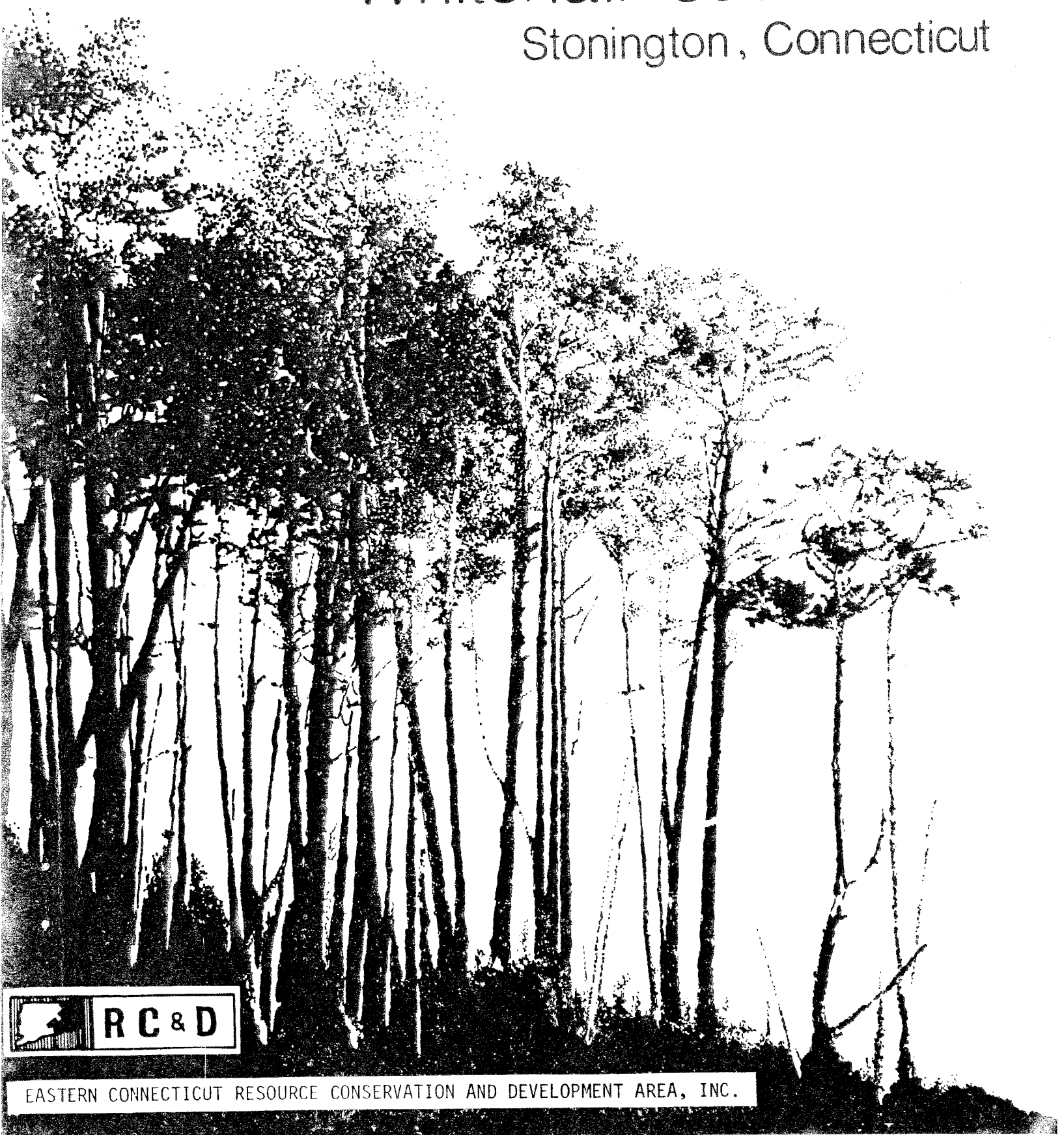
Environmental Review Team Report

Whitehall Subdivision

Stonington, Connecticut



RC&D

EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

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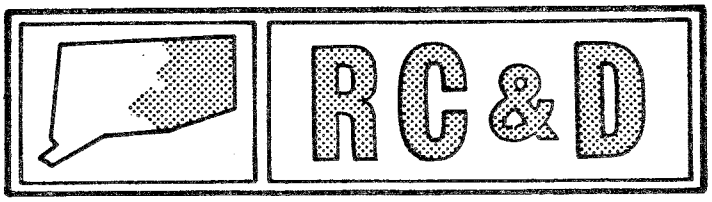
Stonington, Connecticut

March 1985



Eastern Connecticut Resource Conservation & Development Area

Environmental Review Team
PO Box 198
Brooklyn, Connecticut 06234

INTRODUCTION

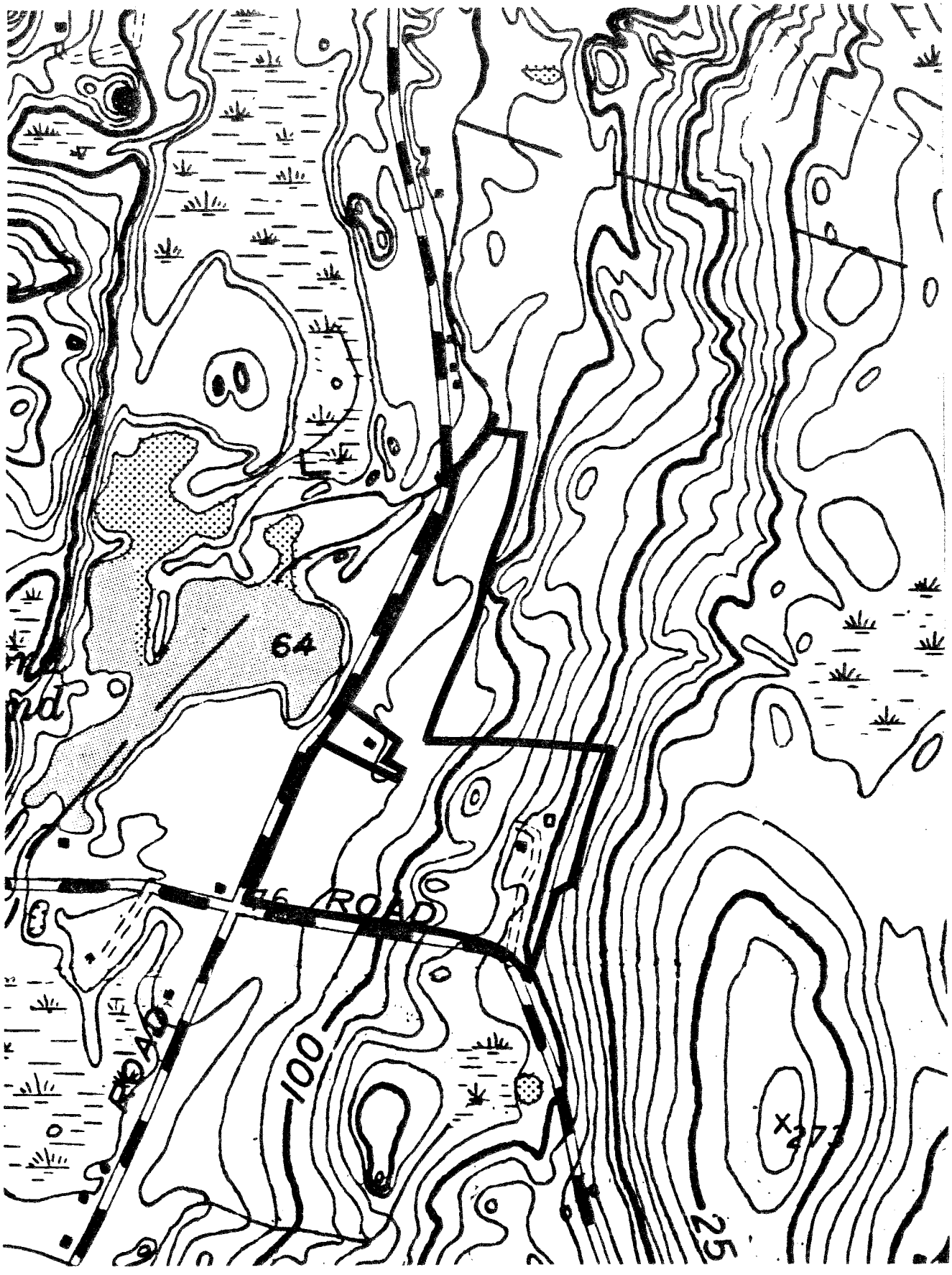
The Eastern Connecticut Environmental Review Team was asked to prepare an environmental assessment for a proposed subdivision in the Town of Stonington. The site is approximately 37 acres in size and is located at the intersection of Lantern Hill Road and Wolf Neck Road, near the Stonington/Ledyard town boundary line. Whitehall-Wolf Neck Associates are the present owners of the property. Preliminary plans have been prepared by DiCesare-Bentley Engineers, Inc.

Preliminary plans show the parcel divided into ten lots ranging from 1.6 acres to 6.9 acres in size. Each lot will be served by on-site septic systems and on-site wells. All lots have frontage on or access to a town road. A four acre open space area has also been included in the proposed design concept.

The site has relatively flat to gently sloping topography. There are several open fields along Lantern Hill Road which have recently been put to agricultural use. The remainder of the parcel is forested. Soils on the site range from regulated wetland soils, near the intermittent stream, to rapidly permeable soils. A portion of several proposed lots lies in the 100 year flood hazard zone.

The Team is concerned with the effect of this proposed development on the natural resource base of this site. Although many severe limitations to development can be overcome with proper engineering techniques, these measures can become costly, making a project financially unfeasible for a developer. Major concerns noted by Team members include wetland soil areas, areas of shallow soil depth to bedrock, rapidly permeable soils and flood hazard areas. These site limitations relate directly to potential difficulties in siting homes, septic systems and wells. These concerns are discussed in detail in the following sections of this report. It was also noted that Whitehall-Wolf Neck Associates, at the time of the field review, was not planning on doing the actual construction of homes on this site, but was planning to pursue the subdivision of land and subsequently would be selling off lots to individual purchasers who would then construct a home on each lot. This may be of concern to local officials in trying to assure compliance with local regulations. It would also be appropriate to notify potential landowners in this subdivision that an environmental assessment was prepared for this property and the information is available to help them plan for future development of each individual lot.

Topography	Site Boundary	0 660' scale	N



ENVIRONMENTAL ASSESSMENT

TOPOGRAPHY

The proposed subdivision is located in the northwest corner of Stonington. It occupies a ±36 acre tract of land situated at the intersection of Lantern Hill Road and Wolf Neck Road.

The topographic relief of the site, as shown in the accompanying topographic map slopes moderately from the east to a broad, gently rolling terrain which parallels Lantern Hill Road. The gently sloping areas are comprised primarily of open fields and/or cultivated land while the moderately sloping areas are comprised of woodland. Maximum and minimum elevations on the site are approximately 170 feet and 80 feet above mean sea level, respectively.

The major streamcourse on the site, Whitford Brook, parallels the western boundary of lot 10 in the northern parts. Several intermittent drainage channels traverse the site enroute to Whitford Pond. A band of wetland soils, along with its accompanying intermittent drainage channel flows southward through lots 5 and 6 and ultimately drains into a wetland area located southwest of the site (west side of Lantern Hill Road). Whitford Brook flows southwestward through this wetland system.

GEOLOGY

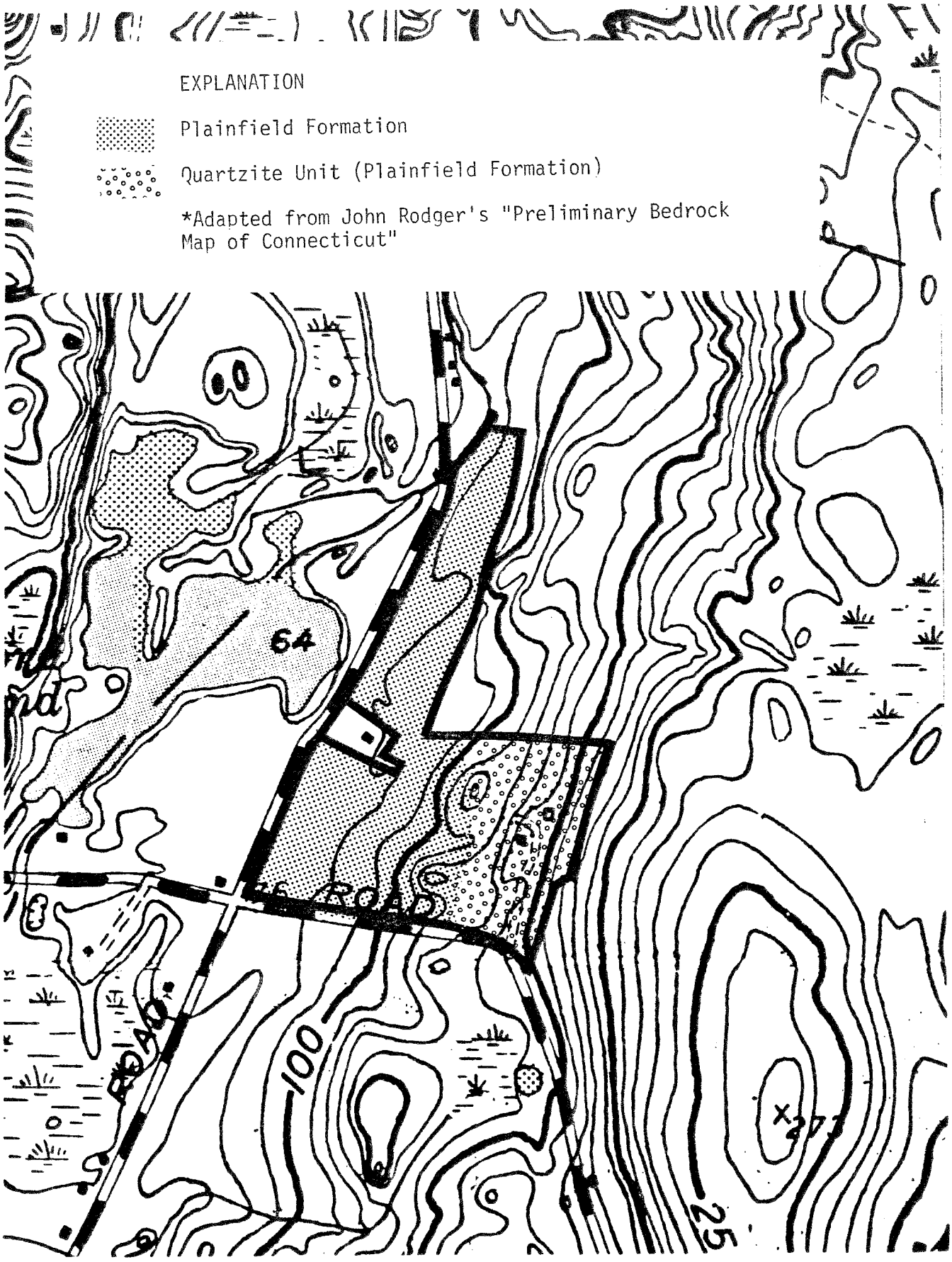
The proposed subdivision is located within the Old Mystic topographic quadrangle. Bedrock and surficial geologic maps for the quadrangle have not been published to date. However, there is preliminary information on file for both maps at the Department of Environmental Protection's Natural Resource Center in Hartford. It should be noted that the Preliminary Bedrock Geological Map of Connecticut, by John Rodgers, and the soil survey for New London County were referenced for writing this report.

The rock types underlying the site are interpreted to be the Plainfield Formation and the quartzite unit in the Plainfield Formation. The Plainfield Formation, which underlies the central and western parts of the site consists of an interlayered thinly bedded quartzite, mica schist and dark gray gneiss. The quartzite unit in the Plainfield Formation consists of a light gray glossy, generally thin bedded quartzite. It underlies or crops out in the eastern portions of the property. The terms "gneiss," "schist" and "quartzite" mentioned above related to the textural and structural aspects of the rocks. A "gneiss" is a rock in which bands of elongate minerals alternate with bands of minerals

Bedrock Geology

0 660' scale

N



having a rounder or blockier shape. A "schist" is a layered rock that parts relatively easily along surfaces of mineral alignment. Finally, a "quartzite" is a light colored granular (equal grain size) rock composed essentially of the mineral quartz. All of these rocks are crystalline metamorphic rocks (rocks geologically altered by great heat or temperature). Because of the snow cover on the site during the field review, rock outcrops were not easily visible. According to the project engineer, areas where bedrock is at or near ground surface is primarily in the area designated as Open Space.

The eastern or upland sections of the site are covered by a relatively thin blanket of glacial sediment called till. Till, which was deposited directly by glacier ice is composed of rock particles and fragments of widely varying sizes and shapes. The texture of till is generally sandy in the upper few feet; however, at depth it may become finer grained and more compact. Also, the presence of numerous surface boulders are common with till based soils on the site. Thicknesses of the till soils on the site range from zero in rock outcrop areas, to probably not much more than ten feet.

Another type of glacial sediment found throughout the western half of the parcel is the sand and gravel deposit (stratified drift). These sediments were laid down by meltwater streams from the glacier ice in the former Mystic River valley. These sediments are designated by the symbols NaB (Narragansett), Ts (Tisbury), and HcA (Haven) on the accompanying soils map. Thicknesses of the stratified drift deposits on the site range from a few inches at the till/stratified drift contact to probably not much more than 40 feet (Source: Connecticut Water Resources Bulletin #15).

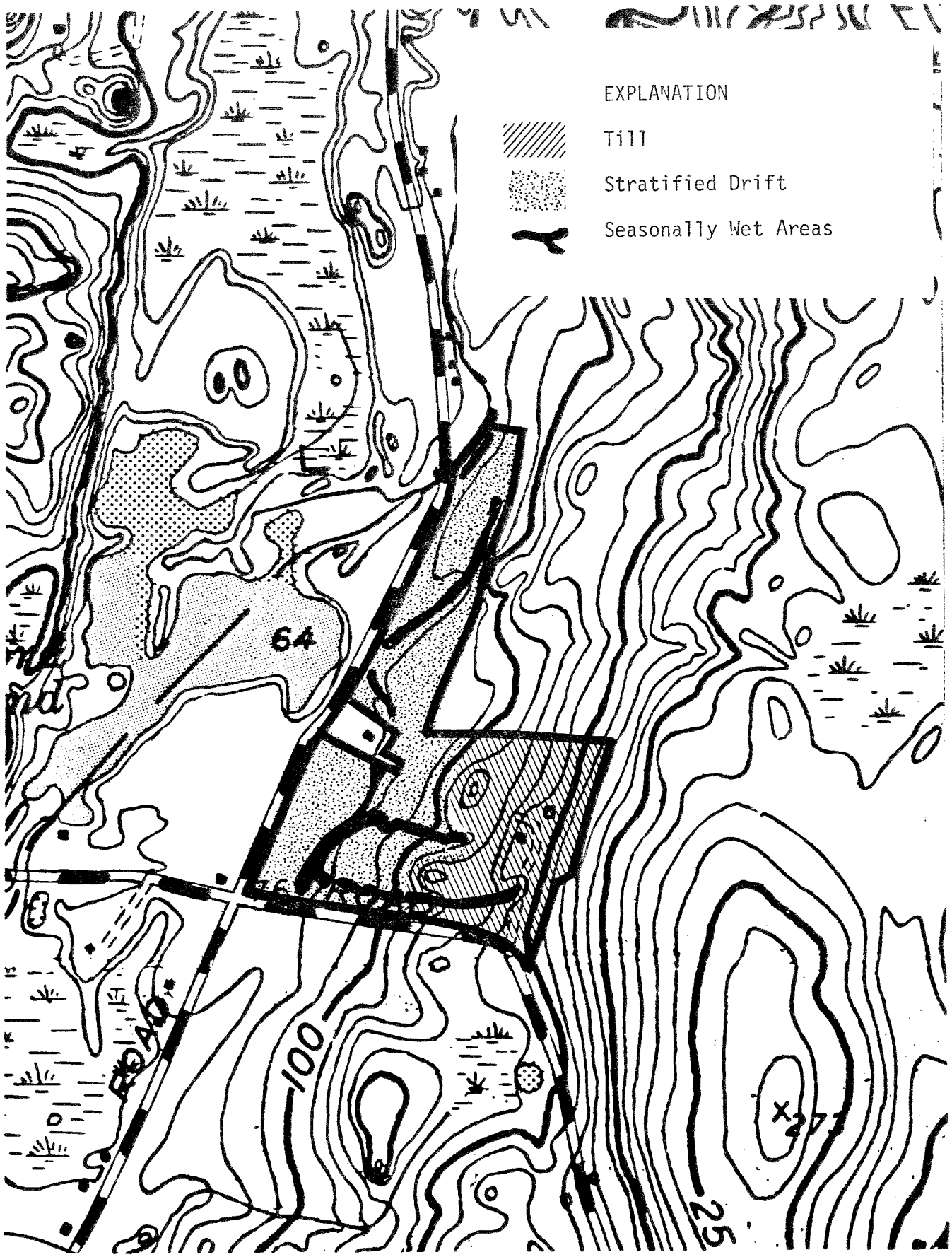
Based on the site plan distributed to Team members on the field review day, there are wetland soils overlying till and/or stratified drift along intermittent drainage channels throughout the site. The largest wetland area is found on lots 5 and 6. The remaining wetland areas are relatively narrow bands which parallel the intermittent watercourses on the site. It is understood that wetland soils on the property have been flagged by a certified soil scientist. Wetland boundaries should be superimposed onto the final subdivision plan map. This should help contractors working on each site.

Development Concerns

Based on visual observations, the most recent deep test hole data provided by the project engineer, and available surficial, bedrock, and soil mapping, the major geological limitations which may pose constraints with respect to the proposed subdivision include: (1) the presence of inland-wetland soils on some lots; (2) the presence of sandy/gravelly soils which have a tendency of having rapid percolation rates and in some areas, particularly the areas covered by Ts and HcA soils on the soils map, may have seasonally high ground water tables associated with them; and (3) moderately sloping areas.

These geologic limitations will weigh heaviest in the installation of on-site subsurface sewage disposal systems which will be required for each lot. These limitations will also pose constraints in terms of foundation placement, road and driveway construction.

Surficial Geology



In terms of subsurface sewage disposal system, properly engineered and installed septic systems may be able to surmount the above mentioned limitations in many instances. Careful planning and testing is imperative on each lot so that septic system problems do not arise. In areas where seasonally high ground water tables predominate such as areas covered by Haven and Tisbury soils, leaching systems should be located on upland areas rather than in low topographic depressions and be kept elevated as much as possible above the groundwater table. Also, they should be kept spread out.

Due to the highly porous nature of the sand and gravel, pollutants such as sewage effluent may find their way into the ground and have little opportunity to be renovated by the soil component before reaching the ground water table. It should be pointed out that natural dilution by infiltrating rainfall will be increased, however. As a result, where percolation rates are found to be faster than one minute per inch, it may be necessary to increase the lateral separating distances between septic system(s) and on-site well(s) as well as neighboring wells to minimize the chance of potential problems.

Concern was expressed by the town planner at the Team's pre-review meeting as to whether or not an existing dug well serving a home west of lot 5 and a spring serving the Avery residence west of lot 4 would be adversely affected by septic effluent from the new sewage disposal systems. According to the project engineer, groundwater monitoring wells have been installed on lots 4 and 5 in order to determine the direction and rate of groundwater movement. Once this has been adequately determined, every effort should be made to cautiously locate the proposed leaching systems serving these lots in an area where groundwater movement is away from the above mentioned water supplies. In addition, based on the new leaching field locations for lots 4 and 5 discussed during the field review, it appears that large separating distances (150-200 feet) can be maintained between the wells and the proposed leaching systems. This would, hopefully, further protect the wells from possible contamination by sewage disposal systems. If properly addressed, it seems likely that lots 4 and 5 could be developed without contaminating the wells mentioned earlier.

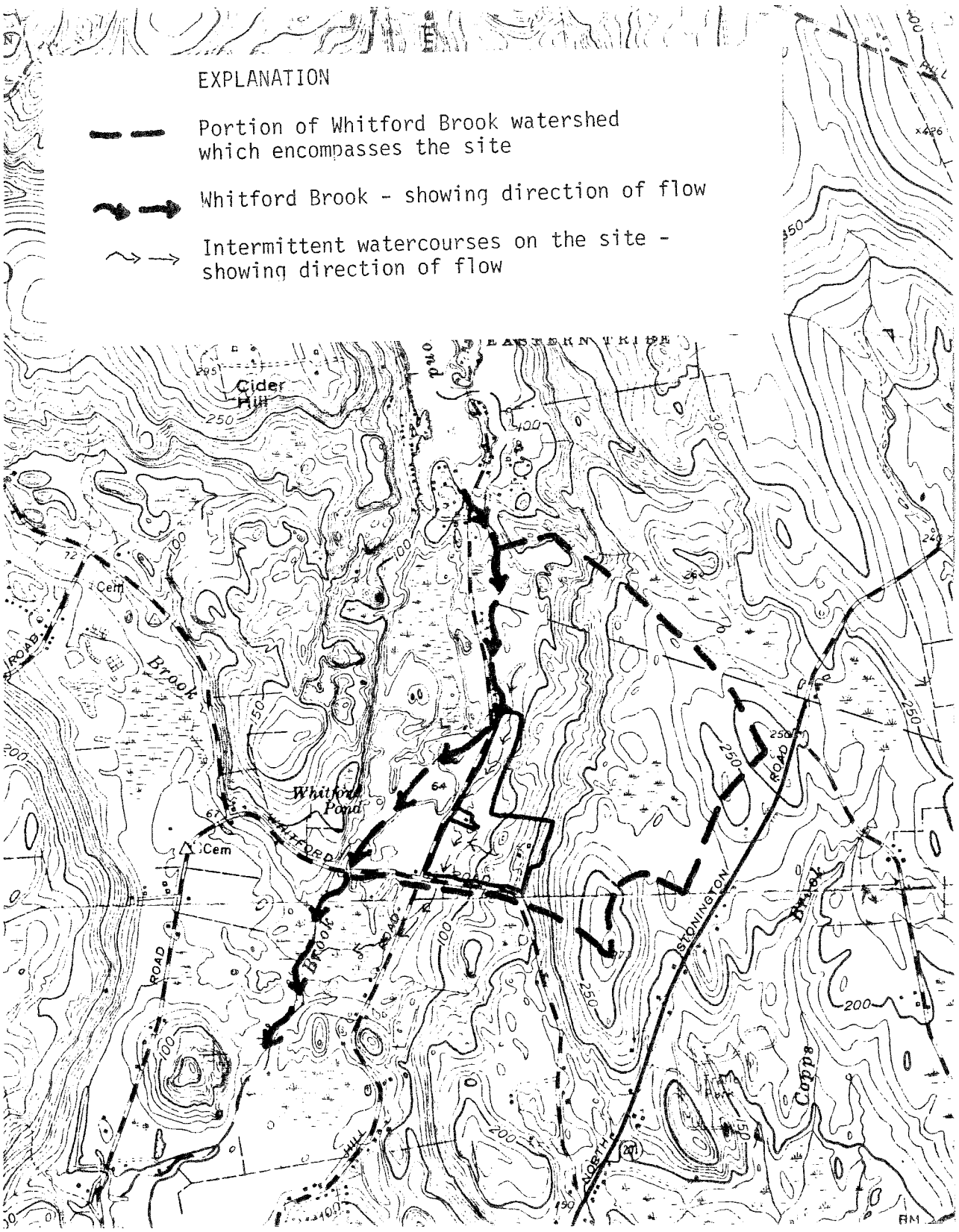
The designated inland-wetland soils on the site are regulated in Connecticut under Public Act 155. Any activity which involves modification, filling, removal of soils, etc., will require a permit and ultimate approval by the town's Inland-Wetland Commission. The wetland areas on the site hold little potential for development and, therefore, it is recommended that development in these areas be avoided.

Based on the site plan distributed to Team members on the review day, approximately 40 feet of inland-wetland soils will need to be crossed in order to provide access to lots 4, 7, and 8. Although undesirable, wetland road crossing are feasible provided they are properly engineered. The road should be constructed adequately above the surface elevation of the wetlands. This will allow for better drainage of the road and also decrease the frost heaving potential of the road. Road construction through wetlands should preferably be done during the dry time of the year and should include provisions for effective erosion and sediment control. Finally, culvert(s) must be properly sized and located so as not to alter the water levels in the wetland or cause flooding problems.

Drainage Areas

0 660'
Scale

N



HYDROLOGY

The entire site lies within the watershed of Whitford Brook which flows along the western boundary of lot 10. Surface runoff from most of the site flows downslope towards discharge points, i.e., intermittent streamcourses, wetlands, ponds, etc. Water is then transported via streamcourses towards Whitford Pond.

Surface drainage in the southern portion flows downslope into the wetland area which traverses lots 5 and 6. Water then flows southwestward, passing under Wolf Neck Road and Lantern Hill Road ultimately emptying into a wetland area which parallels Whitford Brook. Whitford Brook ultimately empties into the Mystic River, south of the site. Several intermittent watercourses traverse the parcel enroute to Whitford Brook.

The subdivision of the property as planned, followed by the construction of new homes and driveways (if paved), will lead to some increases in runoff from the site. Ordinarily the Team would recommend that consideration be given to measures which would mitigate the effects of those increases. For example, stream flows are often increased during storms following construction in a particular stream's watershed. In this case, however, the overall density of the subdivision is relatively small so that peak flow increase would probably be negligible. In addition, Whitford Pond as well as small inland-wetland areas and other small surface water bodies nearby will serve as a natural runoff control basin. Under these circumstances, runoff retention does not seem to be necessary. Since much of the watershed draining the property is undeveloped at the present time, there is a possibility that a series of developments could occur which, taken together, could create significant increases to the flood flows of their respective streamcourses and ultimately, Whitford Brook. However, since the upper parts of the watershed comprise the Mashantucket Land Trust Property, it seems likely that development would only be possible at a low density. Nevertheless, it is advised that each developer do his part to prevent a cumulative impact, particularly where a development is dense.

It is strongly recommended that the project engineer closely examine the 18" and 15" culverts passing under Lantern Hill Road in front of the Avery residence and lot 7, respectively, to ensure that they can handle post development flows.

As mentioned earlier, slopes in the eastern portion are moderate. For this reason, every effort should be made to prevent potential erosion and siltation problems, particularly near wells, streamcourses, as well as Whitford Pond and Brook. Therefore, it is recommended that a comprehensive erosion and sediment control plan be developed covering each stage of the proposed subdivision since increased runoff from developed areas may cause streambank erosion and gullying ultimately causing siltation problems to downstream areas. All erosion and sediment control measures should be shown on the subdivision plan which receives final approval.

Flood Hazard Areas

According to the Flood Insurance Rate Map for Stonington, which was prepared by the Federal Emergency Management Agency, a ±100 foot wide area astride Whitford Brook on lot 10 lies within the 100-year flood boundary. The house, well, and sewage disposal system on this lot should be located outside of this area, if possible. If the house is located within the 100-year flood boundary, compliance of all town building codes for regulations pertaining to flooding will be required.

SOILS

Soil series typical of this site include the Canton-Charlton series, the Haven series, the Narragansett series, the Ridgebury, Leicester and Whitman complex and the Sutton series. These soils and their properties are descirbed in detail below.

(CbD)-Canton and Charlton fine sandy loams, 15 to 25 percent slopes. These moderately steep, well drained soils are on glacial till upland hills, plains, and ridges.

The mapped acreage of this undifferentiated group is about 55 percent Canton soil, 25 percent Charlton soil, and 20 percent other soils. Mapped areas consist of either Canton soil or Charlton soil, or both. These soils were mapped together because there are no major differences in use and management.

Typically, the Canton soil has a very dark grayish brown, fine sandy loam surface layer 6 inches thick. The subsoil is dark yellowish brown fine sandy loam and sandy loam 18 inches thick. The substratum is grayish brown gravelly sand to a depth of 60 inches or more.

Typically, the Charlton soil has a very dark grayish brown, fine sandy loam surface layer 6 inches thick. The subsoil is dark yellowish brown, yellowish brown, and light olive brown fine sandy loam 23 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 Narragansett, Paxton, and Montauk soils.

Permeability of the Canton soil is moderately rapid in the surface layer and subsoil and rapid in the substratum. The available water capacity is moderate. Runoff is very rapid. This soil warms up and dries out rapidly in the spring. Unless limed, the soil is strongly acid or medium acid.

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

Soils	0 1320' scale	N

The major limiting factor for community development is steepness of slope. On-site septic systems need special design and installation to prevent seepage of effluent to the surface in areas of downslope from the leaching system. Quickly establishing a plant cover and using mulch and netting, temporary diversions, and sediment basins help to control erosion during construction.

CdC-Canton and Charlton extremely stony fine sandy loams, 3 to 15 percent slopes. These gently sloping and sloping, well drained soils are on glacial till upland hills, plains, and ridges. Stones and boulders cover 8 to 25 percent of the surface.

The mapped acreage of this undifferentiated group is about 55 percent Canton soil, 25 percent Charlton soil, and 20 percent other soils. Mapped areas consist of Canton soil or Charlton soil, or both. These soils were mapped together because there are no major differences in use and management.

Typically, the Canton soil has a black, fine sandy loam surface layer 1 inch thick. The subsoil is dark yellowish brown fine sandy loam and sandy loam 23 inches thick. The substratum is grayish brown gravelly sand to a depth of 60 inches or more.

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 Narragansett, Paxton, and Montauk soils; moderately well drained Sutton soils; and poorly drained Leicester soils.

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

On-site 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. Quickly establishing a plant cover and using mulch and netting, temporary diversions, and sediment basins help to control erosion during construction.

(HcB)-Haven silt loam, 3 to 8 percent slopes. This gently sloping, well drained soil is on stream terraces and outwash plains.

Typically, this Haven soil has a dark brown, silt loam surface layer 7 inches thick. The subsoil is brown, yellowish brown, and dark yellowish brown

silt loam 16 inches thick. The substratum is light yellowish brown very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Hinckley soils, well drained Agawam soils, and moderately well drained Ninigret and Tisbury soils. A few areas have a gravelly surface layer and subsoil. Included areas make up about 15 percent of this map unit.

Permeability of the Haven soil is moderate in the surface layer and subsoil and very rapid in the substratum. The available water capacity is high. Runoff is medium. Haven soil warms up and dries out rapidly in the spring. Unless limed, it is strongly acid or medium acid.

This soil is well suited to cultivated crops. The hazard of erosion is moderate. Minimum tillage and the use of cover crops help to control erosion.

This soil is suited to trees. Machine planting is practical.

On-site septic systems function with normal design installation, but they can pollute the groundwater in places. Slopes of excavated areas are unstable. Quickly establishing a plant cover and using mulch, temporary diversions, and sediment basins help to control erosion during construction.

(NaB)-Narragansett silt loam, 3 to 8 percent slopes. This gently sloping, well drained soil is on glacial till upland hills, ridges, and plains in the southeastern part of the county.

Typically, this Narragansett soil has a dark brown, silt loam surface layer 8 inches thick. The subsoil is dark yellowish brown and yellowish brown silt loam 20 inches thick. The substratum is light olive brown gravelly loamy coarse sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Charlton, Canton, and Broadbrook soils; moderately well drained Sutton soils; and poorly drained Leicester soils. Included areas make up about 15 percent of this map unit.

Permeability of the Narragansett soil is moderate in the surface layer and subsoil and moderately rapid or rapid in the substratum. The available water capacity is high. Runoff is medium. Narragansett soil warms up and dries out rapidly in the spring. Unless limed, it is very strongly acid through medium acid.

This soil is well suited to cultivated crops. The hazard of erosion is moderate. Minimum tillage and the use of cover crops help to control erosion.

This soil is suited to trees. Machine planting is practical.

This soil is suited to community development. Quickly establishing a plant cover and using mulch, temporary diversions, and sediment basins help to control 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 surface layer and subsoil. Many small areas have fewer stones on the surface.

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 surface 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.

These soils are not suited to cultivated crops. Stoniness makes the use of farming equipment impractical. The erosion hazard is slight. Maintaining a permanent plant cover helps to control erosion.

These soils are suited to trees. Stoniness makes the use of machine planting impractical, and woodland roads are difficult to construct in most places. Windthrow is common because of the shallow rooting depth above the high water table.

The major limiting factors for community development are the high water table and the slow or very slow permeability in the substratum. On-site 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.

(SxB)-Sutton extremely stony fine sandy loam, 0 to 8 percent slopes. This nearly level to gently sloping, moderately well drained soil is on upland glacial till plains, hills, and ridges. Stones and boulders cover 8 to 25 percent of the surface.

Typically, this Sutton soil has a very dark grayish brown, fine sandy loam surface layer 4 inches thick. The subsoil is yellowish brown, dark yellowish brown, and dark brown, mottled fine sandy loam and sandy loam 29 inches thick. The substratum is olive brown, mottled sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Canton, Charlton, and Narragansett soils; moderately well drained Woodbridge and Rainbow soils; and poorly drained Leicester soils. A few areas in the southeastern part of the county have a silt loam surface layer and subsoil. Included areas make up about 10 percent of this map unit.

The Sutton soil has a seasonal high water table at a depth of about 18 inches. Permeability is moderate or moderately rapid. The available water capacity is moderate. Runoff is slow or medium. Sutton soil warms up and dries out slowly in the spring. It is strongly acid or medium acid in the surface layer and subsoil and strongly acid through slightly acid in the substratum.

This soil is not suited to cultivated crops because stoniness makes the use of farming equipment impractical. The hazard of erosion is slight or moderate. Maintaining a permanent plant cover helps to control erosion.

This soil is suited to trees. However, stones and boulders make machine planting impractical in most areas.

The major limiting factor for community development is the seasonal high water table. On-site septic systems need special design and installation to prevent effluent from seeping to the surface. 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.

Sediment and Erosion Control

A detailed Sediment and Erosion Control Plan should be prepared consisting of the following:

A. A narrative describing:

1. the development;

2. the schedule for grading and construction activities including;

   a. start and completion dates;
   b. sequence of grading and construction activities;
   c. sequence for installation and/or application of soil erosion and sediment control measures;
   d. sequence for final stabilization of the project site;

3. the design criteria for proposed soil erosion and sediment control measures and storm water management facilities;

4. the construction details for proposed soil erosion and sediment control measures and storm water management facilities;

5. the installation and/or application procedures for proposed soil erosion and sediment control measures and storm water management facilities;

6. the operations maintenance program for proposed soil erosion and sediment control measures and storm water management facilities.

B. A site plan map at a sufficient scale to show:

1. the location of the proposed development and adjacent properties;

2. the existing and proposed topography including soil types, wetlands, watercourses and water bodies;

3. the existing structures on the project site, if any;

4. the proposed area alterations including cleared, excavated, filled or graded areas and proposed structures, utilities, roads and, if applicable, new property lines;

5. the location of the design details for all proposed soil erosion and sediment control measures and storm water management facilities;

6. the sequence for grading and construction activities;

7. the sequence for installation and/or application of soil erosion and sediment control measures;

8. the sequence for final stabilization of the development site.

In addition, it should be noted that most of the lots along Lantern Hill Road are prime agricultural soils. If any part of this subdivision is to be open space, it is strongly suggested that these areas remain undeveloped instead of the area proposed. In addition, this would also provide better access to and complement the Mashantucket Land Trust property. The engineer stated that the planned open space was chosen because of difficulty with septic system construction. However, it should be noted that the Haven soils also have severe limitations for on-site septic fields because they are a poor filter material.

WATER SUPPLY

The water needs of each residential lot owner will be served by on-site wells. According to the "Groundwater Availability in Connecticut" map by Daniel B. Mead, the stratified drift deposits covering the western parts of the property astride Lantern Hill Road may be capable of yielding moderate to very large amounts of water. However, because there is a greater risk of well contamination if the stratified drift on the site is tapped, it is suggested bedrock based wells be provided. It is expected most of the homes constructed in the subdivision would only need well yields of about 3 gallons per minute (gpm).

Because the water is transmitted through the rock by means of interconnected fractures, and because the fractures are unevenly distributed, a well drilled in any particular location may intersect no fractures and be dry, or may intersect numerous fractures and be a high water producer. As a result, it is virtually impossible to predict the absolute yield of wells drilled at any given location. Approximately 90 percent of the bedrock-based wells evaluated in Connecticut Water Resources Bulltein No. 15 (Lower Thames and Southeastern Coastal River Basins) were capable of supplying at least 3 gpm.

In general, wells should be located to the high side of lots, properly separated from sewage disposal systems, other possible forms of pollution (fuel oil tanks, road or other salts) and protected from surface wash or flooding. It is noted that several of the nearest residents to the area are concerned that the development of the property would impair the quality of their groundwater supplies. These existing water supplies apparently are obtained from shallow and drilled wells in addition to a spring source (Avery). Recent water samples taken from several supplies have shown good water quality, although mineral concentrations (iron, manganese) were elevated. This would tend to indicate any new wells would probably need to have appropriate water treatment facilities for the removal of undesirable and excessive minerals.

Because there is indication that all or most of the lots along Lantern Hill Road are in an area where the underlying, deeper soil would tend to be quite permeable and probably would not afford the same degree of filtration and renovation of sewage, precautions should be taken to protect existing and proposed water supplies. If necessary, separating distances between wells and subsurface sewage systems should be increased from the minimum required 75 feet, possibly being doubled. This would depend upon the percolation rate and at what depth sewage systems would be installed. In general, keeping leaching

systems elevated and spread out as much as possible in soils that are highly permeable, particularly where groundwater is also relatively shallow, is very desirable.

To minimize the possible adverse affect on two existing water supplies (house southwest corner of the two roads and Avery's house on Lantern Hill Road), sewage systems should be offset from the well or water source so that drainage or groundwater movement would be away from such. This would be particularly important for Avery's spring supply, which is down gradient from one of the proposed lots (#4).

In general, wells of the drilled type which are adequately cased and sealed into underlying bedrock will provide good protection from possible pollution.

Experience has shown that where lots are an acre or larger in size and where the needed quantity of water withdrawn from wells and the volume of sewage discharged are both low, such as from single family dwellings, there should be no associated water quality problems.

WASTE DISPOSAL

Sewage disposal for the subdivision would be provided by means of on-site subsurface sewage disposal systems.

Based on visual observations, consideration of engineering test results and soil service mapping data, the major concerns for sewage disposal would be high groundwater conditions and rather permeable soil, favoring a fast percolation rate. It should be noted that no excessively fast percolation rate was reflected by the engineering test results. However, this would seem to be associated with the depth at which such tests were made. The less pervious material being in the upper layers while the more permeable soil was located at a somewhat greater depth. Subsequent to these findings, additional soil testing, including monitoring of groundwater elevation(s) and direction(s) of movement was undertaken by a consulting soil scientist. His findings and evaluation will also be presented as part of the subdivision application and review process.

With proper location, engineered design and careful installation, systems should be capable of functioning satisfactorily without having an adverse impact on water supplies or would any significant affect be anticipated on surface water.

Because of the location of an intermittent watercourse and possibly some wetlands, and consideration of a house location and other separating factors which impose limitations, lot 9 may need modification or should possibly be incorporated into adjoining lots.

PLANNING CONCERNS

Lot Layout

It is not the purpose of this report to provide suggestions for specific solutions to design problems. However, it is felt that two points should be mentioned. First, the preliminary plan shows a 10-foot wide right-of-way crossing lot 4 to connect the proposed open space area to the neighboring property of the Mashantucket Land Trust. It would seem that the value of lot 4 would be increased if the right-of-way could be located along a property line rather than bisecting the lot. This would require some readjustment of property lines. Also, a large part of lot 10 lies with an "A Zone" as shown on the town's Flood Insurance Rate Map. The suggestion has been made by the Town Planner that this problem, as well as that of the right-of-way through lot 4, could be solved by moving the open space to lots 9 and 10. This appears to be a good way of solving these problems. Also, the area currently proposed as open space appears more desirable as a building lot than are lots 9 and 10.

Circulation and Traffic

It appears that the subdivision is not large enough to have a significant impact on traffic on either Lantern Hill Road or Wolf Neck Road. However, access driveways should be mentioned. The plan shows a common access drive for lots 7 and 8. The original reason for this was to minimize impact on the intermittent stream which flows through these two lots. However, this scheme also reduces the number of access points to Lantern Hill Road. It would be beneficial if a similar scheme could be worked out for lots 9 and 10, and possibly for lots 5 and 6 as well, although in this latter case, a greater separation distance between driveways could be achieved by locating the driveway to lot 5 around the corner of Wolf Neck Road rather than on Lantern Hill Road.

The developer of these shared driveways should also be determined prior to final subdivision approval, as a discrepancy in information was noted at the field review. The developer's engineer stated that the individual lot owners would be constructing the shared driveways and the Team was later informed by the developer that he would be constructing the shared rights-of-way. Such information would be helpful in maintaining compliance with local and state regulations.

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.