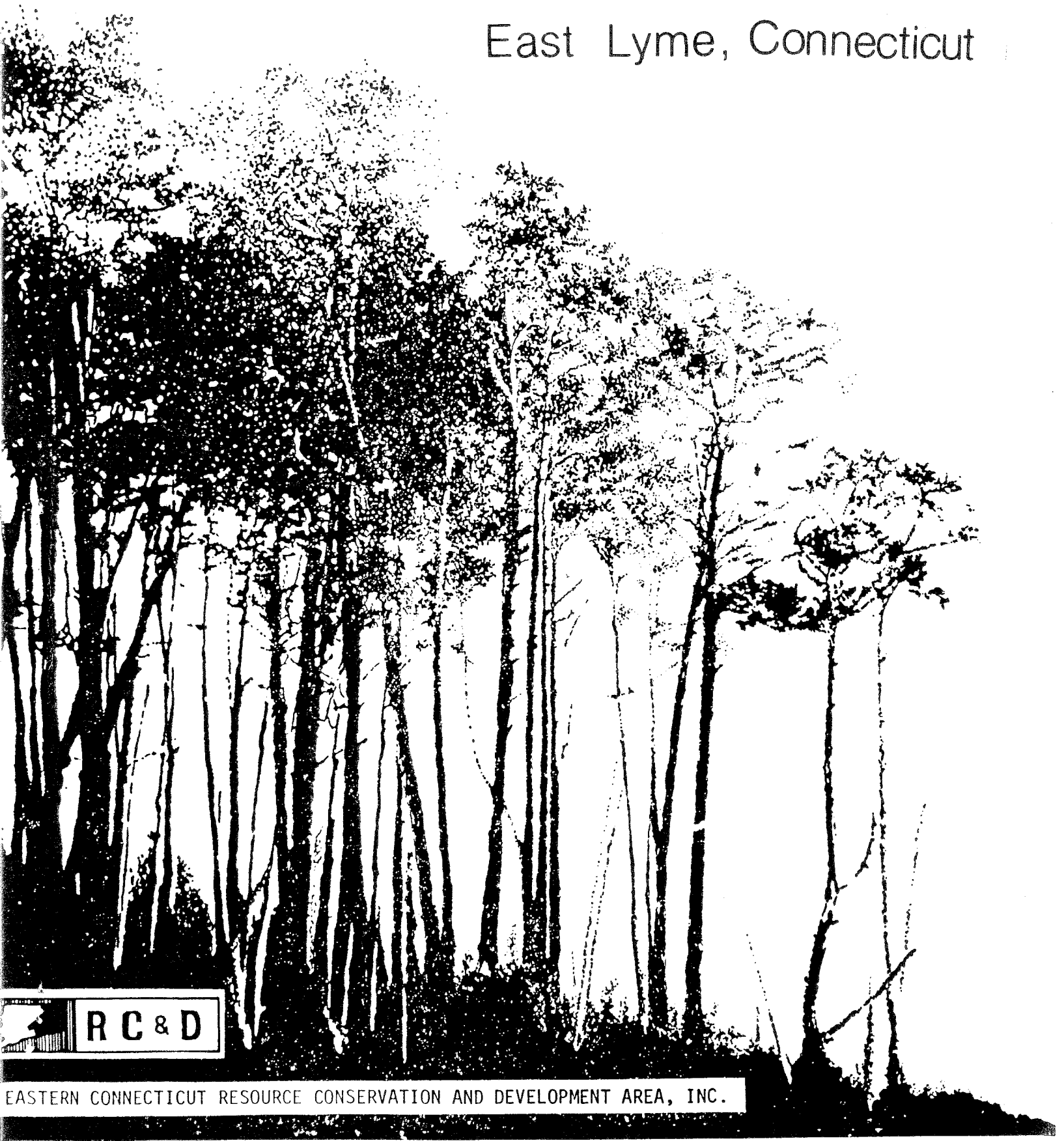
Environmental Review Team Report

Southeast Associates

East Lyme, Connecticut



R C & D

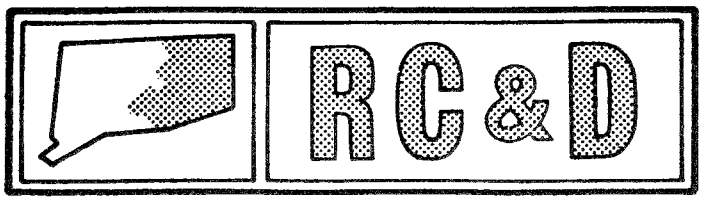
EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

Environmental Review Team
Report

Southeast Associates

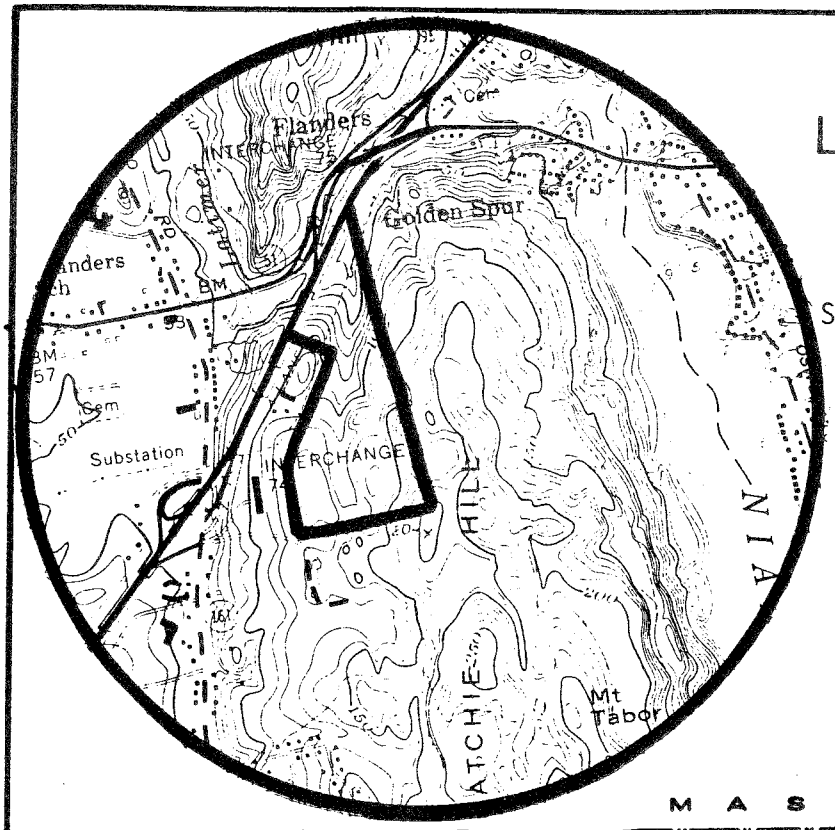
East Lyme, Connecticut

May, 1984



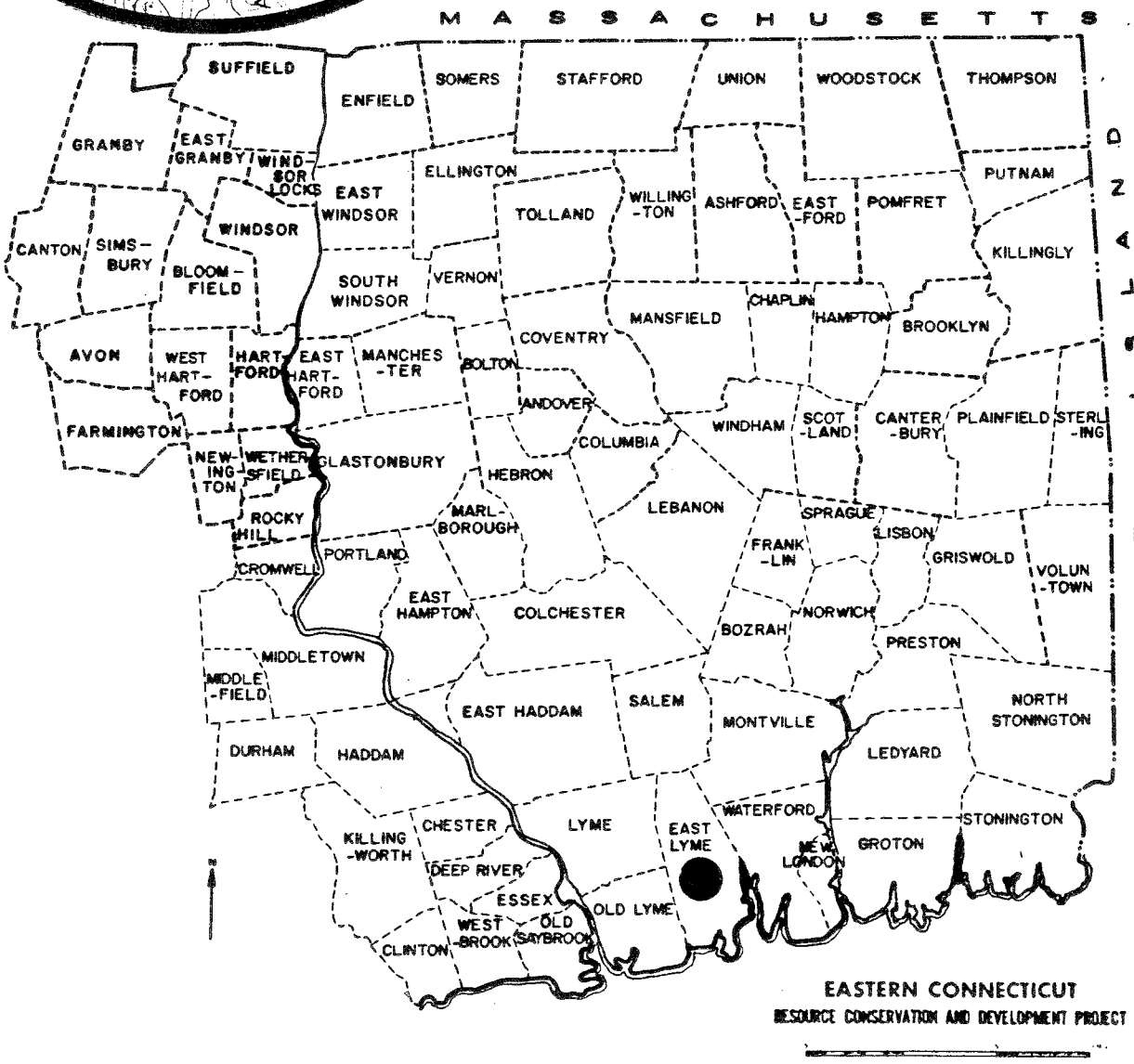
Eastern Connecticut Resource Conservation & Development Area

Environmental Review Team
PO Box 198
Brooklyn, Connecticut 06234



Location of Study Site

SOUTHEASTERN ASSOCIATES DEVELOPMENT
EAST LYME, CONNECTICUT



ENVIRONMENTAL REVIEW TEAM REPORT
ON
SOUTHEASTERN ASSOCIATES
MULTI-FAMILY DEVELOPMENT
EAST LYME, CONNECTICUT

This report is an outgrowth of a request from the East Lyme Planning and Zoning Commission to the New London 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 as a project measure. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

The soils of the site were mapped by a soil scientist of the United States Department of Agriculture (USDA), Soil Conservation Service (SCS). Reproductions of the soil survey map as well as a topographic map of the site were distributed to all ERT participants prior to their field review of the site.

The ERT that field checked the site consisted of the following personnel: Barry Cavanna, District Conservationist, Soil Conservation Service (SCS); Bill Warzecha, Geologist, Department of Environmental Protection (DEP); Emery Gluck, Forester, (DEP); Charles Storrow, Regional Planner, Southeastern Connecticut Regional Planning Agency; Don Capellaro, Sanitarian, State Department of Health; and Jeanne Shelburn, ERT Coordinator, Eastern Connecticut RC&D Area.

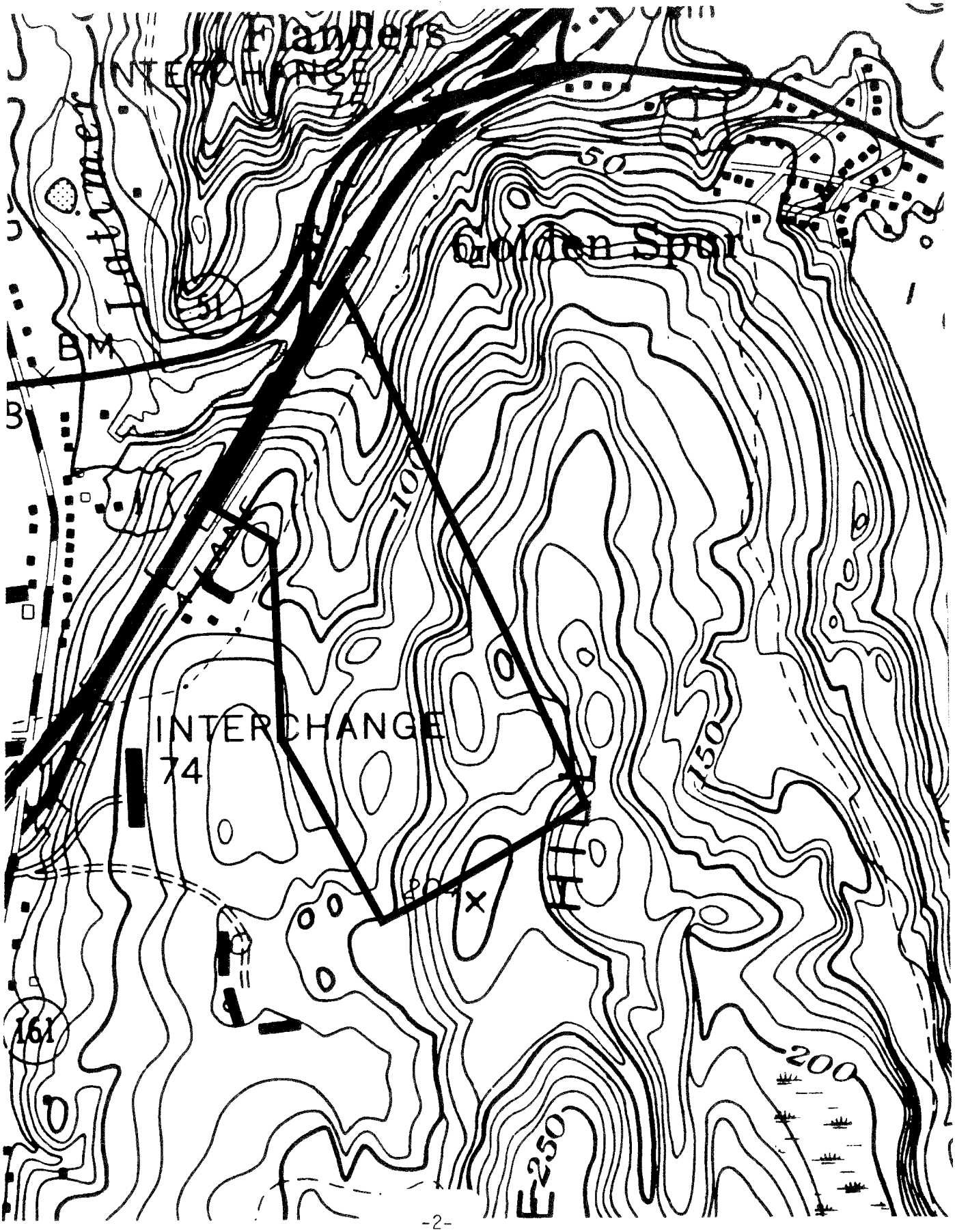
The Team met and field checked the site on Thursday, April 5, 1984. Reports from each Team member were sent to the ERT Coordinator for review and summarization for the final report.

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 East Lyme. 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 Project Committee hopes you will find this report of value and assistance in making your decisions on this particular site.

If you require any additional information, please contact: Ms. Jeanne Shelburn, Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, P.O. Box 198, Route 205, Brooklyn, Connecticut 06234, 774-1253.

Topography	Site Boundary	0 660' scale	N



INTRODUCTION

The Eastern Connecticut Environmental Review Team was asked to prepare an environmental assessment for a proposed multi-family development in the Town of East Lyme. The project site is approximately 60 acres in size and is located south and east of Interstate 95 near its interchange with Routes 51 and 161. The property is being developed by Southeastern Associates. Preliminary plans have been prepared by Centroplex, a Colchester engineering firm.

Preliminary plans show 118 units, divided into four development phases. The development will be served by on-site septic systems and municipal water supply. A single road extending into the property from King Arthur Court will provide access to the site. One and one-half parking spaces per unit will be provided by the developer.

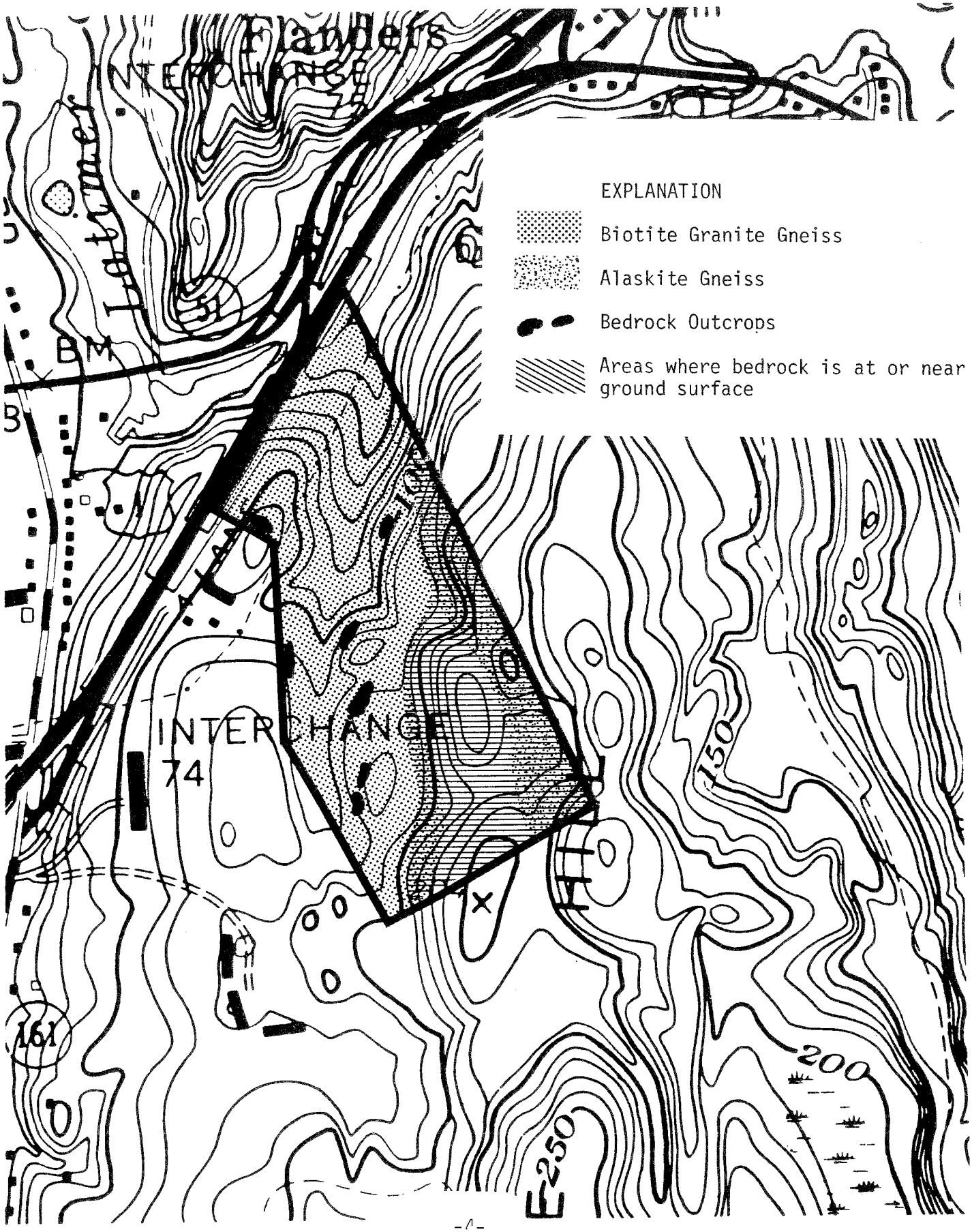
Latimer Brook runs through the northwestern portion of the site. Associated wetland areas extend along the western perimeter and into the central portion of the site. Sections of the site are steeply sloping. The property is entirely vegetated at present, some areas have dense populations of mountain laurel.

The Team is concerned with the effect of the proposed development on the natural resource base of this site. Although many sites have severe limitations to development, which can often be overcome with proper engineering techniques, these measures can become costly, making a project financially unfeasible for a developer. Development of areas on a site with fewer natural restrictions can lower these costs. Cluster development, therefore, may become a more desirable and economically feasible alternative to standard residential subdivision development on a marginal site.

The project site has a number of severe limitations to development, among them are regulated wetland areas, steep slopes and shallow depth of soils to bedrock. These limitations will, in turn, cause potential problems with building foundation location, location and proper functioning of septic systems and increases in storm water runoff from the site. Traffic increases onto Route 161 from this development may also be a significant concern.

The following sections of this report describe the site and the Team members' concerns in detail.

Bedrock Geology



ENVIRONMENTAL ASSESSMENT

TOPOGRAPHY

The proposed development site is located in the east central part of East Lyme. The ±60 acre tract is located south and east of Interstate 95 near its interchange with Routes 51 and 161. A portion of the property flanks the northern end of Oswegatchie Hill.

The topographic relief of the site, as shown in the accompanying map, is diverse with the majority of slopes ranging from moderate to steep. Bedrock, which outcrops extensively throughout the parcel, largely controls the topography. There are some nearly flat plateaus in the southern parts of the site. Minimum and maximum elevations on the site are 70 feet and 210 feet above mean sea level, respectively.

Latimer Brook, which traverses the northern tip of the site, is the principal watercourse on the property. Numerous intermittent drainage channels, along with their accompanying wetlands, are visible throughout the site.

GEOLOGY

The subject parcel is located entirely within the Niantic topographic quadrangle. A bedrock geologic map (GQ-575) and a surficial geologic map (GQ-329) prepared by Richard Goldsmith for the quadrangle have been published by the U.S. Geological Survey.

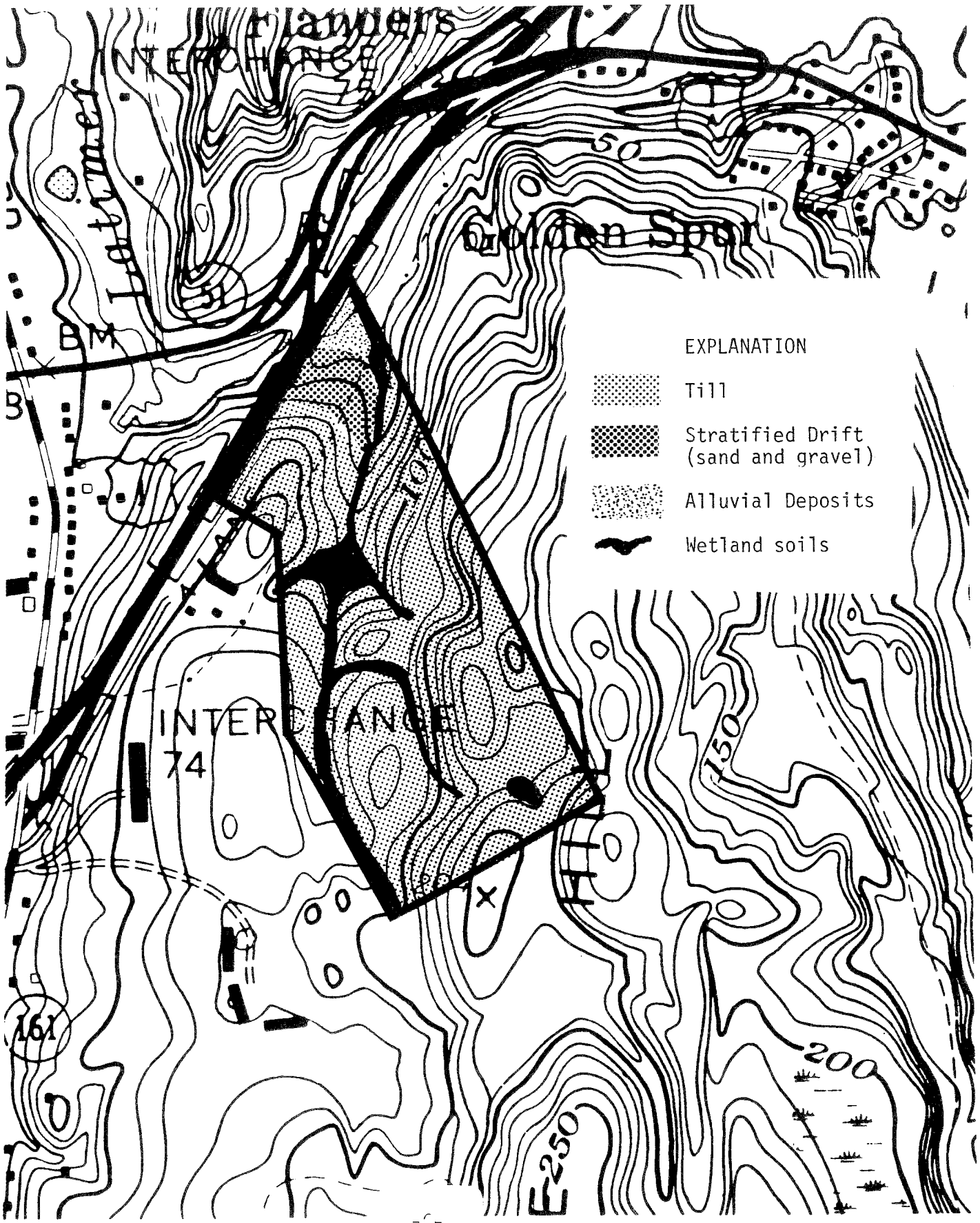
Goldsmith classifies the bedrock underlying or cropping out on the site as two types of gneisses; biotite granite gneiss and Alaskite gneiss.

The biotite granite gneiss comprises approximately 80 percent of the rock underlying or cropping out on the site. It consists of a gray, medium-grained gneiss composed essentially of the minerals quartz, oligoclase, microcline and biotite. The minerals sillimanite, garnet and muscovite may occur locally. The term "gneiss" refers to crystalline rock in which very thin bands of elongate minerals (micas) alternate with bands of minerals (quartz and feldspar) having a rounder or blockier shape. As a result, the rock has a banded appearance.

The Alaskite gneiss underlies or outcrops along the eastern limits of the site. This rock consists of an orange-pink to light-gray, fine to medium grained gneiss which has a granite composition. That is, composed largely of light colored minerals such as quartz and feldspar (microcline, albite, sodic plagioclase) with only small amounts of dark colored minerals (i.e., biotite). The descriptive term "alaskite" preceeding the word gneiss, above, refers to rock which have a granite (i.e., granite and potassium feldspar) composition and contain only a few percent of dark minerals.

Depth to bedrock is generally shallow (not much more than 10 feet) throughout the parcel. Numerous bedrock outcroppings are visible throughout the site (Source: Connecticut Water Resources Bulletin #15).

Surficial Geology



It should be pointed out that both rock units have been used, or could potentially be used as building stone or rip-rap. Both have been quarried in the Town of East Lyme.

Nearly all of the site is covered by a relatively thin blanket of glacial sediment referred to as till. Till, which was deposited directly by glacier ice that formerly covered the area, consists of rock particles and fragments of various shapes and sizes. Because the till was not re-worked by meltwater streams emanating from the glacier, it is generally non-sorted and non-stratified. The texture of till is generally sandy in the upper few feet; however, at depth it commonly becomes siltier and more compact. Because of its compact nature at depth, groundwater movement is usually slow, often resulting in an elevated groundwater table. As a result, the applicant should give consideration to installing footing drains in all buildings. Footing drains should be backfilled with gravel and the outlets carefully protected to reduce the potential for soil erosion. In addition, excavation with hand tools may be difficult.

Another type of glacial sediment found at the northern tip of the parcel are sand and gravel deposits (stratified drift). These sediments were laid down by meltwater streams from the glacier ice in the Pataguanset River Valley. These deposites, which lie principally along Latimer Brook, are designated by the symbol Nn (Ninigret soils) on the accompanying soils map. Thickness of the stratified drift range from a few inches at till/stratified contact to probably not much more than 10 feet (Source: Connecticut Water Resources Bulletin #15).

According to the soils map attached to the pre-review packet, which is adapted from the "Soil Survey for New London County" (Soil Conservation Service), there are wetland soils overlying till, stratified drift, and/or bedrock primarily along intermittent drainage channels throughout the site. These areas are designated as Rn (Ridgebury, Leicester, and Whitman soils) and Aa (Adrian and Palms muck). Where the Rn soils are characterized by a seasonally high water table, the Aa soils are commonly wet throughout most of the year.

Another type of sediment found along Latimer Brook are alluvial deposits. These deposits consist of poorly to well-sorted silt, sand and gravel that were deposited on the flood plain or banks of Latimer Brook.

The main limiting geologic factors found on the site which may pose potential problems with regard to developing the site as multi-family dwellings include:
(1) areas where bedrock is at or is relatively close to ground surface; (2) the presence of moderate to steep slopes primarily in the central parts of the site; (3) the presence of wetland soils which stretch along intermittent drainage channels throughout the site; (4) compact nature of some till based soils, which may result in high ground water tables; and (5) stoniness, which is characteristic of till-based soils.

These limiting factors will weigh heaviest on the ability to provide adequate sub-surface sewage disposal systems, which will be required because public sewers are not available to the site. Although these conditions may not preclude the development of the site, detailed site testing in the proposed leaching areas will be required in order to determine whether or not these areas can handle the expected volume of sewage effluent and be in compliance with all state and local regulations. Properly engineered and installed septic systems may overcome the geologic limitations mentioned earlier.

Since bedrock is at or near ground surface throughout a major portion of the site, there certainly appears to be a chance that blasting will be necessary for the interior road system, building foundations, or for the creation of trenches for the public water supply lines.

Where slopes exceed 15 percent, conditions become hazardous for heavy equipment and may also require considerable grading. Because the potential for serious erosion is high in these areas, especially if blasting is required, it is strongly recommended that a comprehensive erosion and sediment control plan be formulated and followed closely with implementation of the project.

Areas of seasonal wetness which lie principally along intermittent drainage channels will limit the usefulness of these areas. The wetland area designated as "Aa" may lend itself to some important hydrological functions such as (1) serving as a flood and stormwater retention area, which reduces downstream flood flows during periods of heavy precipitation; (2) change surface water quality through biochemical processes, often resulting in cleaner water; and (3) trapping sediments from upstream areas. For these reasons, it is recommended that construction in these areas be avoided. However, if any wetlands are to be filled and/or modified under the proposed project, the applicant first should submit a detailed analysis of the potential effects of such disturbance for review by appropriate town officials and commissions.

According to the site plan submitted to Team members, wetland areas will be avoided for the most part except for four road crossings. Wetland crossings are feasible provided they are properly designed and constructed. The roads should be constructed at least 1.5 feet and preferably 2 feet above the top of the culvert used to cross the wetlands. This will allow for better drainage of the road and decrease the frost heaving potential of the road. It is recommended that road construction be done during the dry time of the year and provisions be made for effective erosion and sediment control.

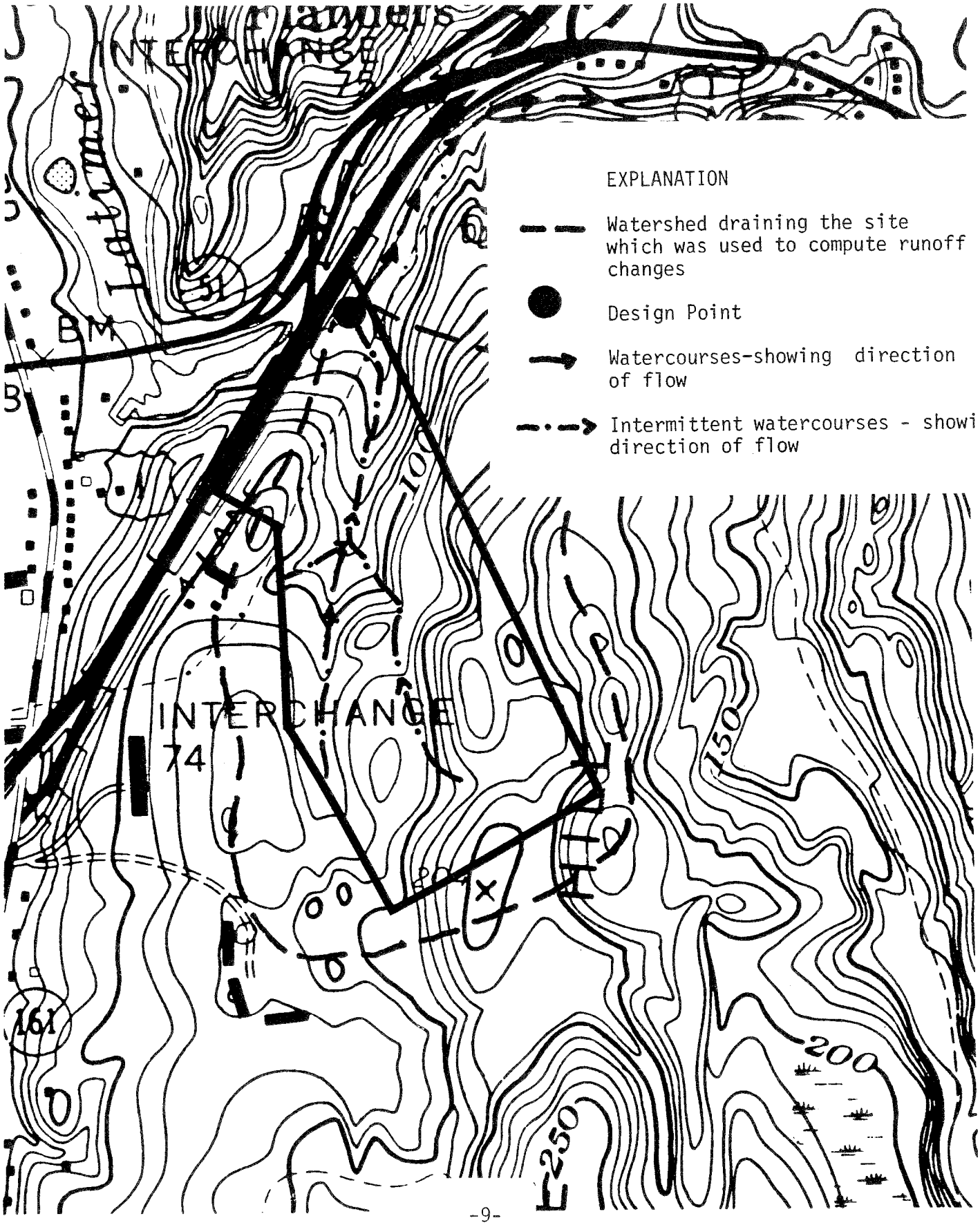
According to town officials, the applicant is considering cluster housing units for the residentially (R-40) zoned portion at the southern limits of the site. From a geological standpoint, the cluster development concept allows the applicant to develop the more favorable areas leaving the poorly suited areas (i.e., wetlands, bedrock outcrop areas, steep slopes, etc.) undeveloped.

HYDROLOGY

The site lies entirely within the watershed of Latimer Brook. Latimer Brook traverses the northern tip of the site in a northeast direction for about 200 feet. It continues to flow eastward ultimately discharging into the Niantic River. Surface runoff throughout the site is shed across the land by sheetflow and is intercepted by intermittent drainage channels. These channels carry runoff into Latimer Brook to the north. Runoff on the parcel is controlled primarily by the underlying bedrock.

Development of the site under the present proposal will lead to increases in the amount of surface runoff produced during periods of rainfall. The increases will arise primarily from conversion of permeable soils to impermeable surfaces (rooftops, driveways, etc.) and from the removal of vegetation. The added runoff could cause

Drainage Areas



increased overland and stream channel erosion, and it could increase the peak flood flows of the streams on the site. These problems can be addressed by formulating and implementing an effective erosion and sediment control plan, particularly during construction. In addition, consideration should be given to establishing some type of runoff-control device, such as a detention basin or basins.

It is possible to estimate the magnitude of the increases that would occur on the property if the development proceeded as shown by the site plan. For the purpose of computing these estimates, the Team Geohydrologist picked a design point on Latimer Brook, then delineated the watershed which encompasses the subject parcel (see Drainage Area map). A "watershed" may be defined as all land areas from which water may drain into Latimer Brook at the design point (point of outflow) chosen. The estimates below are based on the runoff-curve number method, as outlined in the Soil Conservation Service's Technical Release No. 55. Estimates are provided for 24-hour rainfall amounts that would be expected to occur, over a very long period of time, once every ten years, once every twenty-five years, once every fifty years, and once every 100 years. In any given year, these rainfall amounts have, respectively, a 10 percent, 4 percent, 2 percent, and 1 percent probability of occuring.

Average Storm Frequency	10 year	25 year	50 year	100 year
Runoff before development (inches)	1.51	1.97	2.39	2.98
Runoff after development (inches)	1.81	2.31	2.76	3.39
Percent Increase	20%	17%	15%	14%

These increases are significant and underscore the importance of judicious stormwater management on the site. Prior to approval of the proposed multi-family development, it is recommended that the applicant be required to submit detailed hydrological information on pre- and post-development runoff volumes and peak flows from the site. Estimates should be provided for a 10, 25, 50 and 100 year design storm. Detailed design specifications for all stormwater control facilities (including ponds) should also be submitted.

Floodprone Areas

A Flood Boundary and Floodway Map has been prepared by the Federal Emergency Management Agency for the Town of East Lyme. 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 occurrence remains the same each year regardless of what happened the year before.

Based on the F.E.M.A. map, a '500' year flood boundary lies along Latimer Brook in the northern tip of the site. It appears there may be a small portion of the property at the northern tip of the property which includes the '100' year flood boundary.

control erosion during construction. Stones and boulders need to be removed for landscaping. The Hollis soil has a shallow rooting depth to bedrock and is droughty. Rock outcrops provide attractive settings for homes in many places.

CrD--Charlton-Hollis fine sandy loams, very rocky, 15 to 45 percent slopes. This moderately steep to steep complex consists of somewhat excessively drained and well drained soils on glacial till uplands. Rock outcrops cover up to 10 percent of the surface. Stones and boulders cover 1 to 8 percent of the surface.

The soils of this complex are so intermingled on the landscape that it was not practical to separate them in mapping at the scale used. The complex is about 55 percent Charlton soil, 20 percent Hollis soil, and 25 percent other soils and rock outcrops.

Typically, the Charlton soil has a very dark grayish brown, fine sandy loam surfce layer 3 inches thick. The subsoil is dark yellowish brown, yellowish brown, and light olive brown fine sandy loam 26 inches thick. The substratum is grayish brown fine sandy loam to a depth of 60 inches or more.

Typically, the Hollis soil has a very dark brown, fine sandy loam surface layer 2 inches thick. The subsoil is dark brown and dark yellowish brown fine sandy loam 15 inches thick. Hard, unweathered bedrock is at a depth of 17 inches.

Included with these soils in mapping are small areas of well drained Canton and Narragansett soils. Many small areas have bedrock at a depth of 20 to 40 inches. A few small areas in the northwestern part of the county have redder colors in the subsoil.

Permeability of the Charlton soil is moderate or moderately rapid. The available water capacity is moderate. Runoff is rapid or very rapid. Charlton soil warms up and dries out rapidly in the spring. It is strongly acid or medium acid.

Permeability of the Hollis soil is moderate or moderately rapid above the bedrock. The available water capacity is low. Runoff is rapid or very rapid. Hollis soil warms up and dries out rapidly in the spring. It is strongly acid or medium acid.

The major limiting factors for community development are steepness of slope, shallow depth to bedrock and rock outcrops. Extensive onsite investigatiions are often needed to locate a suitable site for an onsite septic system. Onsite septic systems need careful design and installation to prevent effluent from seeping to the surfce in areas downslope from the leaching system. Stones and boulders need to be removed for landscaping. The Hollis soil is droughty. Excavations require blasting in many places. Quickly establishing a plant cover and using mulch and netting, temporary diversions, and sediment basins help to control erosion during construction.

HrC--Hollis-Charlton-Rock outcrop complex, 3 to 15 percent slopes. This gently sloping to sloping complex consists of somewhat excessively drained and well drained soils and Rock outcrop on glacial till uplands. Stones and boulders cover 1 to 8 percent of the surface.

The soils and Rock outcrop in this complex are so intermingled on the landscape that it was not practical to separate them in mapping at the scale used. This complex

is about 40 percent Hollis soil, 25 percent Charlton soil, 20 percent Rock outcrop, and 15 percent other soils.

Typically, the Hollis soil has a very dark brown, fine sandy loam surface layer 2 inches thick. The subsoil is dark brown and dark yellowish brown fine sandy loam 15 inches thick. Hard, unweathered bedrock is at a depth of 17 inches.

Typically, the Charlton soil has a very dark grayish brown, fine sandy loam surface layer 3 inches thick. The subsoil is dark yellowish brown, yellowish brown, and light olive brown fine sandy loam 26 inches thick. The substratum is grayish brown fine sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of well drained Canton and Narragansett soils, moderately well drained Sutton soils, and poorly drained Leicester soils. Many small areas have bedrock at a depth of 20 to 40 inches. A few small areas in the northwestern part of the county have a redder color in the subsoil.

Permeability of the Hollis soil is moderate or moderately rapid above the bedrock. The available water capacity is low. Runoff is medium or rapid. Hollis soil warms up and dries out rapidly in the spring. It is strongly acid or medium acid.

Permeability of the Charlton soil is moderate or moderately rapid. The available water capacity is moderate. Runoff is medium or rapid. Charlton soil warms up and dries out rapidly in the spring. It is strongly acid or medium acid.

The major limiting factors or community development are the shallow depth to bedrock in many places, and Rock outcrop. Extensive onsite investigations are often needed to locate a suitable site for onsite septic systems. Onsite septic systems need careful design and installation to prevent effluent from seeping to the surface in the areas downslope from the leaching system. Stones and boulders need to be removed for landscaping. The Hollis soil is droughty. Rock outcrops provide an attractive setting for homes in many places. Excavations require blasting in many places. Quickly establishing a plant cover and using mulch and netting, temporary diversions, and sediment basins help to control erosion during construction.

HrD--Hollis-Charlton-Rock outcrop complex, 15 to 45 percent slopes. This moderately steep to very steep complex consists of somewhat excessively drained and well drained soils and Rock outcrop on glacial till uplands. Stones and boulders cover 1 to 8 percent of the surface.

The soils and Rock outcrop in this complex are so intermingled on the landscape that it was not practical to separate them in mapping at the scale used. This complex is about 40 percent Hollis soil, 25 percent Charlton soil, 20 percent Rock outcrop, and 15 percent other soils.

Typically, the Hollis soil has a very dark brown, fine sandy loam surface layer 2 inches thick. The subsoil is dark brown and dark yellowish brown fine sandy loam 15 inches thick. Hard, unweathered bedrock is at a depth of 17 inches.

Typically, the Charlton soil has a very dark grayish brown, fine sandy loam surface layer 3 inches thick. The subsoil is dark yellowish brown, yellowish brown, and

light olive brown fine sandy loam 26 inches thick. The substratum is grayish brown fine sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of well drained Canton and Narragansett soils. Also included are many small areas that have bedrock at a depth of 20 to 40 inches. A few small areas in the northwestern part of the county have redder colors in the subsoil.

Permeability of the Hollis soil is moderate or moderately rapid above the bedrock. The available water capacity is low. Runoff is rapid or very rapid. Hollis soil warms up and dries out rapidly in the spring. It is strongly acid or medium acid.

Permeability of the Charlton soil is moderate or moderately rapid. The available water capacity is moderate. Runoff is rapid or very rapid. Charlton soil warms up and dries out rapidly in the spring. It is strongly acid or medium acid.

The major limiting factors for community development are the steep slopes, shallow depth to bedrock, and Rock outcrop. Extensive onsite investigations are generally needed to locate suitable homesites. Onsite septic systems need careful design and installation to prevent effluent from seeping to the surface in areas downslope from the leaching system. Stones and boulders need to be removed for landscaping. Excavations require blasting in many places. Quickly establishing a plant cover and using mulch and netting, temporary diversions, and sediment basins help to reduce erosion during construction.

Rn--Ridgebury, Leicester, and Whitman extremely stony fine sandy loams. These nearly level, poorly drained and very poorly drained soils are in drainageways and depressions of glacial till upland hills, ridges, plains, and drumloidal landforms. Stones and boulders cover 8 to 25 percent of the surface. Slopes range from 0 to 3 percent.

The mapped acreage of this undifferentiated group is about 35 percent Ridgebury soil, 30 percent Leicester soil, 20 percent Whitman soil, and 15 percent other soils. Some mapped areas consist of one of these soils, and other areas consist of two or three. These soils were mapped together because there are no major differences in use and management.

Typically, this Ridgebury soil has a black, fine sandy loam surface layer 4 inches thick. The subsoil is gray and brown, mottled fine sandy loam 16 inches thick. The substratum is very firm, brittle, grayish brown, mottled sandy loam to a depth of 60 inches or more.

Typically, this Leicester soil has a very dark gray, fine sandy loam surface layer 6 inches thick. The subsoil is dark grayish brown, grayish brown, and pale olive, mottled fine sandy loam 26 inches thick. The substratum is light olive gray, mottled gravelly fine sandy loam to a depth of 60 inches or more.

Typically, this Whitman soil has a black, fine sandy loam surface layer 9 inches thick. The subsoil is dark grayish brown, mottled fine sandy loam 7 inches thick. The substratum is very firm, brittle, grayish brown, mottled fine sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of moderately well drained Rainbow, Sutton, and Woodbridge soils and very poorly drained Adrian and Palms soils. A few areas in the southeastern part of the county have a silt loam surfce layer and subsoil. Many small areas have fewer stones on the surfce.

The Ridgebury soil has a seasonal high water table at a depth of about 6 inches. Permeability is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. The available water capacity is moderate. Runoff is very slow or slow. Ridgebury soil warms up and dries out slowly in the spring. It is strongly acid through slightly acid.

The Leicester soil has a seasonal high water table at a depth of about 6 inches. permeability is moderate or moderately rapid. The available water capacity is moderate. Runoff is very slow or slow. Leicester soil warms up and dries out slowly in the spring. It is very strongly acid through medium acid.

The Whitman soil has a high water table at or near the surface for most of the year. Permeability is moderate or moderately rapid in the surfce layer and subsoil and slow or very slow in the substratum. The available water capacity is moderate. Runoff is very slow, or the soil is ponded. Whitman soil warms up and dries out very slowly. It is very strongly acid through slightly acid.

The major limiting factors for community development are the high water table and the slow or very slow permeability in the substrtum. Onsite septic systems need special design and installation, and sites generally require extensive filling. Slopes of excavated areas slump when wet. Foundation drains help to prevent wet basements. Stones and boulders need to be removed for landscaping. Quickly establishing a plant cover and using mulch, temporary diversions, and sediment basins help to control erosion during construction.

A detailed sediment and erosion control plan should be prepared and implemented prior to construction on this site. The sediment and erosion control measures shown on the preliminary plans were found to be inadequate by the Team soils expert. The New London County Soil and Water Conservation District/Soil Conservation Service staff will be available to aid the developers in preparing adequate sediment and erosion control plans for the site.

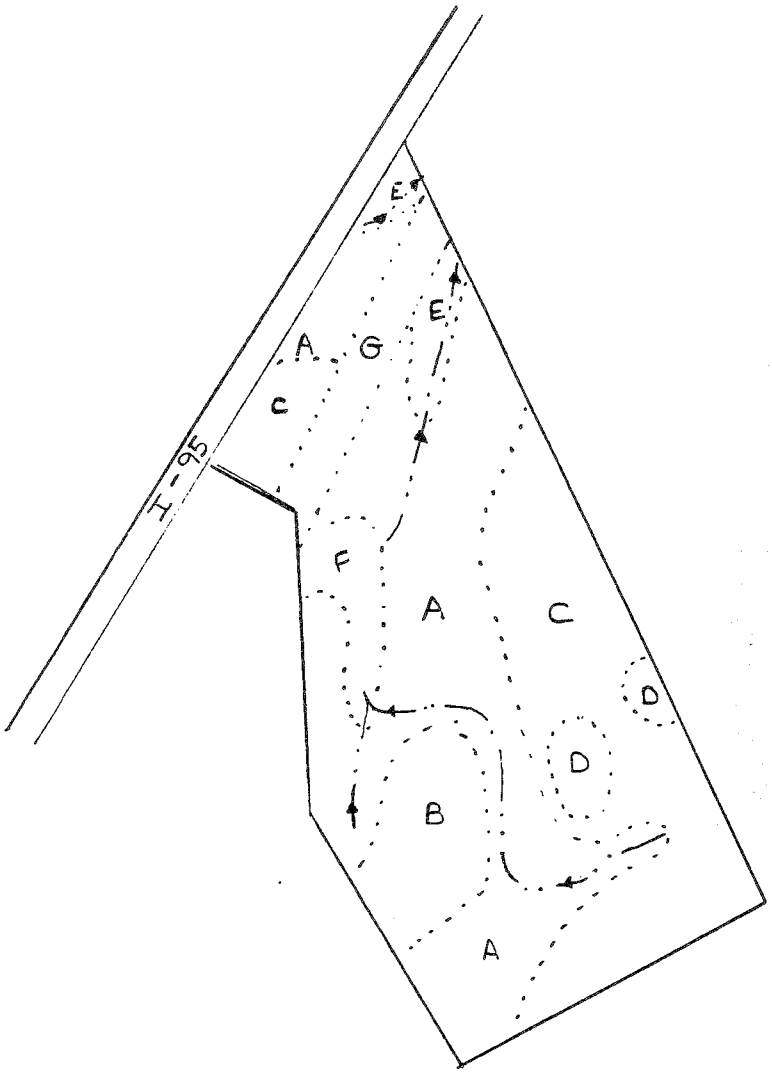
VEGETATION

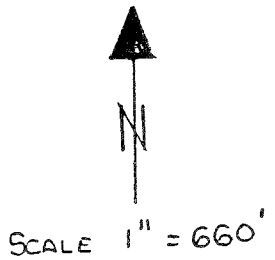
The vegetation of this woodland can be divided into seven vegetation types. These include four mixed hardwood stands, a hardwood swamp, an oak ridge stand, and a powerline/open land type. These are described in detail below and their locations are shown in the accompanying map.

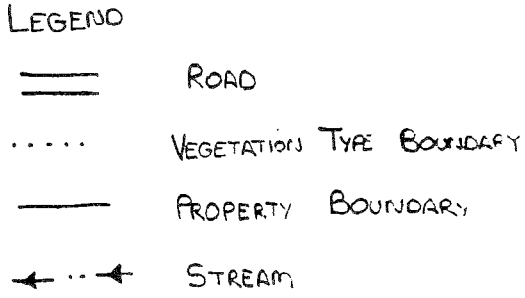
Vegetation type Descriptions

Type A (Mixed Hardwood) This 26 acre fully stocked stand is made up of medium quality sawtimber (tree 11.1" in diameter at breast height and larger - dbh) and of pole (trees 6.1" to 11.0" dbh) sized trees. The stand is located on an average growing site for hardwoods. Black oak, scarlet oak, white oak, chestnut oak, black

Vegetation







VEGETATION TYPE DESCRIPTION

Type A	Mixed Hardwoods, Fully stocked, pole and sawtimber size,	26 acres
Type B	Mixed Hardwoods, Understocked, Pole sized,	5 acres
Type C	Mixed Hardwoods, Fully stocked, Pole sized	19 acres
Type D	Oak Ridge, Understocked, Sapling size	2 acres
Type E	Mixed Hardwoods, Fully Stocked, Pole sized	2 acres
Type F	Hardwood Swamp, Fully Stocked, pole sized	2 acres
Type G	Powerline	4 acres

birch, yellow birch, beech, and red maple are the predominant species on the drier soils. Red oak, tulip poplar, white ash, sugar maple, and black gum replace scarlet and chestnut oaks in the moist drainage areas. The understory is dominated by mountain laurel with spicebush and sweet pepperbush occurring in the drainages. The stand is approaching maturity.

Type B (Mixed Hardwoods) This is a poor quality pole stand (5 acres) and is composed of scarlet oak, black oak, black birch, red maple, and American chestnut. Mountain laurel is the dominant understory vegetation. The recent harvest has left the stand understocked. The stand is approximately 100 years old and should be considered mature.

Type C (Mixed Hardwoods) This fully stocked stand (19 acres) contains poor quality pole sized trees. Black oak, scarlet oak, red maple, pignut hickory, chestnut oak, and white ash. The understory vegetation is composed of mountain laurel, lowbush blueberry, and huckleberry. The stand is 60 years old and should be considered immature. The shallow soil makes this area a poor hardwood growing site.

Type D (Oak Ridge) This stand (2 acres) consists of poor quality saplings (trees 1.1" to 6.0" dbh). Scarlet oak, black oak, and white oak comprise the tree species. Huckleberry and lowbush blueberry are among the understory vegetation. The stand is understocked with trees. The lack of soil (including exposed bedrock) makes this a very poor growing site.

Type E (Mixed Hardwoods) This is a fully stocked medium quality pole stand (2 acres). Red maple, red oak, black birch, white ash, yellow birch, sugar maple, beech, grey birch, sycamore, and black gum are present. The lesser understory vegetation is composed of mountain laurel and sweet pepperbush. The stand is approximately 50 years in age. The area represents a medium growing site for hardwoods.

Type F (Hardwood Swamp) This 2 acre poor quality poles stand is composed of red maple, black birch, and green ash. The lesser vegetation includes spicebush, sweet pepperbush, skunk cabbage, and greenbriar.

Type G (Powerline/Open Area) 4 acres.

Aesthetic Considerations

Large, healthy trees are usually considered aesthetically pleasing. The retention of these trees could add a considerable amount of aesthetic and shade value to residential areas. Tulip poplar, beech, and red oak would be good species to retain. Vegetation types A and E contain the healthiest tree specimens. These areas have the potential to grow the largest trees.

Construction activities should be planned and conducted to minimize the disturbances around the trees that are to be saved. Road building, filling, excavation, and general soil compaction may affect the aeration and moisture balance within the soil. This could lead to the decline in tree health and vigor and eventually lead to the death of the tree in three to five years. Physical damage to the root system and trunk of the tree by machinery may also result in the decline of individual trees.

The removal of a large percent of trees may have an adverse effect on the remaining trees. The sudden shock of being left in the open may be too much for a tree grown in the forest all its life. White oak in particular, has a high mortality rate once it suddenly experiences total exposure. Oak will sprout unsightly epicormic branches along its trunk when the trunk is exposed to direct sunlight. Trees left in the open are also more susceptible to damage from ice storms that may cause considerable crown breakage. Windthrow is also more prevalent in areas where a large percent of these trees have been removed. In general, healthy and high vigor trees should be retained since they are the best candidates to survive exposure and stress related to construction activity.

The retention of small undisturbed groups of trees would be aesthetically pleasing and would also minimize soil disturbance and mechanical injury to the trees within the group. It would be most appropriate to minimize construction activity and to retain most of the dominate trees in those areas designated as wetlands. (All of the vegetation Type F and part of Type A and E) The streams surrounded by a forest fringe would make a good aesthetic break and utilized one of the best landscaping assets on the property. These drainages (except in vegetation Type F) provides the best growing sites on the property; most of the dominant trees should be able to grow to 24" to 28" in diameter.

Most of this woodland tract is particularly susceptible to infestations by the gypsy moth because of its large component of oak and location on a dry ridge. Secondary agents such as two Line Chestnut borer and Armelia root rot are likely to follow defoliation by the gypsy moth and kill weakened trees. The mortality rate in vegetation Types A, B, C, and D is expected to increase over the years. Favoring the trees that the gypsy moth does not like to feed upon would make the area less susceptible to defoliation. Black birch, sugar maple, pignut hickory, red maple, white ash and tulip poplar are some of these.

Much of the mountain laurel should be retained for their aesthetic value and screening effect. The removal of overtopping trees will stimulate flowering of the mountain laurel.

Limiting Conditions/Potential Hazards

The overall condition of the trees on this property is adequate. There are only a few trees that have blatant advanced decay or other signs that suggest potential hazards. These trees can be easily identified and removed prior to construction. Fire scars are evident on trees in parts of vegetation Type A and C. Most of those trees do not show any open signs of advanced decay, although some decay has probably already begun. A good percent of the black birch is affected with Necteria canker. The formation of cankers on the trunk of these trees structurally weakens the trees and makes them more susceptible to breakage.

Windthrow is a potential hazard in parts of vegetation Type F, and also along the stream which passes through the property. Tree root depth is restricted by saturated soils. Saturated soils are also very plastic; shallow root systems and saturated soils make wetlands very susceptible to windthrow. Heavy harvesting of trees that produce openings in those saturated areas should be avoided since trees rely on each other for support. Light thinnings in these areas may help improve tree stability however.

Construction activities within wetlands which impede the natural drainage and raise water tables may have an adverse affect on the vegetation. Trees will decline in health and may eventually die if the water table is raised.

Management Considerations

The maintenance of healthy and vigorous trees should be a major concern in the development of this tract. Unhealthy trees are more susceptible to insects and disease problems. Trees that are not growing vigorously will decline in health and may eventually die.

Vegetation Types B, C, and D are understocked with healthy trees. The shallow soils in vegetation Types C and D make a poor growing site for hardwoods. The shallow soils are not able to meet the water and nutrients requirements of the hardwoods and, therefore, the trees are under stress and are in a state of decline. Conifers, which have lower requirements than hardwoods, would do better than hardwoods in vegetation Type C. Planting conifers on a 10' spacing, after the hardwoods are harvested, would produce a healthy conifer stand. Larch or white pine would be the most suitable conifers to plant. Underplanting conifers of a 20' spacing would help fill out the understocked stand in vegetation Type B. The lack of soil in vegetation Type D would make any attempt to plant conifers futile.

Vegetation Types A and E are not experiencing excessive crowding and would not normally need any treatment at this time. But, if these stands are planned to be opened up for development, it may be beneficial to have a commercial fuelwood thinning a few years prior to construction. This will allow the residual trees time to become wind firm and obtain larger tree crowns before construction begins. The thinning should concentrate on removing the understory trees and up to a third of the poorest overstory trees. Ideally, forty of the healthiest overstory trees per acre should be retained.

WILDLIFE

The majority of the 60 acre site is covered by hardwood forest with a medium to heavy understory of laurel (Kalmia latifolia). Some areas of the property are steep. Elevations range from 50 to 200 feet.

Latimer Brook runs through the northeastern corner of the property. There are several areas of wetlands along the western boundary of the property and in the central portion of the property.

Developing any small area by building on it will leave the majority of the area unavailable for wildlife to use.

Development will decrease the amount of habitat simply because the land will be occupied by physical building. The quality of the habitat will be decreased because an undeveloped area of land will be broken up with buildings and human activity.

Some species which require larger undeveloped areas will probably be forced out or will reduce their use of the area. They may be able to move into adjacent

undeveloped areas if there is suitable habitat available and the competition with other species already occupying the area is not too great.

Other species which are more adaptable to man's presence will probably remain. Some new species may even be attracted to the area.

If the following general wildlife recommendations are carried out, the impact to some species using the area can be lessened. The area may be made even more attractive to some species, such as songbirds.

1. Clearing - when the initial clearing for building is done, try to leave as many trees and shrubs as possible, especially those useful to wildlife. Some useful species include:

White oak (Quercus alba)
Red oak (Quercus rubra)
Black cherry (Prunus serotina)
Quaking aspen (Populus tremuloides)
Red-osier dogwood (Cornus stolonifera)
Apple (Malus spp.)

2. Landscaping - on a small acreage with many buildings, landscaping can do a great deal to provide habitat and make an area attractive to wildlife. First, leave as many trees as possible around the buildings. This will not only benefit wildlife by providing food, cover and nesting sites (especially for songbirds), but will also be more aesthetically pleasing for the residents of the development.

Leave as many snag trees (standing dead trees) and den trees (trees with holes) as possible. These trees are used by insect eating birds and cavity nesting birds and mammals.

Plant trees and shrubs which are useful to wildlife and landscaping, such as:

Japanese barberry (Berberis vulgaris)
Flowering dogwood (Cornus florida)
Honeysuckle (Lonicera spp.)
Juniper (Juniperus spp.)
Bayberry (Myrica pensylvanica)
Maple-leaved virburnum (Viburnum acerifolium)
Chokecherry (Prunus virginiana)
American Holly (Ilex opaca)
American mountain ash (Sorbus americana)
Autumn-olive (Elaegnus umbellata)
Winterberry (Ilex verticillata)
American cranberrybush (Viburnum trilobum)
Red maple (Acer rubrum)
Red-osier dogwood (Cornus stolonifera)
Alternate-leaf dogwood (Cornus alternifolia)

A variety of trees and shrubs should be used. Most species of wildlife need to have cover when they move from place to place. By leaving corridors of vegetation, this will allow wildlife to utilize the area and also have access to adjacent areas. Large expanses of lawn with no trees or shrubs present should be discouraged. These

factors will allow wildlife to better utilize the area and thus make it more attractive to wildlife.

3. Wetlands/Latimer Brook - prohibit development adjacent to the outlying wetlands. Wetlands are important areas for many species of wildlife because they provide food, cover and nesting areas. Any impact on them should be minimized.

WATER SUPPLY

According to Town officials, the municipal water supply line will be extended to service the proposed development.

WASTE DISPOSAL

The preliminary plans and specifications for this project have recently been submitted to DEP - Water Compliance Unit for review. As this proposed development would generate greater than 5,000 gallons per day of domestic sewage, a permit from DEP would be required.

As part of this permit process, the following will have to be documented prior to issuance of permit:

1. The site must have suitable land area to install the required size of leaching system based on the permeability and long-term acceptance rate of the soils.

2. The site must have sufficient permeability and depths to groundwater to prevent surface breakout.

3. The effluent must meet drinking water standards at the property line and/or nearest receiving stream.

To establish this information, the applicant will have to submit an engineering report based on site testing supervised by a Department of Environmental Protection representative. Very preliminary site testing has recently been supervised by Brian Curtis. Based on this data, the feasibility of further site testing and submittal of detailed engineering plans shall be studied.

PLANNING CONSIDERATIONS

Project Description

This is a multi-family development proposal located off of King Arthur Drive in East Lyme. The site is located south and east of route I-95 on the east side of the interchange between Route I-95 and Route 161. According to information listed on the preliminary plan, the site contains 61.2 acres. Zoning for the area is split between the CA District, a commercial district in which multi-family housing is allowed by Special Permit, and the RU-40 District, in which the principal permitted use is single-family housing at a density of 40,000 square feet per unit. The developers propose to build a total of seventy-two units on the portion of the property which is in the CA District,

in three phases of twenty-four units each. They have applied for a zone change for the remainder of the property from RU-40 to CA. If the zone change is granted, current plan are to build approximately forty units in this latter area. If the zone change is not granted, the area currently under RU-40 zoning will be developed with single-family houses. Since this area contains about seventeen acres, it would seem that it might be possible to construct about twelve to fourteen houses, if space necessary for access roads is taken into consideration.

Public water supply is available at the property, but on-site sewage disposal will be necessary, as discussed elsewhere in this report.

Traffic Impact

The proposed Southeastern Associates project is located at the end of King Arthur Drive, a dead-end road that joins with Route 161 directly opposite the eastbound off-ramp of Route I-95. Thus, any traffic that is generated on King Arthur Drive must utilize Route 161, and will tend to increase traffic volumbes on the latter thoroughfare.

The traffic impact of the project can be estimated from the number of dwelling units that are proposed. Phases I, II and III of Southeastern Associates' development are each proposed to contain twenty-four units, while it is contemplated that Phase IV will contain a maximum of forty units, for a possible total of 112 units. Data published by the Connecticut Department of Transportation* indicate that an apartment complex can be expected to generate 6.8 weekday trips per unit. Of this number, 8.0 percent can be expected to occur during the morning peak hour, and 10.2 percent during the afternoon peak hour. On this basis, a 112 unit project could be expected to generate 761 trips, of which 61 would take place during the morning peak hour and 77 during the evening peak hour.

Using the same criteria, the existing 96-unit Cedar Ridge Apartment complex on King Arthur Drive can be expected to generate 653 trips per day, of which 52 would take place during the morning peak hour and 66 during the evening peak hour.

Also located on King Arthur Drive is the 88-unit Susse Chalet Motel. According to the Connecticut Department of Transportation data mentioned above, a motel will, on the average, generate 12.8 trips per day per unit, or 1,126 trips. The data indicates that 8.4% of these, or ninety-four trips, will take place during the peak hour. Thus, for the two existing facilities on King Arthur Drive, the total number of weekday trips can be estimated to be 1,779 and the number of trips in the peak hour can be estimated at 66 plus 94 or 160. The 77 peak hour trips estimated to be generated by the Southeastern Associates' development would increase traffic on King Arthur Drive by about 48%.

* Trip Generation Study of Various Land Uses, Supplement A, by Israel Zevin, Connecticut Department of Transportation, 1975.

Of more importance, however, is the traffic impact of the project on Route 161. East Lyme's recent study of the impacts of the Millstone Nuclear Power Plant* gives weekday peak hour traffic volumes for the week of August 25, 1983, on Route 161 south of Industrial park road. The average southbound peak hour traffic from 4:00 to 5:00 PM was 922 vehicles. Northbound, on August 20th, it was 847 vehicles, also in the hour from 4:00 to 5:00 PM, giving a total for both directions of 1,769 vehicles. Connecticut Department of Transportation data published in April, 1979, give the capacity of Route 161 in the area between Society Road and Route I-95 as 1,250 vehicles per hour. Thus, based on available data, Route 161 is carrying a volume of traffic greater than its nominal capacity at the present time. The addition of 77 trips from the Southeastern Associates' project to the peak hour figure of 1,769 vehicles given above can only make a difficult situation worse than it is at the present time.

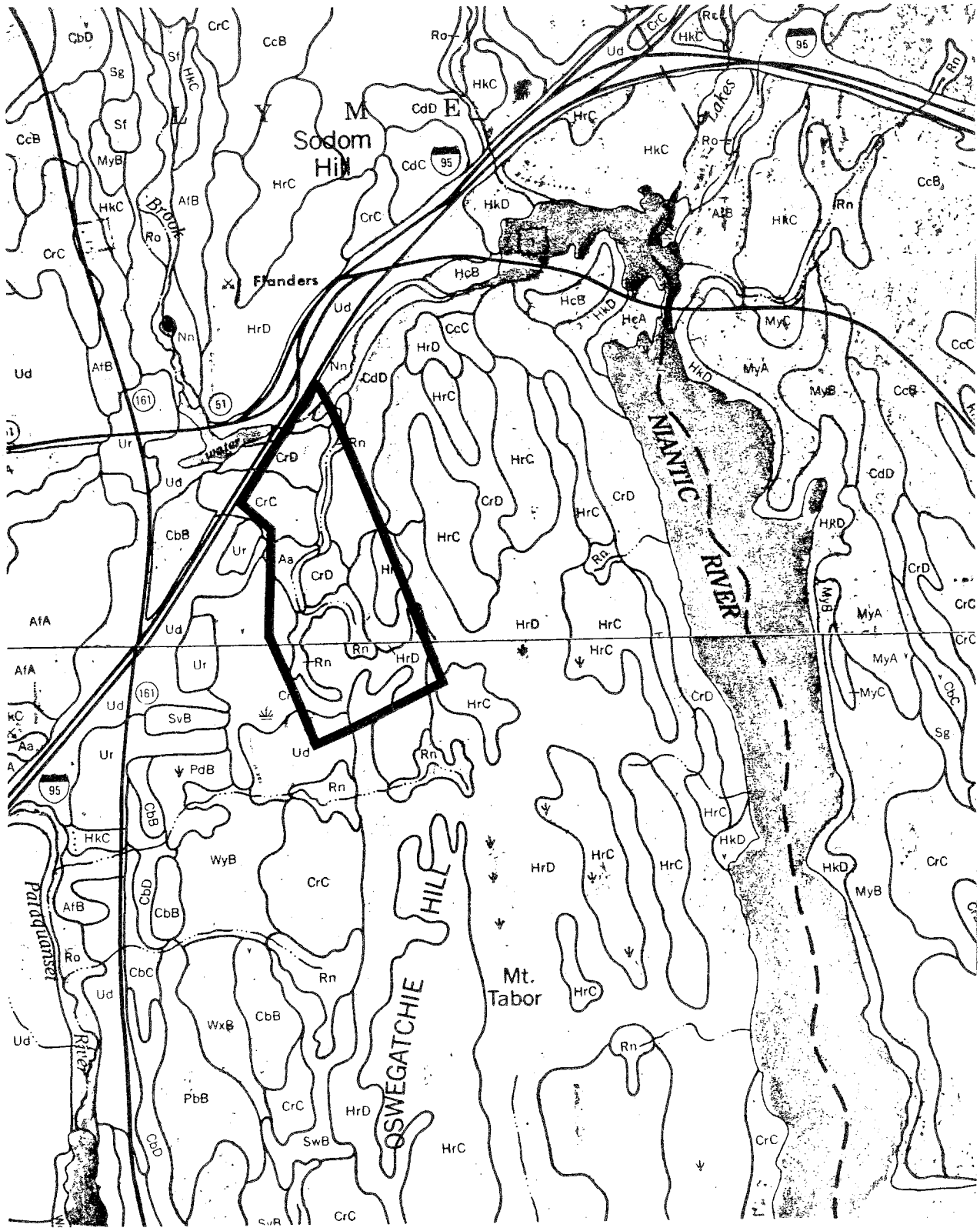
* Town of East Lyme Nuclear Energy Generation Impact Study, August, 1983, Peter L. Battles, AICP.

Appendix

Soils

0 1320'
scale

N



King Arthur Court, East Lyme

Soil Map Symbol	Soil Name	Lawns & Landscaping	Local Roads & Streets	High Water Table Depth-Kind-Months			Bedrock Depth
Aa *	Adrian	Severe-excess humus, ponding	Severe-ponding, low strength, frost action	+1-1.0'	Apparent	Nov-May	> 60"
	Palms			+1-1.0'	Apparent	Nov-May	> 60"
CrC	Charlton	Moderate-large stone, slope	Moderate-slope	> 6.0'	---	---	> 60"
	Hollis	Severe-thin layer	Severe-depth to rock	> 6.0'	---	---	10-20"
CrD	Charlton	Severe-slope	Severe-slope	> 6.0'	---	---	> 60"
	Hollis	Severe-slope thin layer	Severe-depth to rock slope	> 6.0'	---	---	10-20"
HrC	Hollis	Severe- thin layer	Severe-depth to rock	> 6.0'	---	---	10-20"
	Charlton	Moderate-large stones, slope	Moderate slope	> 6.0'	---	---	> 60"
HrD	Hollis	Severe-slope, thin layer	Severe-slope, depth to rock	> 6.0'	---	---	10-20"
	Charlton	Severe-slope	Severe-slope	> 6.0'	---	---	> 60"
Rn *	Ridgebury	Severe-wetness	Severe-wetness frost action	0-1.0'	Perched	Nov-May	> 60"
	Leicester	Severe-wetness	Severe-wetness frost action	0-1.0'	Apparent	Nov-May	> 60"
	Whitman	Severe-ponding	Severe-frost action, ponding	+1-0.5'	Perched	Sept-June	> 60"

* = Designated inland wetland soil by Public Act 155

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 o 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 activitis. 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 (774-1253), Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, P.O. Box 198, Brooklyn, Connecticut 06234.