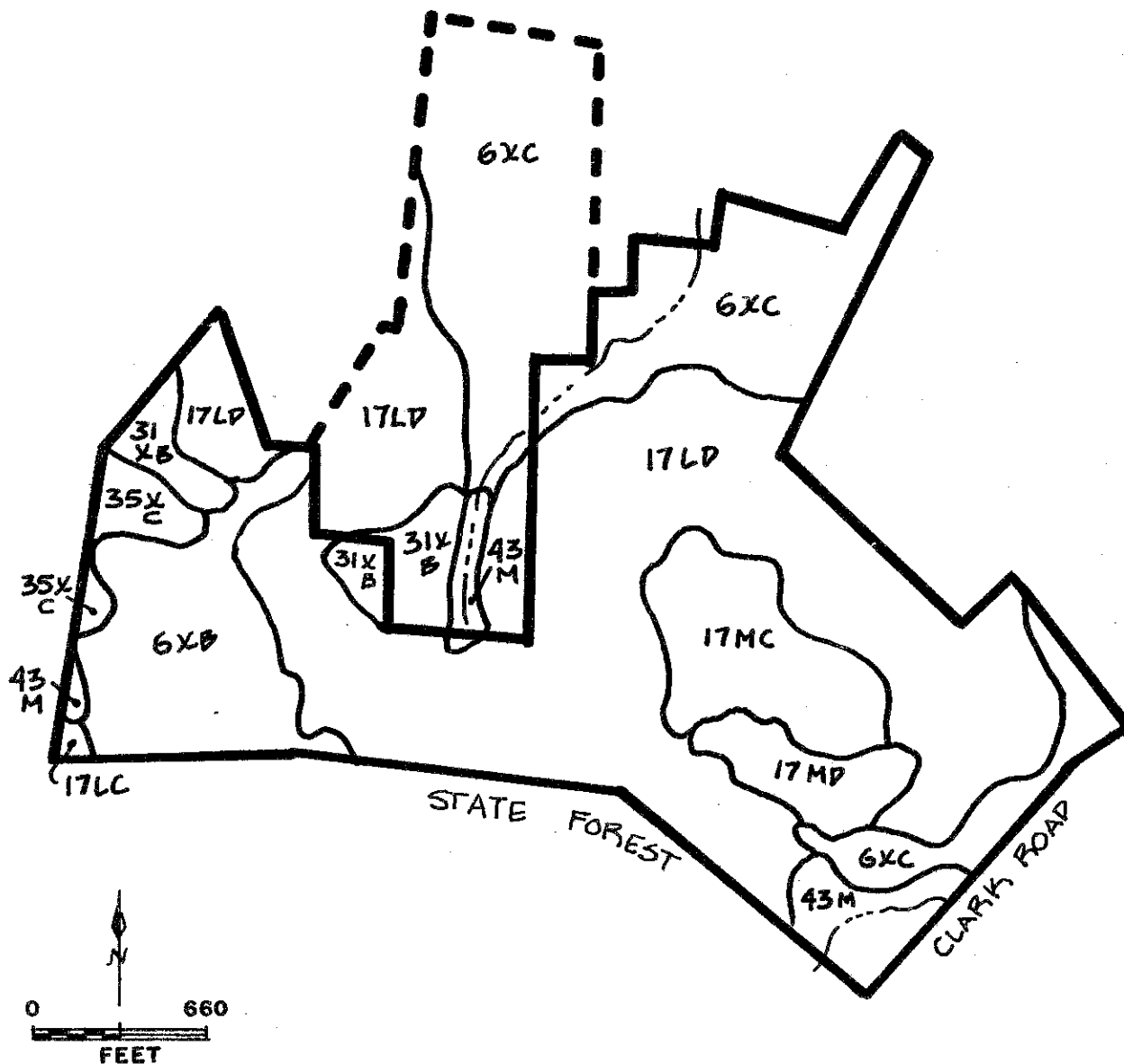
The superintendent's office indicates it does not have accurate pupil enrollment projections. However, the proposed subdivision could have considerable impact on the school system. Single family homes with 3 to 4 bedrooms usually produce the largest number of children per household of any housing type. Data derived from the 1970 census, General Social and Economic Characteristics, indicate that households in urban fringe areas each have an average of 1.1 students from nursery school to 12th grade. Kindergarten through 8th grade account for approximately 70% of these students.

Solid Waste - The town presently disposes of solid waste in the town land fill, but the projected life span for this facility is only through 1978. The town is presently pursuing with Middletown a proposal for a combined transfer station. Inter-municipal agreements for solid waste disposal are notoriously difficult to implement, and many years frequently pass before a satisfactory solution is reached. The Upham proposal would contribute to the town's waste stream during both construction and once the homes are occupied.

Appendix

Soils

UPHAM/KENNEDY SUBDIVISION
HADDAM, CONNECTICUT



This map is an enlargement from the original 1,320'/inch scale to 660'/inch.

Information taken from: Special Soil Report, Connecticut River Estuary Planning Region, 1975; Soil Survey Sheet No. 1637; prepared by United States Department of Agriculture, Soil Conservation Service. Advance copy, subject to change.

UPHAM PROPERTY
HADDAM, CONNECTICUT

PROPORTIONAL EXTENT OF SOILS AND THEIR LIMITATIONS FOR CERTAIN LAND USES

Soil Series	Natural Soil Group	Soil Symbol	Approx. Acres	Percent of Acres	Principal Limiting Factor	Urban Use Limitations*			
						On-Site Sewage	Buildings with Basements	Streets & Parking	Land-Scaping
Canton		6XC	29.4	24%	slope, large stones	2	2	2	2
Hollis-Charlton		17LC	30.6	26%	large stones, shallow to bedrock	3	3	3	3
Hollis-Charlton		17LD	26	21%	slope, stones, shallow to bedrock	3	3	3	3
Ridgebury-Whitman		43M	11	9%	wetness, large stones	3	3	3	3
Woodbridge		31XB	5	4%	large stones, wetness, frost action	3	3	3	2
Woodbridge		31MC	6.5	6%	"	3	3	3	3
Paxton		35XB	5.5	5%	large stones, frost action	3	2	2	2
Paxton		35XC	3	2%	Large stones, slope, frost action	3	2	2	2
Montauk		85XB	4	3%	Large stones, slope, frost action	3	2	2	2

Limitations: 1 = slight, 2 = moderate, 3 = severe

KENNEDY PROPERTY
HADDAM, CONNECTICUT

PROPORTIONAL EXTENT OF SOILS AND THEIR LIMITATIONS FOR CERTAIN LAND USES

Soil Series	Natural Soil Group	Soil Symbol	Approx. Acres	Percent of Acres	Principal Limiting Factor	Urban Use Limitations*			
						On-Site Sewage	Buildings with Basements	Streets & Parking	Land-Scaping
Hollis-Charlton		17LD	4.5	14%	slope, stones, shallow to bedrock	3	3	3	3
Canton		6XB	12.3	39%	large stones	2	2	1	2
Paxton		35XC	2.5	8%	large stones, frost action slope	3	2	2	2
Woodbridge		31XB	2.5	8%	large stones, wetness, frost action	3	3	3	2
Canton-Charlton		6MD	3.0	9%	slope, large stones	3	3	3	3
Canton		6XC	6.92	22%	slope, large stones	2	2	2	2

Limitations: 1 = slight, 2 = moderate, 3 = severe

SOIL INTERPRETATIONS FOR URBAN USES

The ratings of the soils for elements of community and recreational development uses consist of three degrees of "limitations:" slight or no limitations; moderate limitations; and severe limitations. In the interpretive scheme various physical properties are weighed before judging their relative severity of limitations.

The user is cautioned that the suitability ratings, degree of limitations and other interpretations are based on the typical soil in each mapping unit. At any given point the actual conditions may differ from the information presented here because of the inclusion of other soils which were impractical to map separately at the scale of mapping used. On-site investigations are suggested where the proposed soil use involves heavy loads, deep excavations, or high cost. Limitations, even though severe, do not always preclude the use of land for development. If economics permit greater expenditures for land development and the intended land use is consistent with the objectives of local or regional development, many soils and sites with difficult problems can be used.

Slight Limitations

Areas rated as slight have relatively few limitations in terms of soil suitability for a particular use. The degree of suitability is such that a minimum of time or cost would be needed to overcome relatively minor soil limitations.

Moderate Limitations

In areas rated moderate, it is relatively more difficult and more costly to correct the natural limitations of the soil for certain uses than for soils rated as having slight limitations.

Severe Limitations

Areas designated as having severe limitations would require more extensive and more costly measures than soils rated with moderate limitations in order to overcome natural soil limitations. The soil may have more than one limiting characteristic causing it to be rated severe.

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.

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, 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 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 Jeanne Shelburn (889-2324), Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, 139 Boswell Avenue, Norwich, Connecticut 06360.