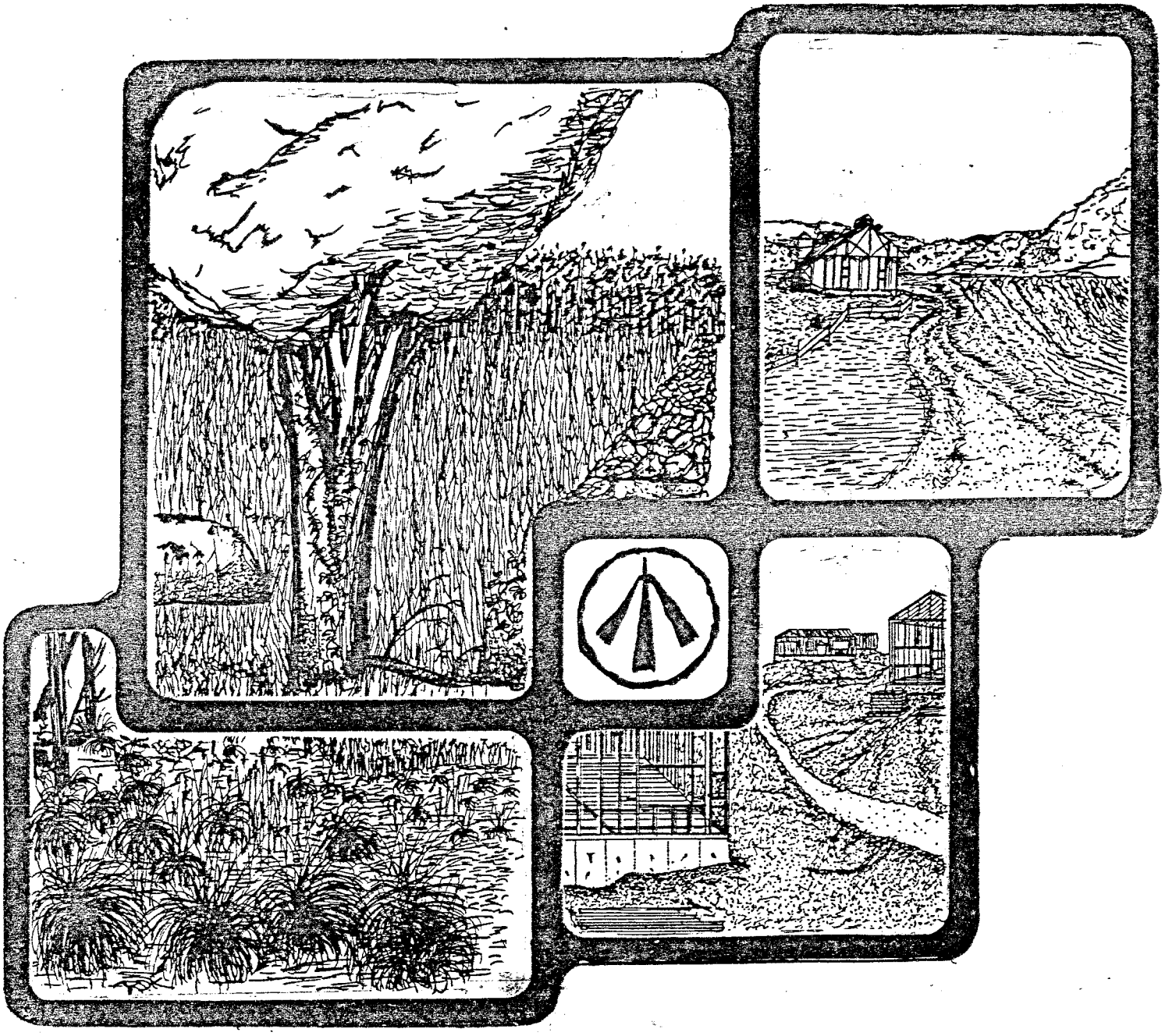
ENVIRONMENTAL REVIEW TEAM REPORT

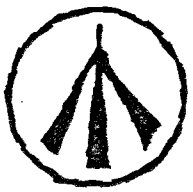


OLD FARM HILL SUBDIVISION
NEWTOWN, CT

KING'S MARK
RESOURCE CONSERVATION & DEVELOPMENT AREA

KING'S MARK
ENVIRONMENTAL REVIEW TEAM REPORT

OLD FARM HILL SUBDIVISION
NEWTOWN, CT
JULY 1984



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

Federal Agencies
U.S.D.A. Soil Conservation Service

State Agencies
Department of Environmental Protection
Department of Health
University of Connecticut Cooperative Extension Service
Department of Transportation

Local Groups and Agencies
Litchfield County Soil and Water Conservation District
New Haven County Soil and Water Conservation District
Hartford County Soil and Water Conservation District
Fairfield County Soil and Water Conservation District
Northwestern Connecticut Regional Planning Agency
Valley Regional Planning Agency
Central Naugatuck Valley Regional Planning Agency
Housatonic Valley Council of Elected Officials
Southwestern Regional Planning Agency
Greater Bridgeport Regional Planning Agency
Regional Planning Agency of South Central Connecticut
Central Connecticut Regional Planning Agency
American Indian Archaeological Institute
Housatonic Valley Association

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FUNDING PROVIDED BY
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Jamie Whitman, ERT Cartographer
Jamie Whitman, Secretary

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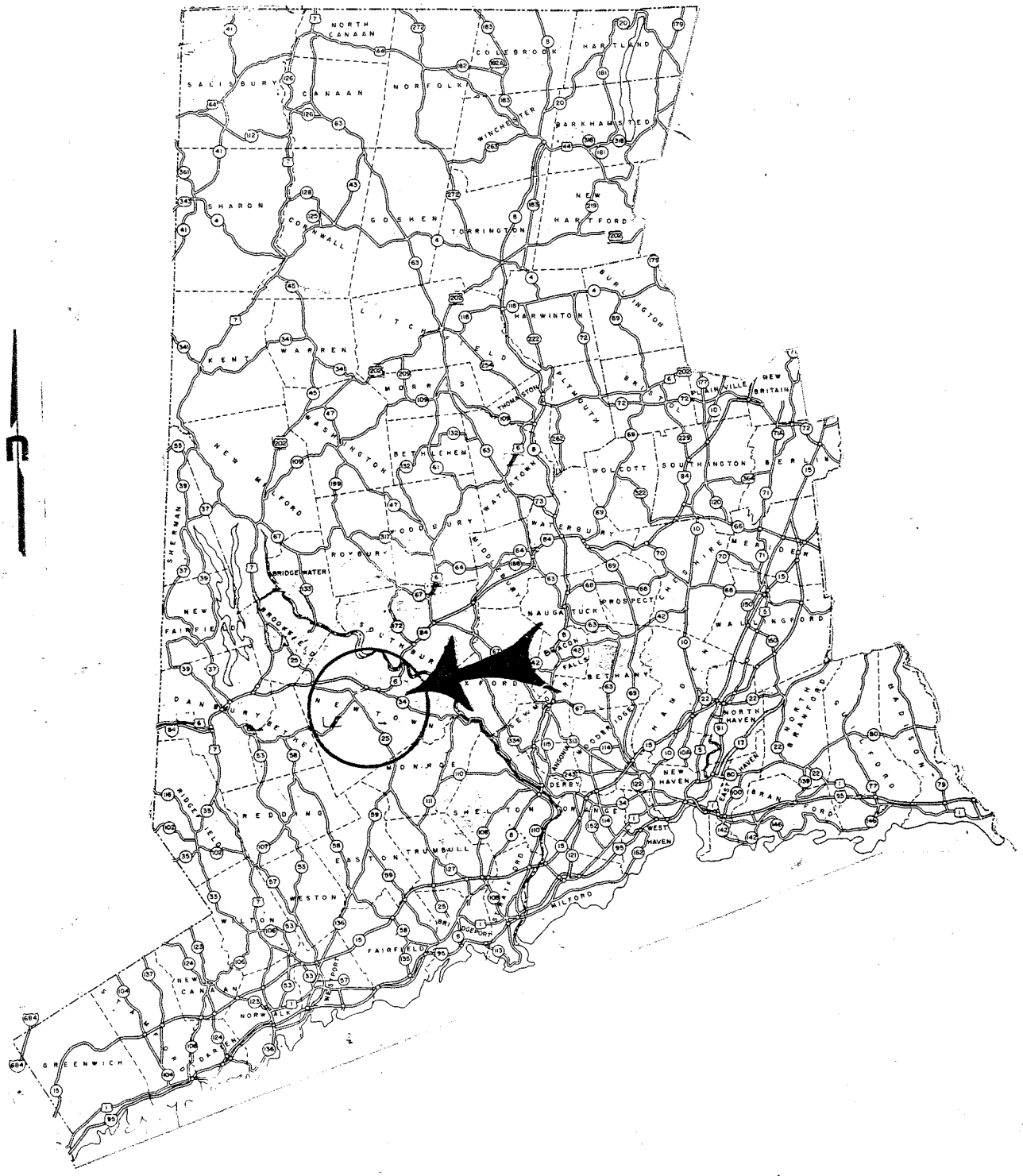


Scale 1" = 10 miles

10 0 5 10 miles

ENVIRONMENTAL REVIEW TEAM REPORT
ON
OLD FARM HILL SUBDIVISION
NEWTOWN, CT

I. INTRODUCTION

This report on the proposed "Old Farm Hill Subdivision" was prepared at the request of the Newtown Planning and Zoning Commission.

The subject site is ± 304 acres in size and is located in the northcentral section of Newtown between Old Green Road and Hanover Road. As shown in Figure 1, the site is characterized by moderate to steep slopes and is mostly wooded. A CL & P right-of-way traverses the northern half of the site; a gas company right-of-way crosses the northwestern corner of the property.

The proposed project calls for 103 single family units of 2+ acres in size. All lots would be served by individual on-site wells and septic systems. Access to the new lots would be created by constructing an interior road network off Old Green Road and Echo Valley Road. Several open space areas are proposed under the plan (see Figure 2).

As shown in Figure 3, the project is proposed to be completed in six separate phases. Phase I-B of the project (15 lots in the northeastern corner of the tract) has already been approved by the town and is under construction. Phase I-A (22 lots in the northwestern corner) has been submitted to the Inland Wetlands Commission for approval and is expected to be received by the Planning and Zoning Commission in the near future.

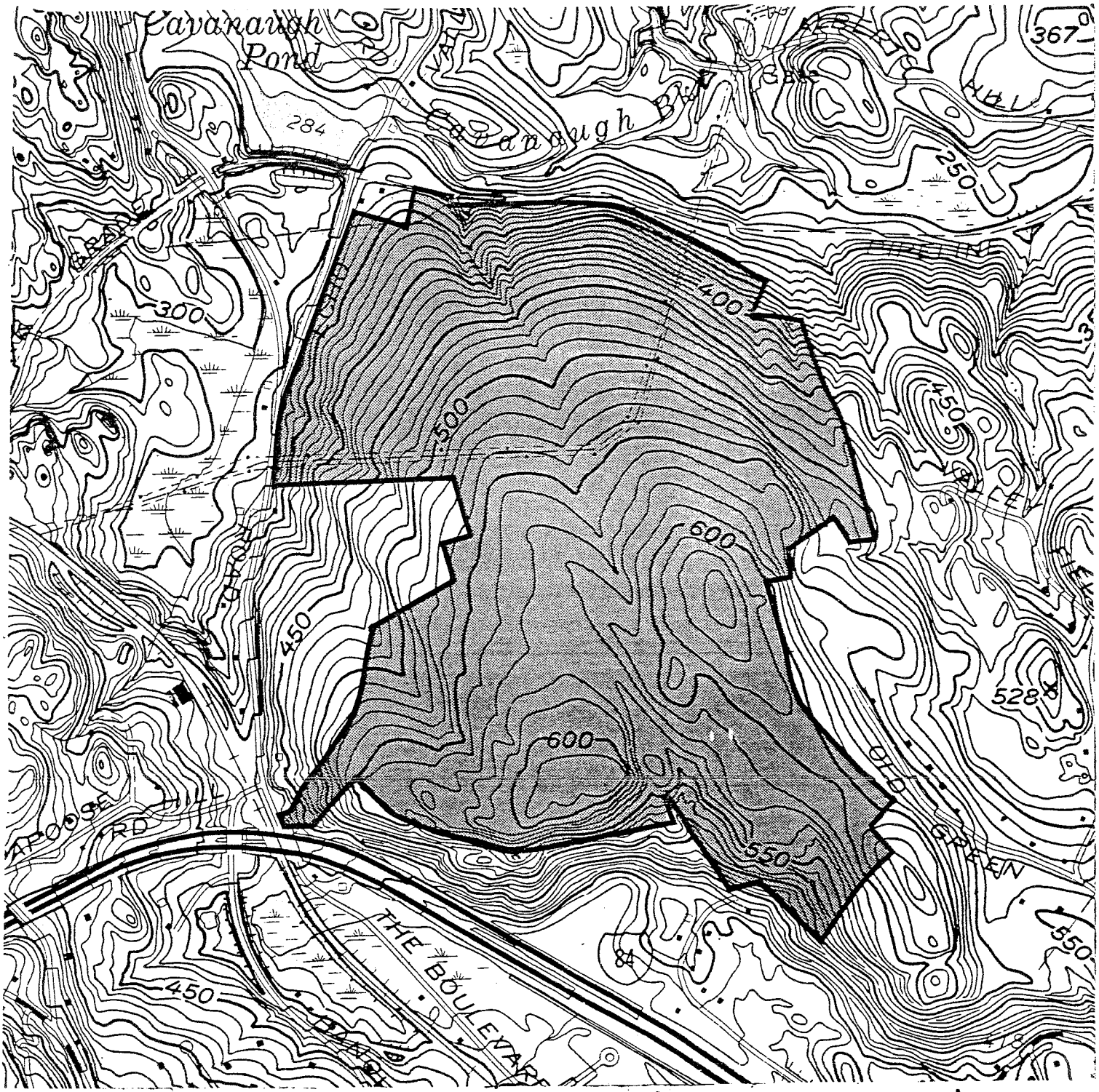
The Newtown Planning and Zoning Commission requested this ERT study to assist them in reviewing phase I-A and the subsequent phases of the proposed project. The ERT was asked to identify the natural resource base of the subject site and to discuss opportunities and limitations for the proposed project. Of particular concern to the Commission is: 1) suitability of the site for subsurface sewage disposal; 2) probability of obtaining satisfactory well yields to service the project; 3) impact of the project on stormwater run-off and erosion and sedimentation, and 4) impact of the project on local traffic.

The King's Mark Executive Committee considered the Town of Newtown's request for an ERT study, and approved the project for review by the Team.

The ERT met and field reviewed the site on May 16, 1984. Team members participating on this project included:

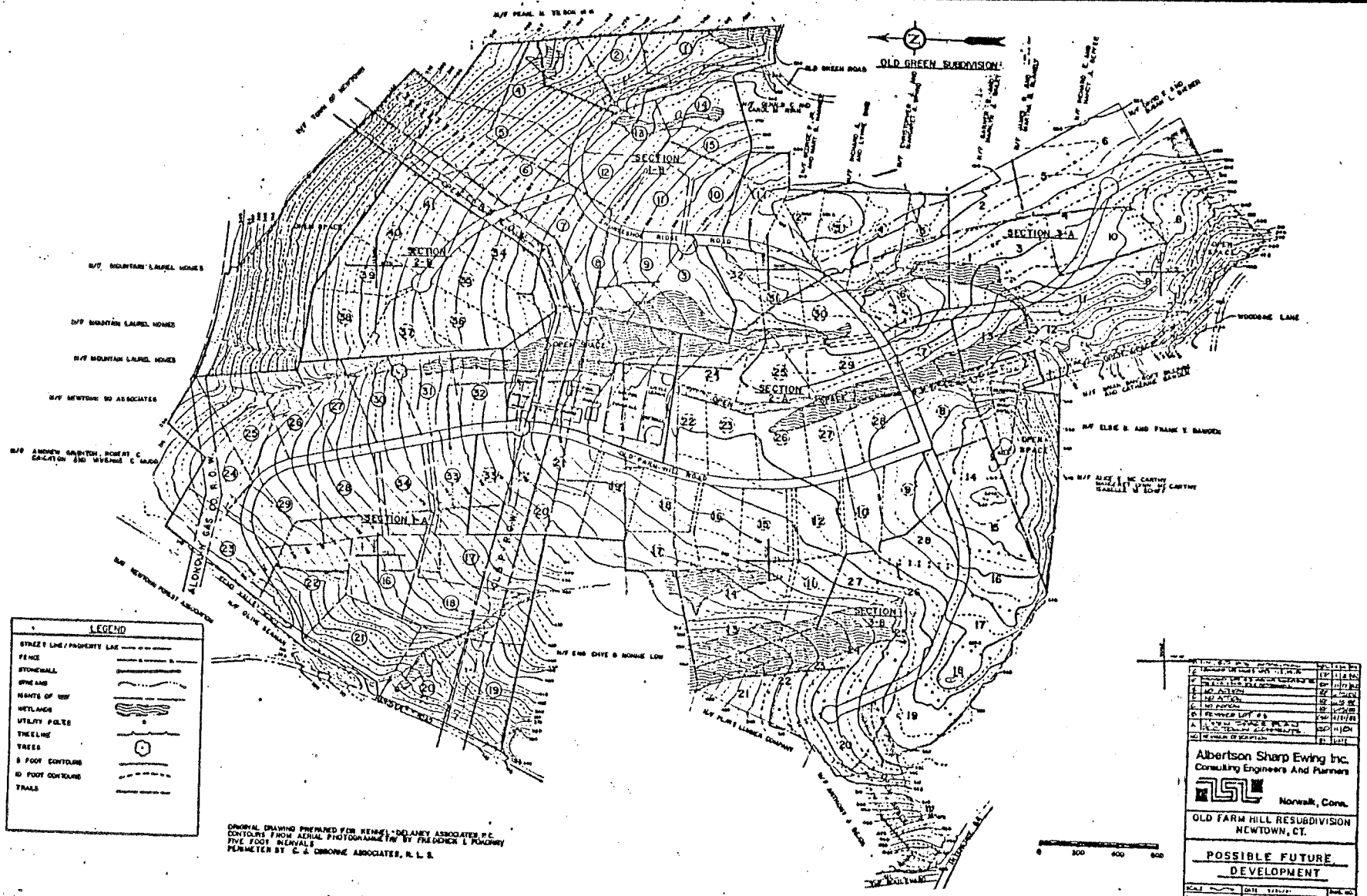
Marc Beroz	Soil Scientist	U.S.D.A. Soil Conservation Service
Larry Johnson	Planner	CT Office of Policy and Management
Richard Lynn	ERT Coordinator	King's Mark RC&D Area
Frank Schaub	Sanitary Engineer	CT Department of Health

FIGURE 1
TOPOGRAPHIC MAP



SCALE: 1" = 1000'

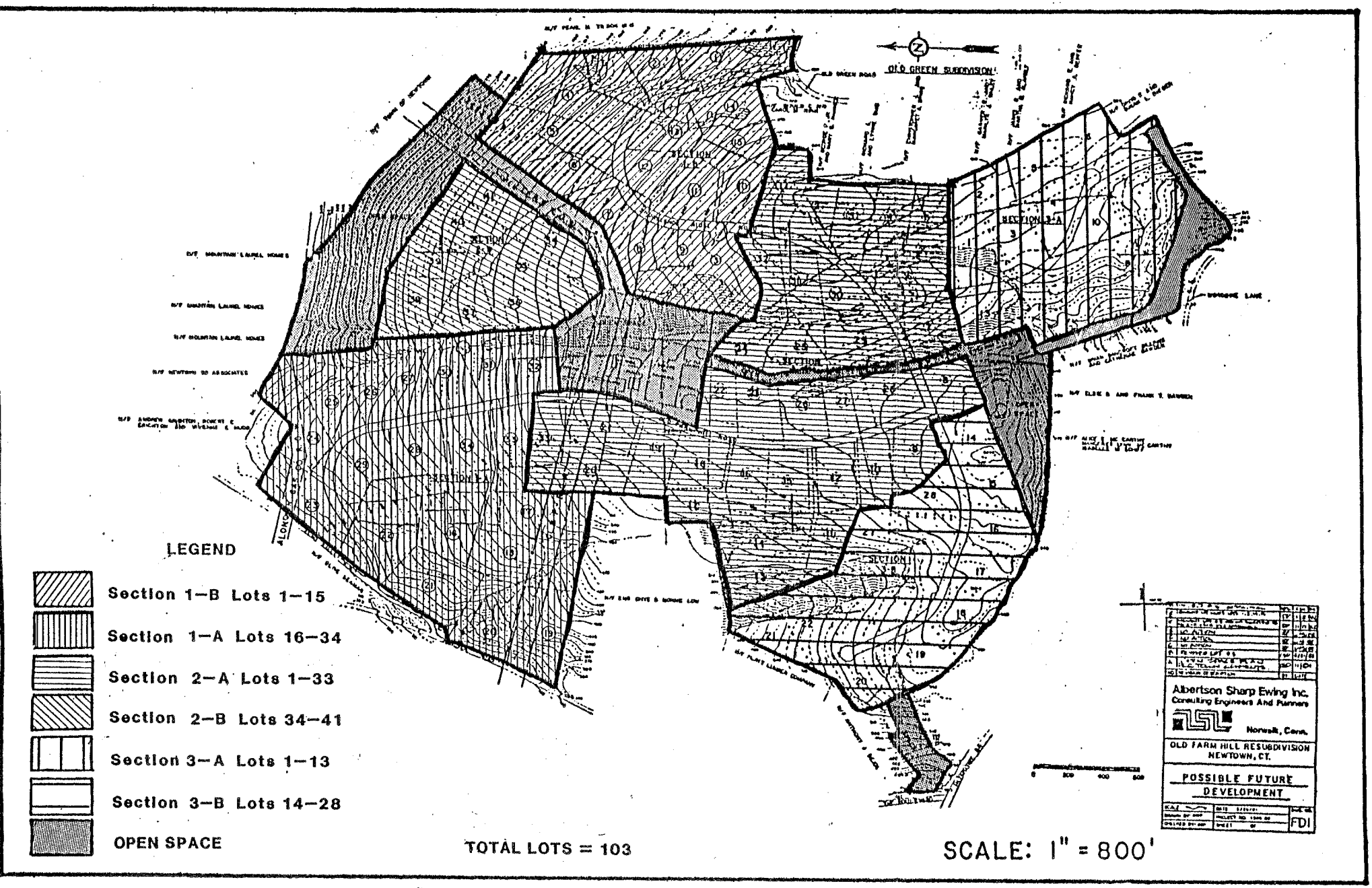
FIGURE 2
SITE PLAN



NOTE: this map is a reduced copy of the submitted site plan

SCALE: 1" = 800'

FIGURE 3
PROJECT PHASING



Don Smith.....Forester.....CT Department of Environmental Protection

William Warzecha.....Geohydrologist.....CT Department of Environmental Protection

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

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

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

* * * * * *

II. HIGHLIGHTS

1. *The geological limitations which may pose constraints with regard to the proposed subdivision include: (1) areas where slopes are moderate and steep; (2) areas where bedrock is at or near the surface of the ground; (3) areas of wetland soils; and (4) the presence of a compact till-based soil (hardpan) which predominates over the site and which has a tendency to be stony, seasonally wet and have slow percolation rates. These limitations will weigh heaviest on the installation of subsurface sewage disposal systems, foundation placement, and road/driveway construction. These limitations do not necessarily preclude development of the proposed project, but they do underscore the importance of careful planning, engineering, and implementation of the project. (p. 9)*

2. *It appears the only suitable aquifer available to service the project is the underlying bedrock. Bedrock is generally capable of supplying small but reliable yields of water for domestic use. A yield of 3 gallons per minute is considered adequate for the household needs of an average family. The quality of the groundwater in this area is expected to be good. (p. 10)*

3. *Development of the site under present plans can be expected to increase the amount of runoff from the site for a given rainfall amount. These increases will result mainly from the conversion of permeable soils to impermeable surfaces such as roofs, paved roads and driveways, and from the removal of vegetation. The effects of added runoff from developed areas may lead to increased overland and stream-channel erosion and may increase the potential for flooding in downstream areas. (p. 11)*

4. *Due to the increases in stormwater runoff volume which is expected to occur with the various phases of development of the parcel, it is recommended that a detailed stormwater management plan be prepared for this project. Special attention should focus on the effects of the development on downstream culverts as well as the proposed detention area which is to be located on the Newtown Forest Association property northwest of the site. The plan should include hydrological information on pre- and post development runoff volumes and peak flows from the property for a 10, 25, 50 and 100 year design storm, detailed design specifications for all stormwater control facilities, and erosion and sediment control measures. (p. 13)*

5. *The wetlands on this site act as a natural runoff retention basin and also serve to trap sediment and improve water quality. The proposed project generally avoids direct disturbance of these areas, which is an attribute of the plan. (p. 13)*

6. *The majority of the site is characterized as having soils with hardpan layers. On this particular site perched water tables occur in all the hardpan soils at depths of less than 24 inches. All the hardpan soils have severe limitations for septic tank absorption fields. These soils cannot be effectively used for absorption fields without special engineered designs and modification of the soils at the site. The perched water table will also cause wet basements unless footing drains are used and may cause frost heaving of roads without proper drainage controls. (p. 15)*

7. *Much of the subject property has severe limitations for residential development due to steep slopes, hardpan soils, and seasonal wetness. Construction of the project will undoubtedly require substantial site modification to accommodate roads and driveways at reasonable grades, housesites, and on-site septic systems. In light of this substantial site modification, it will be very important that a conscientious erosion and sediment control plan be prepared and implemented for each phase of the project. (p. 18)*

8. *From a sanitary engineering standpoint, every lot within Section 1-A would be classified as an area of special concern due to the seasonally high groundwater, steep slopes or identification of compact till soils at shallow depths. Preparation of leaching areas for the large majority of lots within Section 1-A will undoubtedly be costly. Each of the leaching systems will have to be protected by a ground water intercepting drain which should discharge to the nearby water courses or subdivision road drainage system. At least 2 foot of select fill will have to be placed over the leaching area in order to elevate trenches sufficiently above the compact soil layers. It is most likely that a large number of lots in future sections will also require preparation of detailed engineering plans in order to overcome lot limitations. The most marginal section, 2-A, will present the greatest problems in development due to soil types, limited gradient and the associated ground water/surface water problems. Despite the severe limitations imposed by this site, with careful planning and engineering, development of the Old Farm Hill property as proposed does appear feasible in the opinion of the Team's sanitary engineer. (p. 18. 19)*

9. *The subject site may be divided into 7 differing vegetative types including mixed hardwoods, old fields, plantation, softwoods, and wetlands. With development of the property in phases as proposed, consideration should be given to implementing a definite sequence of forest management which should include thinning of certain vegetative types. (p. 19)*

10. *Located throughout this area are several large healthy trees which would make ideal specimen trees. These trees have extremely high aesthetic and shade value. They should be worked into the landscape plan for this development where possible. The Natural Diversity Data Base of the Connecticut Department of Environmental Protection does not have any records of rare, endangered, or threatened species on this site. (p. 24)*

11. *The proposal is considered by the Team's planner to be consistent with local and State plans. (p. 24)*

12. *The Connecticut Department of Transporatation uses a standard of 10.1 trips per day per single family unit in estimating traffic impact of a development. The completed project would thus produce about 1,000 trips per day, which the developer's traffic study suggests might be distributed on a 2/1 basis between Boulevard/Hanover Rd. and Walnut Tree Hill Rd. The developer's traffic study also states that the proposed subdivision would not exceed the capacity of the Boulevard, Hanover Rd. or Walnut Tree Hill Rd. According to the proposed subdivision plan, the developer will correct the alignment and sight line problems at the junction of Echo Valley Rd. and Hanover Rd. Problems beyond the proposed subdivision, such as the narrow railroad overpasses on Hanover and Boulevard and the sight line problems at Old Green and Walnut Hill, will not be corrected, however, and will probably become more serious as additional subdivisions are proposed in this area. (p. 25)*

III. TOPOGRAPHY AND GEOLOGY

The "Old Farm Hill Subdivision" site is located in northcentral Newtown, north of I-84 between Old Green Road and Hanover Road. It consists of an irregularly shaped parcel of land, ± 304 acres in size. The site is a mixture of sloped woodlands, surface drainage channels and some bedrock exposures. Slopes on the site range from relatively flat areas in the southcentral part of the site to steep areas primarily at the southern and northern limits. With the exception of the southern limits of the site, most slopes face generally northwestward. High and low points on the site range from about 300 feet to ± 600 feet above mean sea level.

The site is situated on an upland till and rock drumlin. A "drumlin" may be defined as a streamline, oval-shaped glacial feature which has a bedrock core that is mantled primarily with till (hardpan). It was formed by the molding action of glacier ice, which overrode the till deposits as it moved southward. The long axis of a drumlin is oriented in the direction of ice movement. The Old Farm Hill property drumlin indicates a movement of ice to the southeast.

At least two perennial streams are visible on the site. They are located in the northern portions of the property and are tributary to Cavanaugh Brook. These streams are not mapped as perennial streams on the USGS Newtown quadrangle map.

The "Old Farm Hill Subdivision" site lies within the Newtown topographic quadrangle. A map of the bedrock geology of the Newtown quadrangle by Rolfe S. Stanley and Katherine G. Caldwell (1976) shows the rock type that underlies or crops out on the site. This map (QR-33) has been published by the Connecticut Geological and Natural History Survey. At the present time a surficial geologic map of the quadrangle has not been published.

Bedrock Geology

According to map QR-33 bedrock underlying or cropping out on the site is classified as Hartland II formation. It consists of a light-brown to gray, rusty to non-rusty weathering, medium grained schist composed of the minerals muscovite, biotite, quartz and plagioclase with porphyroblasts (large crystals) of garnet, staurolite and/or kyanite. Locally, it may also contain chlorite porphyroblast. This rock unit is interbedded throughout by layers of gneiss and granulites. The gneisses are composed of the minerals quartz, plagioclase and mica.

All three rocks types (i.e., schists, gneisses and granulites) are metamorphic; that is, rocks altered by high temperatures and pressures within the earth's crust. These stresses of deformation caused the alignment of platy, flaky and elongate minerals into thin sheets or bands. Where the alignment has resulted in a slabby rock (one that splits relatively easily along surfaces of mineral alignment), the rock is termed a "schist". Where the alignment has resulted in a banded but more massive rock, the rock is termed a "gneiss". The term "granulite" refers to a rock composed of even sized, interlocking granular minerals. As mentioned earlier, one rock type may grade into another. Bedrock is at or near the ground surface along the southern

limits of the site. These areas are delineated by the symbols HrE (Hollis-rock outcrop-Charlton complex), CrC (Charlton Hollis) and CnC (Charlton) in Figure 5.

Surficial Geology

The surficial geologic material covering the site is till. Till is a glacial sediment which consists of rock particles of varied shapes and sizes. These sediments were derived from the local bedrock (e.g., gneisses, schists, etc.) and were deposited by glacier ice without being re-worked by glacial meltwater. Commonly, till deposits at depths below 2-5 feet are silty, very compact, and only slightly permeable. In the upper few feet, the till is often sandier, very stony, less compact, with moderate permeability. Thickness of the till probably ranges from zero where bedrock is at ground surface (southern limits) to at least 8 feet or more throughout the remainder of the site. According to written correspondence on file at the Newtown Town Hall, in regard to the subject parcel, data from deep test holes excavated on the site indicates the "depth to bedrock exceeds 6 to 8 feet or more on most of the site". (Source - "Hydrogeologic Assessment, Old Farm Hill Resubdivison, Newtown, Connecticut" by Leggette, Brashears and Grahm, Inc., Consulting Ground-Water Geologists, 1983).

Overlying till in the central portions of the property are bands of seasonally wet areas. They lie principally along intermittent drainage channels and point in a northwest-southeast direction. The accompanying soils map (see Figure 5) identifies these areas by the symbol Rn (Ridgebury, Leicester, Whitman soils).

Geologic Development Concerns

The geological limitations which may pose constraints with regard to the proposed subdivision include: (1) areas where slopes are moderate and steep, primarily in the southern limits and northern half of the parcel (it should be noted that the steepest slopes on the site appear to be designated as open space); (2) areas where bedrock is at or near the surface of the ground; (3) areas of wetland soils; and (4) the presence of a compact till-based soil (hardpan) which predominates over the site and which has a tendency to be stony, seasonally wet and have slow percolation rates. These limitations will weigh heaviest on the installation of subsurface sewage disposal systems, foundation placement, and road/driveway construction.

In terms of subsurface sewage disposal, properly engineered and installed systems may be able to surmount the above noted limitations in many instances. This consideration is discussed in more detail in Section VII of this report.

In areas where bedrock is at or near ground surface it may be necessary to blast in order to construct access roads and/or place house foundations. Since the steepest slopes are associated with shallow to bedrock areas, it is recommended that a detailed erosion and sediment control plan be formulated and followed very closely with implementation of the project.

Development in areas designated as Rn (Ridgebury, Leicester, Whitman soils) on the soil map should be avoided if possible. Based on the site plan submitted to Team members on the review day, it appears the wetlands will be crossed in only one area of the subdivision. This wetland crossing is located

in section 3-A and is approximately 25' wide. Additional crossings of wetland soils by driveways may also be requested, depending on project designs. Although undesirable, wetland road crossings are feasible, provided they are properly engineered.

When crossing wetland soils with roads or driveways, provisions should be made for removing unstable material beneath the road bed, backfilling with a permeable road base fill material, and installing culverts as necessary. The roads should be at least 1.5 feet and preferably 2 feet above the surface elevation of wetlands. This will allow for better drainage of the roads. It will 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. It is particularly important that culverts be properly sized and located so as not to alter the water levels in the wetland.

Wetlands may limit the usefulness of some lots and the open space area in the central parts of the property.

Where feasible, it is recommended that building footing drains be installed around homes. This should hopefully minimize the chances of wet basements.

IV. WATER SUPPLY

Since there is no public water supply line available to the site, homes in the proposed subdivision would be supplied with water by on-site wells. It appears the only suitable aquifer available is the underlying bedrock. Yields from bedrock wells depend upon the number and size of water bearing fractures which the wells intersect. Density and size of fractures in different bedrock zones vary widely, but in general, both are greater in granular rock than in schist. As mentioned earlier, the Hartland Formation which is a schist, is interbedded throughout with gneisses and granulites. As a result, the ultimate yields may depend upon the particular zone the well taps. In either case, however, there would be at least an 80-percent chance that a well on any lot would yield at least 3 gallons per minute or more; 50 percent could be expected to yield 7 gallons per minute or more, and 10 percent could be expected to yield 12 gallons per minute or more (Source: Connecticut Resources Bulletin #21 (Upper Housatonic River Basin)). A yield of 3 gallons per minute or more is considered adequate for the household needs of an average family.

A survey of well completion reports for recently drilled bedrock wells in the vicinity of the subject parcel (i.e., Hanover Road, Walnut Tree Hill Road) indicated yields ranging between 1 and 3 gallons per minute at varying depths of 300 feet to 750 feet. As a well penetrates depths in bedrock, usually greater than 140 feet, the density and size of fractures decreases markedly. As a result, if yields of at least 1 gallon per minute are not achieved within the first 150-200 feet of bedrock on any lot, it would probably be more practical to drill in a new location rather than to continue drilling in the original hole.

The water quality of the groundwater may be expected to be good. However, there is a possibility of undesirably high mineral (particularly iron or manganese) content. Should water prove to be high in mineral content,

such as iron and manganese, several filtration methods are available to overcome the problem.

V. HYDROLOGY

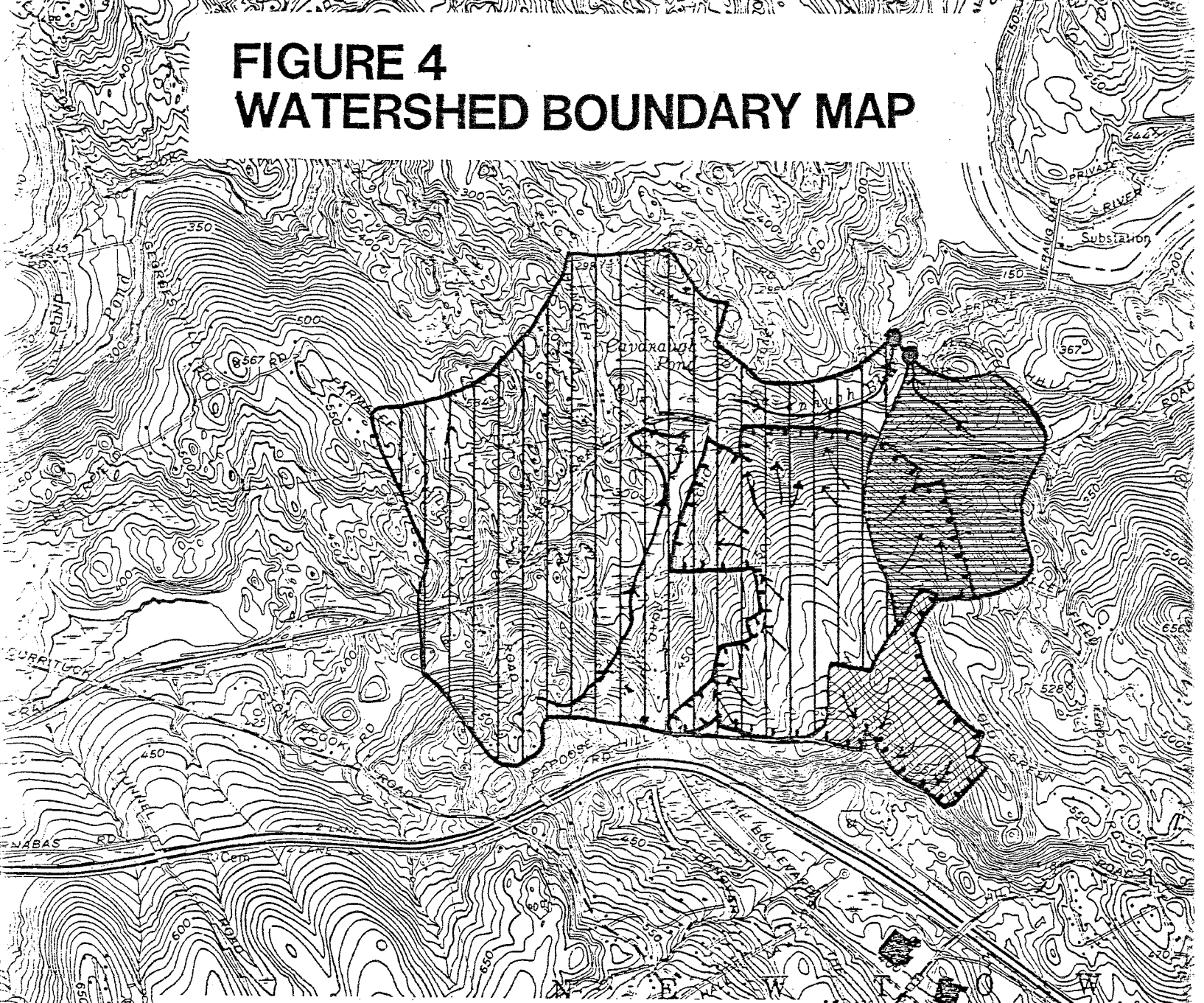
As shown in Figure 4, the site can be divided into three drainage areas. Surface runoff from the western and central portions, which consists of approximately 211 acres or nearly 70% of the site, lies within the watershed of Cavanaugh Brook. Once Cavanaugh Brook outlets from Cavanaugh Pond, which is north of the site, the Brook flows eastward for about 3,000 feet, ultimately discharging into the Housatonic River. Drainage in the eastern limits of the site is by an unnamed tributary of the Housatonic River north of the property. This tributary outlets into the Housatonic River at the same point of outflow as Cavanaugh Brook. The remaining ± 63 acres in the southern part of the site lies within the watershed of Tom Brook. Tom Brook flows in a southeast direction parallel to I-84 and ultimately discharges into the Pootatuck River. Surface waters, and for the most part, groundwaters on the site flow generally downslope toward local discharge areas such as intermittent drainage channels. Water is then routed via these channels. As a result, land in these areas hold low potential for development and/or on-site sewage disposal systems.

Development of the site under present plans can be expected to increase the amount of runoff from the site for a given rainfall amount. These increases will result mainly from the conversion of permeable soils to impermeable surfaces such as roofs, paved roads and driveways, and from the removal of vegetation. The effects of added runoff from developed areas may lead to increased overland and stream-channel erosion and may increase the potential for flooding in downstream areas.

The developer's engineer has addressed storm drainage in a preliminary plan that includes hydrologic computations. A copy of this preliminary plan as well as the computations were made available to Team members during the field review. These computations are based on the Soil Conservation Service's method, which is detailed in that agency's Technical Release No. 55. This method allows one to estimate the amount of increased runoff. It involves the determination of "runoff curve numbers" for a given watershed. These numbers relate runoff to rainfall in the watershed on the basis of soil types and current and proposed land usage. A higher curve number indicates that a given amount of runoff will be greater. Besides the SCS procedure, there are several other methods available for estimating the amount of increased runoff.

The preliminary storm drainage plan for the project indicates surface runoff created will be artificially collected and outletted. For the purposes of analyzing the runoff change likely to occur under present plans, the project engineer has broken the parcel down into smaller drainage areas. The drainage area analyzed for this report which includes Section I-A and portions of II-B consists of ± 40 acres in size. The point of outflow for the drainage area is at a culvert passing under Echo Valley Road. Based on the engineer's computations, it is estimated that development in this area would increase the curve number by 3 (73 to 76). Under these conditions, runoff depth for a 25 year storm event would increase from 3.25 inches to 3.55 inches; an increase of about 9 percent. The estimate for this watershed reflects an average increase for the parcel. Site conditions, such as soil type and slope appear to be similar throughout the site. However, actual increases will

FIGURE 4
WATERSHED BOUNDARY MAP



LEGEND

- Approximate property line
- Cavanaugh Brook watershed
- Watershed which drains the eastern limits of the site
- Portion of property which drains to Tom Brook
- Watercourses showing direction of flow
- Direction of surface runoff
- Design point

probably be greater in areas of more concentrated development and less in areas of lesser disturbance. Due to the increases in stormwater runoff volume which is expected to occur with the various phases of development of the parcel, it is recommended that a detailed stormwater management plan be prepared for this project for Town review. Special attention should focus on the effects of the development on downstream culverts as well as the proposed detention area which is to be located on the Newtown Forest Association property northwest of the site. The Town should consider requesting that either the town engineer or a consulting professional engineer review the final stormwater management plan as well as the drainage computations.

Prior to subdivision approval, consideration should be given to requiring the applicant to submit hydrological information on pre- and post development runoff volumes and peak flows from the property. Estimates should be provided for a 10, 25, 50 and 100 year design storm. Also, detailed design specifications for all stormwater control facilities should be submitted.

As mentioned earlier, there are moderate to steep slopes in various parts of the site. In view of these slopes, runoff from storm drainage in these areas could have potential for erosion. For this reason, it is recommended the stormwater management plan incorporate erosion and sediment control measures. Some measures which should be incorporated in the plan include: (1) disturbed areas should be kept small, (2) lawns should be established as soon as possible, (3) stormwater runoff velocities should be kept low, (4) disturbed areas should be kept from stormwater runoff, and (5) sediments should be managed to be retained within the project area.

As shown on the accompanying soils map (see Figure 5), there are areas of wetland soils (Rn). These wetland soils lie principally along drainage channels and/or in perennial watercourses. These wetlands, especially those flatter, low-lying areas may act as a natural runoff retention basin, thereby reducing downstream flooding during storms. They also serve many other valuable hydrological functions such as trapping sediment from upstream areas and providing pollution control through biochemical processes. For these reasons, these areas should be left undisturbed where possible.

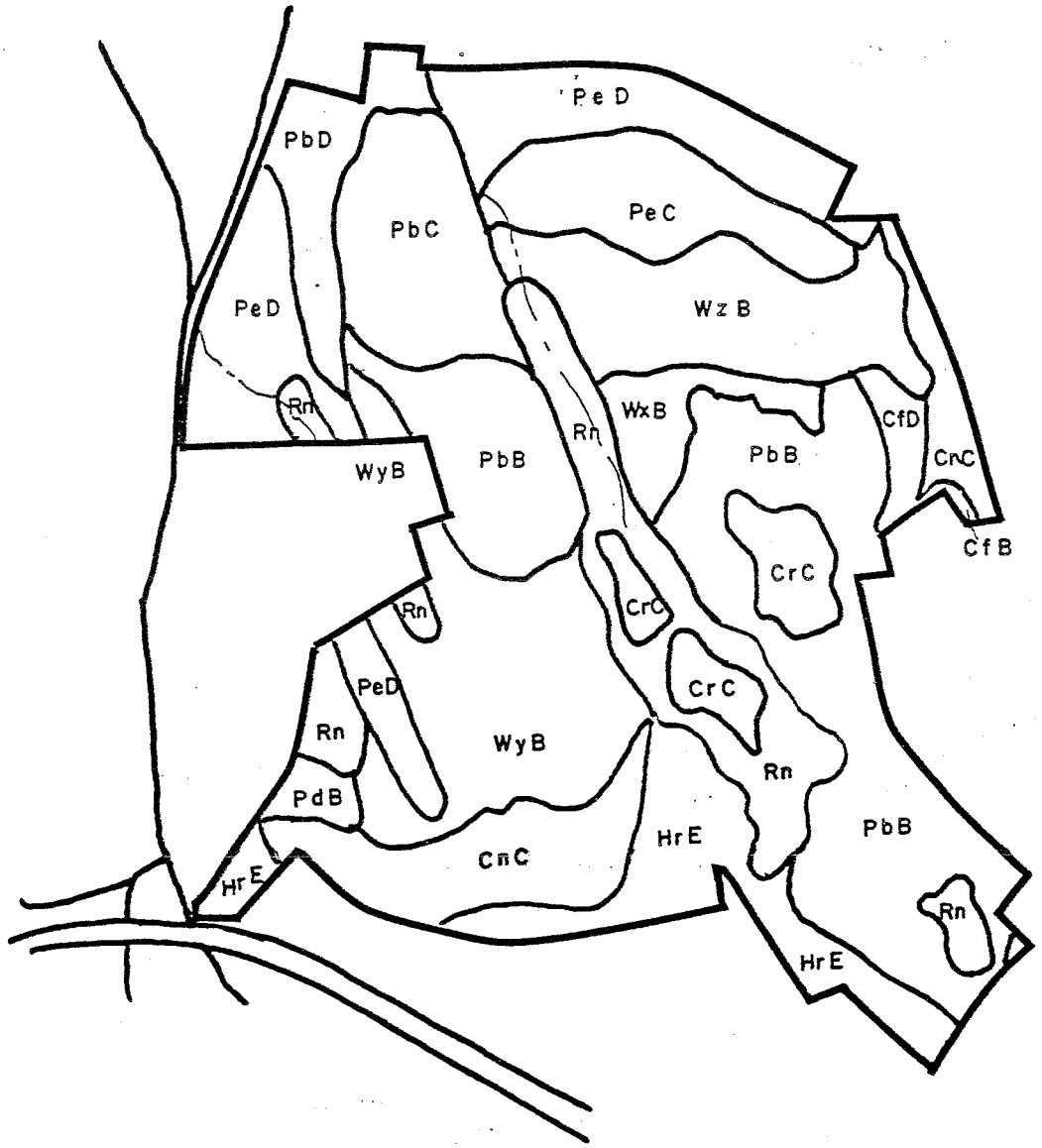
VI. SOILS

The soil survey map presented in Figure 5 was adapted from the Soil Survey of Fairfield County, USDA Soil Conservation Service and is substantially correct. The symbols on the map identify map units. Each map unit has a unique composition of soils. Areas with the same symbol have the same composition. This soil survey map should be supplemented by the Soil Type Map developed by Albertson, Sharp, Ewing, Inc., dated December 29, 1981. The latter map more accurately delineates the inland wetland boundaries. The narrative which follows is a revision of material contained in the Soil Survey of Fairfield County, Connecticut.

A. Hardpan Soils

The majority of the site is characterized as having soils with hardpan (dense and consolidated) layers. The top of the hardpan occurs between the depths of 20 to 28 inches. Hardpans are slowly permeable. Ground water does not readily flow through them. Instead, water flows over the top of the hardpans during the wetter periods of the year. This ground water is called a perched water table.

FIGURE 5
SOIL MAP



·see text for soil descriptions

SCALE: 1" = 1000'

On this particular site perched water tables occur in all the hardpan soils at depths of less than 24 inches. All the hardpan soils have severe limitations for septic tank absorption fields. These soils cannot be used for absorption fields without special engineered designs and modification of the soils at the site. There are several reasons for this. Septic effluent must pass through unsaturated soil in order to be properly renovated. In cases where the perched water table occurs at shallow depths, proper renovation of the effluent does not occur. In addition, septic effluent will flow along the top of the hardpan layers since the hardpan is so slowly permeable. This may result in effluent surfacing downslope.

The perched water table will also cause wet basements unless footing drains are used.

Map Units PbB, PbC and PdB

These map units are dominated by Paxton soils that are very deep and well drained. Slopes range from 3 to 15 percent. Typically these soils are fine sandy loam to a depth of 60 inches or more. A slowly permeable hardpan layer has its upper boundary at about 24 inches. Depth to the seasonal, perched water table is between 16 and 24 inches. This perched water table is present primarily during the months of February through April. Less than 5 percent stones and boulders occur on the soil surface.

These soils are poorly suited for septic tank absorption fields, as described above. Frost heaving of road surfaces may also be a problem.

The site plan shows an area set aside for open space which may eventually be developed for active recreational use. This open space is located in the center of the parcel. This area has poor potential for playgrounds and other heavy foot traffic. Without drainage controls, the slow permeability of the hardpans, along with relatively high water tables will keep the playing fields soggy in the spring and fall as well as after heavy summer rains.

Map Unit PbD

This map unit is composed of Paxton soils on 15 to 25 percent slopes. The description and suitability of these soils are the same as noted above except for slope.

Homesite development within this map unit will be complicated by the steepness of slope. This will be reflected in the costs of designing and installing septic systems, house foundations and roads. Downslope "breakout" of septic effluent is more likely to occur on these steeper slopes.

Map Unit PeC

This map unit has Paxton soils on 3 to 15 percent slopes. These Paxton soils are the same as those described above in map units PbB, PbC and PdB except 5 to 35 percent of the soil surface is covered by stones and boulders. Some of these rocks may be buried beneath the soil surface. These rocks will increase the costs of installing septic systems, and constructing basement foundations and roads.

Map Unit PeD

This map unit has Paxton soils on 15 to 35 percent slopes. Stones and boulders cover 5 to 35 percent of the soil surface. Some rocks may be buried beneath the soil surface. In addition to the development problems described above in map units PbB, PbC and PdB, the steep slopes and rock content of these soils will make homesite development extremely difficult. Downslope surfacing of septic effluent is more likely to occur on these steep slopes.

Map Unit WxB and WyB

These map units are dominated by Woodbridge soils. These soils are very deep and moderately well drained. Slopes are 3 to 8 percent. Typically these soils are fine sandy loam throughout. A slowly permeable hardpan layer has its upper boundary at about 24 inches. Depth to the seasonal, perched water table is between 16 and 24 inches. This perched water table is present primarily during the months of November through May. Less than 5 percent of the soil surface is covered by stones and boulders.

The presence of a hardpan and perched water table make these soils poorly suited for septic tank absorption fields. Frost heaving of road surfaces is also a problem.

Map Unit WzB

This map unit is dominated by Woodbridge soils on 3 to 8 percent slopes. These soils are similar to the Woodbridge soils in map units WxB and WyB except that 5 to 35 percent of the soil surface is covered by stones and boulders. In addition to the problems already cited, these rocks will increase the costs of homesite development.

Map Unit Rn

On this site the Rn map unit is dominated by the poorly drained Ridgebury soils and very poorly drained Whitman soils on 0 to 3 percent slopes. These soils are inland wetland soil types. Typically, both soils have fine sandy loam or gravelly fine sandy loam textures to a depth of 60 inches or more. They have hardpans with an upper boundary at about 24 inches. Both soils are poorly suited for homesite development due to their high water tables.

B. Soils Without Hardpan

Map Unit CfB

This map unit is dominated by Charlton soils on 3 to 8 percent slopes. These soils are very deep and well drained. Typically they have fine sandy loam textures to a depth of 60 inches or more.

These soils are well suited for homesite development. Septic systems will be easy to design and install. Building foundations and roads will be easy to construct and maintain.

Map Unit CfD

This map unit has Charlton soils on 15 to 25 percent slopes. These soils are poorly suited to homesite development. Their steep slopes make constructing septic systems, building foundations and roads costly.

Map Unit CnC

Charlton soils dominate here on 3 to 15 percent slopes. These soils are similar to the Charlton soils described in map unit CfB except they have 5 to 35 percent stones and boulders covering their surface. Some rocks may also be buried beneath the soil surface.

These soils have fair potential for community development. The presence of rock in and on the surface, along with slopes above 8 percent will pose some problems in site development.

Map Unit CrC

This map unit is composed of 2 very different kinds of soils on 3 to 15 percent slopes. These soils are so intermingled on the ground that they cannot be separated on the map. One soil is named Charlton. This soil is very deep and well drained. Typically it has fine sandy loam textures to a depth of 60 inches or more.

The other soil is Hollis. This soil is shallow and somewhat excessively drained. Typically it has fine sandy loam textures and is 10 to 20 inches deep over hard bedrock. The Hollis soil has bedrock outcroppings associated with it and together they comprise about 25 percent of the map unit. Both soils have 1 to 5 percent stones and boulders covering their surface.

The Charlton soil is well suited for the proposed use. Some increase in costs should be expected on slopes greater than 8 percent.

The Hollis part of this map unit is poorly suited for site development due to the depth to bedrock.

Map Unit HrE

This map unit is composed of 2 soils and rock outcrop on 15 to 45 percent slopes. These three components are so intermingled on the ground that they cannot be separated on the map. One soil is named Hollis. It is shallow and excessively well drained. Typically the Hollis soils have fine sandy loam textures and are 10 to 20 inches deep over hard bedrock. This soil comprises about 40 percent of the map unit.

The Hollis soils occur in close association with the rock outcrops. These outcrops consist of exposed bedrock. The rock outcrop component of this map unit covers about 25 percent of the area.

The Charlton soils are very deep and well drained. They have fine sandy loam textures to a depth of 60 inches or more. These soils cover about 20 percent of the area.

The remaining 15 percent of the map unit consists of a number of soils of lesser extent with various properties and suitabilities.

This map unit is poorly suited for homesite development due to slope. In addition, the Hollis soils are poorly suited for development due to shallow to bedrock conditions.

C. Erosion and Sediment Control

As noted in the foregoing discussion, much of the subject property has severe limitations for residential development due to steep slopes, hardpan soils, and seasonal wetness. Construction of the project will undoubtedly require substantial site modification to accommodate roads and driveways at reasonable grades, housesites, and on-site septic systems. In light of this substantial site modification, it will be very important that a conscientious erosion and sediment control plan be prepared and implemented for each phase of the project. The USDA Soil Conservation Service office in Bethel (743-5453) is available to assist in the preparation and review of erosion and sediment control plans.

VII. SEPTIC SYSTEMS

Proposed development plans indicate the 304 acre site will be divided into approximately 103 two-acre lots with the remaining area dedicated to open space, road development and preservation of wetlands. The 15 lot section 1-B has already been approved by the Planning and Zoning Commission. Section 1-A which consists of 19 lots is presently being reviewed by local agencies. The remaining sections 2-A, 2-B, 3-A, and 3-B will undoubtedly be proposed for development at some later time.

As part of the State of Connecticut Department of Health Service's normal assistance to local health departments, Sections 1-A and 1-B have already been reviewed by health department staff. All lots in Section 1-B (the approved section) were generally suitable for development of on-site sewage disposal systems. Section 1-A located off Echo Valley Road was somewhat less suitable due to the seasonally high ground water conditions and steep slopes in the southwestern section. Extensive soil testing has been performed in all lots within this section and proposed leaching areas have been accurately identified. Every lot within Section 1-A would be classified as an area of special concern due to the seasonally high groundwater, steep slopes or identification of compact till soils at shallow depths. Proposed lot 19 was the only lot to require use of an effluent pump lift station. Site development necessary to construct a driveway and house location on the steep slopes prohibit construction of a septic system down gradient from the proposed dwelling. A suitable leaching area has been identified in the rear of the lot and thus pumping 75 feet above the dwelling would be acceptable. Accurate location of water courses on both lots 19 and 20 will be required in order to assure the town's minimum setbacks to water courses can be maintained.

Preparation of leaching areas for the large majority of lots within Section 1-A will undoubtedly be costly. Each of the leaching systems will have to be protected by a ground water intercepting drain which should discharge to the nearby water courses or subdivision road drainage system. At

least 2 foot of select fill will have to be placed over the leaching area in order to elevate trenches sufficiently above the compact soil layers. Shallow leaching trench systems would be best suited for the soil types and must be spread wide parallel to existing contours in order to minimize the loading effect on natural soils. Sufficient area exists within the proposed lots to construct leaching systems in accordance with these design requirements.

Although no specific soil test data was available on the remaining subdivision sections, it appeared obvious that on site disposal would be most critical in section 2-A. The limited slope of the Charlton, Paxton and Woodbridge soils will mean greater difficulty in controlling seasonal ground water problems. The hydraulic restrictions due to soil type, limited slope and infiltration of seasonal rainfall may be a severe problem on lots 9, 10, 12, 22 through 30 of Section 2-A. When individual subdivision lot soil testing is done in this area, provisions should be made to permit accurate determination of seasonal high ground waters through the forthcoming spring months. It may be necessary for the developer to install ground water control drains on certain lots to demonstrate how effective control of seasonal high ground water can be achieved. Any lot on which the ground water remains less than 18 inches from the surface of the ground for a month or more during the wet time of the year would be classified unsuitable in accordance with the Public Health Code.

Specific soil test data from all proposed subsections of this subdivision will provide valuable data in determining the suitability of each individual lot. The minimum 2 acre lot size usually provides sufficient area for construction of subsurface sewage disposal systems providing the top and subsoils are fairly permeable and sufficient slope exists to assure ground water control. It is most likely that a large number of lots in future sections will require preparation of detailed engineering plans in order to overcome lot limitations.

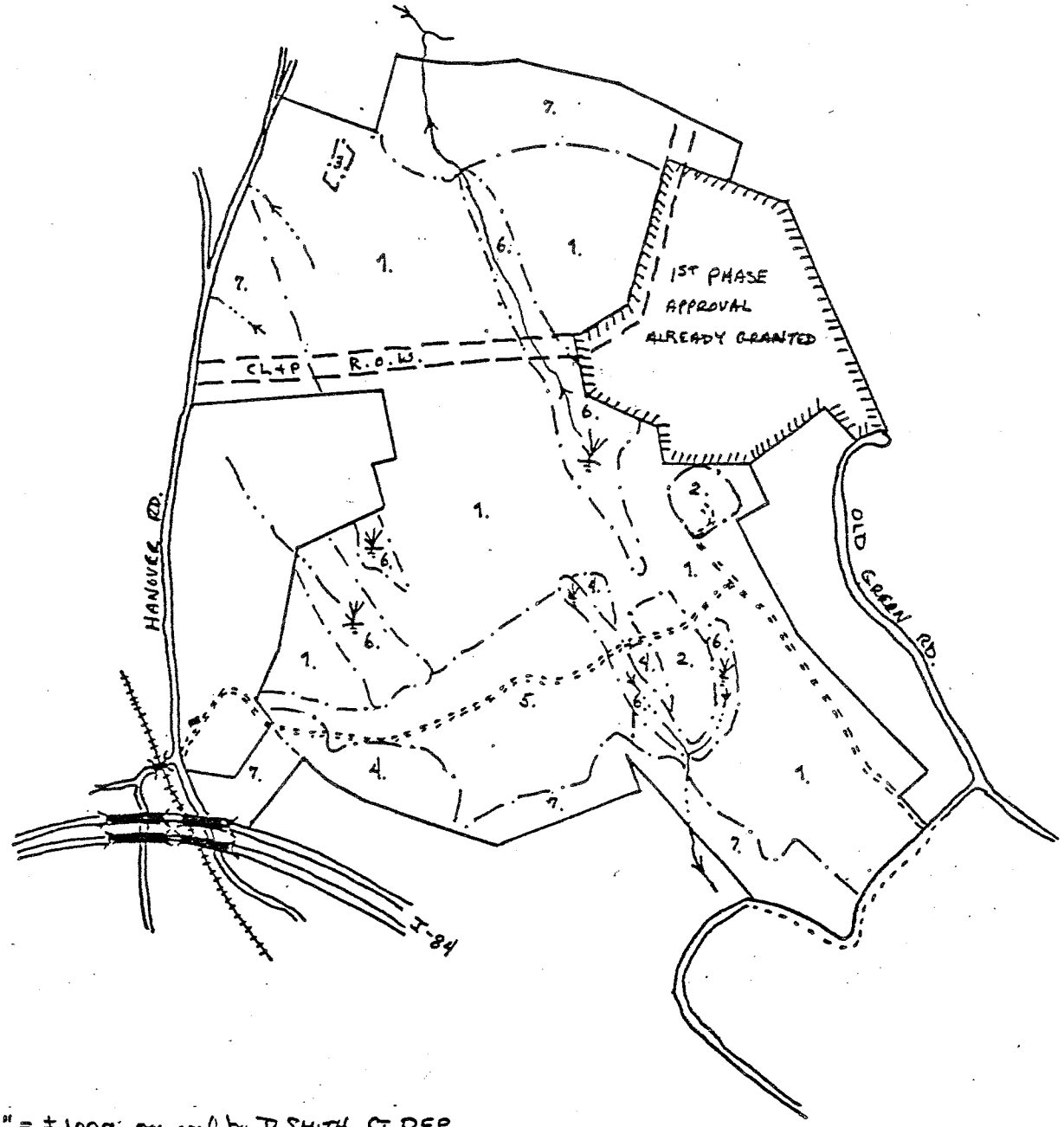
In summary, development of the Old Farm Hill property as proposed by the design engineer does appear feasible. The most marginal section, 2-A, will present the greatest problems in development due to soil types, limited gradient and the associated ground water/surface water problems. The remaining sections 2-B, 3-B, and 3-A were considerably drier and provided acceptable slope normally required for effective ground water control. It is probable to assume State Health Department staff will provide technical assistance to the Newtown Health Department in reviewing specific soil test data and subdivision proposals as individual sections are submitted to town agencies for review and approval.

VIII. VEGETATION

A. Vegetative Type Descriptions

The subject property totals 304 acres in size. According to aerial photo interpretation, the first phase of development, (now under way), affects some 42 acres. The remaining 262 acres may be divided into 7 differing vegetative types - each of which is described below. The location of the various types is shown in Figure 6.

FIGURE 6
VEGETATION TYPE MAP



scale 1" = ±1000' prepared by D. SMITH, CT. D.E.P.
MAY, 1984

LEGEND:
- ROAD
- TRAIL
- UTILITY R.O.W.
- STAND BOUNDARY
- RAILROAD
- BRIDGE
- STREAM
- VERNAL STREAM
- WETLAND

ACREAGE BREAKDOWN

STAND #	ACRES	DESCRIPTION
1.	137	Mixed Hardwood/Old Field
2.	7	Old Field
3.	1	Plantation
4.	13	Softwood
5.	28	Oak/Mixed Hardwood
6.	26	Wetland
7.	50	Inaccessible/Inoperable
TOTAL	262	
1ST PHASE	42	
PROJECT TOTAL	304	

Stand #1. Mixed Hardwoods/Old Fields, 137 acres - This fully stocked stand is composed of fair quality, pole sized aspen, cherry, grey birch, black birch, red oak, hickory, ash, red maple, and red cedar. These trees are growing at a good rate on a good quality growing site and are approximately 40 years old.

The understory species encountered include saplings of the same species, spicebush (in the wetter areas), multiflora rose, and some barberry.

The ground cover here includes scattered grasses, wild geranium, wild strawberry, some ground pine, Christmas fern, violets, and common cinquefoil.

This area encompasses several areas of distinct age differences. Basically this stand is checkerboarded with old fields which were abandoned at different times. As age differs so also will size. Throughout the stand are scattered large, open-grown wolf trees of red oak, hickory, red maple, and ash in varying degrees of health and vigor.

Stand #2. Old Field, 7 acres - This under stocked old field is composed of medium quality, sapling to pole sized red cedar, red maple, hickory, red oak, grey birch, and cherry. These trees are growing at a good rate on a medium quality growing site and are approximately 20 years old.

The understory species encountered include smooth and staghorn sumac, multiflora rose, and hardwood reproduction.

The ground cover here includes grasses, cinquefoil, mullein, virginia creeper and poison ivy.

Stand #3. Plantation, 1 acre - This over stocked plantation is composed of medium quality, pole to small sawlog sized Norway spruce. These trees are growing at a fair rate on a good quality growing site and are approximately 40 years old.

The understory and ground cover here is nonexistent due to heavy crown cover.

Stand #4. Softwood, 13 acres - This well stocked stand is composed of medium quality, pole to small sawlog sized hemlock with white pine, oak, hickory, sugar maple and red maple interspersed. These trees are growing at a medium rate on a medium quality growing site and are approximately 40-60 years old.

The understory species encountered include hemlock saplings, viburnum, and highbush blueberry.

The ground cover here includes poison ivy, Christmas fern, violet and wild geranium.

As in stand #1, large wolf trees are scattered throughout.

Stand #5. Oak/Mixed Hardwood, 28 acres - This well stocked stand is composed of good quality, small sawlog sized red oak, black oak, black birch, hickory, and red maple with occasional hemlock and white pine. These trees are growing at a medium rate on a medium quality growing site and are approximately 70 years old.

The understory species encountered include red maple, black birch, and scattered red oak saplings, dogwood, maple-leaved viburnum, and spicebush in the wetter areas.

The ground cover here includes scattered grasses, poison ivy, virginia creeper, and violet.

This area, as well as stand #4, was subjected to a heavy sawlog harvest in the summer of 1968 when it was a separate-owned parcel. Few wolf trees remain, but the main stand should be far more windfirm than in other stands.

Stand #6. Wetland, 26 acres - This well stocked stand is composed of fair quality, pole to small sawlog sized red maple with ash, yellow poplar, and scattered yellow birch on the drier margins. These trees are growing at a medium rate on a fair quality growing site and are approximately 40-60 years old.

The understory is limited to a dense cover of spicebush.

The ground cover here includes skunk cabbage, hummocks of grasses and sedge, jewelweed, and ferns but may be nonexistent under a dense spicebush cover.

Soil conditions here will preclude forest management activities.

Stand #7. Inaccessible/Inoperable Areas, 50 acres - This well stocked stand is composed of medium quality, small sawlog sized red maple, sugar maple, red oak, black oak, white oak, hickory, beech, and yellow birch. These trees are growing at a medium rate on a medium quality growing site and are approximately 70 years old.

The understory species encountered include red maple, sugar maple, beech, spicebush, and ironweed.

The ground cover here includes virginia creeper, trillium, Christmas fern, sensitive fern, poison ivy, lily of the valley, jack-in-the-pulpit, skunk cabbage, false solomon's seal, and violet.

This stand includes those areas deemed to be either inaccessible to, or unsuitable for the operation of wheeled vehicles due to steep slopes or excessive rockiness, or both. Basically these areas are the areas considered unfarmable by previous owners for the same reasons. Because of this, the trees are considerably more mature than those found in stand #1.

B. Forest Management

With development of the property in phases as proposed, consideration should be given to implementing a definite sequence of forest management. In this regard, it should be noted that a wooded site typically has considerable

economic value over a cleared site in a residential market. Recent studies have shown that a healthy, well managed wooded site will demand a price up to 27% higher than will a cleared site. In light of this inherent economic value for a healthy wooded site, consideration should be given to the following:

1) As soon as is practicable, a professional forester should be employed to mark and manage a thinning of types 1 and 5. Aesthetics should be the major concern, and the thinning should therefore be designed to remove the poorest quality stems. This would include: severely damaged trees; trees with very small crowns, large seams in the trunk, and obvious disease problems; and trees which are directly competing with more desirable, high vigor, healthy trees.

At the same time, a light thinning and pruning of the spruce in type 3 should be undertaken.

Not only will thinning these areas improve their overall health and vigor as well as aesthetics, but the thinning will also serve to act as a safeguard against large-scale windthrow problems when the site is developed later on.

Through the thinning operation, the crown canopy will be opened, allowing wind penetration. Those trees which are most susceptible to windthrow will be removed. Those remaining will develop more widespread root systems and become more windfirm, minimizing the chances for problems with later site development.

It should be pointed out here that several large specimen trees can be found on the property, notably one particular hickory in the north central portion. As much reasonable effort as is possible should be made to retain these in the landscape for aesthetic reasons.

The products derived from the suggested thinning will be primarily firewood, with a small percentage of sawtimber material. This should be sold as a premarked, prepaid, bid sale under a written contract with a performance bond of 10-15% held. Technical advice in this matter can be received from either a state service forester or a professional forester.

2) With the above thinning accomplished, actual site development and clearing and grading can best be done from a forest management standpoint some 3-5 years hence. This allows time for the trees to develop the additional root systems necessary for increased resistance to windthrow. Those trees which may have blown down in the intervening years can be cleaned up at this time.

Special emphasis should be given to the desirability of thinning via a premarked, prepaid, bid sale under a written contract with performance bond overseen and administered by a professional forester. This type of sale, designed by a competent professional forester, may actually enhance property value, particularly if attention is paid to aesthetic values (vistas, screening, etc.), and if the resulting decrease in windthrow hazard is explained to prospective buyers.

C. Aesthetics and Preservation

The development of this tract will call for clearing and grading a substantial portion of the vegetation. Located throughout this area are several large healthy trees which would make ideal specimen trees. These trees have extremely high aesthetic and shade value. They should be worked into the landscape plan for this development where possible.

It should be noted, especially with the wide spread excavating and grading that is necessary in this area, that trees are very sensitive to soil disturbances within their root zones. This zone corresponds to the entire area under a tree's crown. Practices (such as filling and excavating) which disrupt the balance between soil aeration, soil moisture level and soil composition in this zone may cause a decline in tree health and vigor, potentially resulting in tree mortality within three to five years. Mechanical injury to trees may have the same results. Trees which are to be retained should be clearly (but temporarily) marked so that they may be more easily avoided during clearing and bulldozing operations.

With proper controls, the thinning proposed above should have an insignificant impact on water quality. It is recommended that: 1) the thinning not take place during the spring season when heavy rains are expected, 2)skid roads (used for moving trees once felled) generally follow contours and avoid slopes greater than 10%,)3) the yarding area (where trees are brought to be loaded onto logging trucks) should be located on well drained soils with a slight slope for proper drainage, and 4) major skid trails and yarding areas should be seeded with perennial grasses at the end of the operation. These simple practices, combined most importantly with common sense will help reduce erosion problems during the suggested thinning operation.

The Natural Diversity Data Base of the Connecticut Department of Environmental Protection does not have any records of rare, endangered, or threatened species on this site.

IX. PLANNING CONSIDERATIONS

A. Consistency With Existing Plans

The proposed subdivision will place 103 building lots on a parcel of about 304 acres, and lot sizes will average 2+ acres each. Phase 1-B of the project is already under construction, and phase I-A has been submitted to the Inland Wetlands Commission for review. Newtown's 1981 Plan of Development proposes that the area of this subdivision be developed for low density residential use, at 2 to 3 acres per unit. The proposed site is located in an area designated as rural in the State's Conservation & Development Policies Plan. This would allow State funds to be used only for projects which could be served with on-site water supply and sewage disposal, and which were consistent with the area's open, rural character. Given these conditions, the proposal is considered by the Team's planner to be consistent with the character of the area and with local and State plans.

B. Proposed Site Plan

The proposed subdivision is located on the top and slopes of a glacial drumlin. Much of the central and southern portion is relatively flat, but some slopes in other areas, including section I-A approach the town's 10%

slope limit for roads. The steepest slopes have been set aside for open space, as has a 12 acre parcel of flat land in the center of the site. Two north-south open space corridors link this central site to other open space and/or town roads, but there is no open space corridor along the power line r.o.w. from Hanover Rd. to the 12 acre parcel. The Town Plan of Development proposes that the power line r.o.w. be designated for open space.

The road layout appears to be consistent with the town's subdivision regulations. Lots 23 and 24 in Section 1-A are awkwardly divided by the gas line r.o.w. and lot 13 in Section 2-A appears not to meet the "minimum square" requirement of the zoning regulation. Also, a few rear lots have access driveways of 350 to 700+ feet, which could cause problems if they are impassable to emergency vehicles. Careful review of every lot will be called for in view of the drainage and septic system concerns on the site. The drainage review should also take into consideration the fact that the Plan of Development indicates that the area of Hanover Rd./Echo Hill Rd. to the Forest Association property overlies a major aquifer.

C. Recreation and Open Space

The regulations allow the Planning and Zoning Commission to require the designation of 10-15% of the site for open space. Much of the proposed open space is on steep, unbuildable slopes, but much of the central 12 acre parcel is flat. The major constraint with regard to the use of the 12 acre parcel is the power line and its r.o.w. on the northern end. This parcel could be left as it is, developed just for the subdivision residents, or used as a neighborhood recreation area. The actual uses would probably depend on the ages of the future residents and the recreational needs of the surrounding area. The ballfields shown on the developer's plan are only illustrative of what could be done. Because of the need for additional outfield space, uses would actually overlap, and only one of the indicated activities could be done at any one time. There is enough room here for a neighborhood recreation facility. If this were desired, a wider than minimum paving surface may be desirable on Old Farm Hill Rd. from the park to Hanover Rd. Several comments were made by town officials about the desirability of through trails on open space land on this site. The proposed open space has been drawn to avoid conflict with the lots rather than to follow any of the existing trails. The Commission should review this aspect of the proposal carefully to be sure that they gain the access they desire, and that the open space areas to be used as trails are passable on foot.

D. Traffic Generation

The Connecticut Department of Transportation uses a standard of 10.1 trips per day per single family unit in estimating traffic impact of a development. This compares to 6.1 trips for an apartment and 5.1 trips for a condominium. Under this system, leaving home for a destination and returning home would constitute two trips. The completed project would produce about 1,000 trips per day, which the developer's traffic study suggests might be distributed on a 2/1 basis between Boulevard/Hanover Rd. and Walnut Tree Hill Rd. This report also suggests that peak hour traffic would be 1.2 trips per unit, or about 125 trips. The report also statesthat the proposed subdivision would not exceed the capacity of the Boulevard, Hanover Rd. or Walnut Tree Hill Rd. An additional 300-400 units in this area, however, could exceed the consultant's "conservative" capacity estimate on one or more of these roads.

According to the proposed subdivision plan, the developer will correct the alignment and sight line problems at the junction of Echo Valley Rd. and Hanover Rd. Problems beyond the proposed subdivision, such as the narrow railroad overpasses on Hanover and Boulevard and the sight line problems at Old Green and Walnut Hill, will not be corrected, and will probably become more serious as additional subdivisions are proposed in this area.

E. School Impact

According to the 1980 Census, each family in Newtown had an average of 1.1 school-aged children. Those families with school-aged children, in turn, averaged 2.86 such children. Given these facotrs, and a total of 103 units, 113 additional school children could be expected from the completed project. The Superintendent of Schools statedthrough an interview with the Team's planner that the greatest impact would probably be in the middle school and high school due to the higher cost of homes on these lots. He stated that as long as no more than 8-10 children were in any one grade there would be no problems. There will be a temporary decline in middle school enrollments, and a bulge is moving through the high school grades. The Town's elementary schools would be the most seriously affected by large increases in enrollments.

F. Fire Protection

The proposed subdivision is served by both the Sandy Hook and Hook and Ladder fire companies. The first serves the Walnut/Old Green area and the second serves Hanover/Echo Valley. The Chief of Hook and Ladder stated to the Team's planner that coverage would not be a problem, and that the division of responsibility would probably be made by the Fire Commissioners. Cavanaugh Pond, located further down Echo Valley Rd., is a year-round source of water for the fire companies. Although the fire companies could handle fires at the end of a 600-700 foot driveway, taking hoses in by hand if trucks could not get through would have to cause delays in fighting any fire. For public safety reasons, the Newtown Planning and Zoning Commission should encourage the applicant to limit the number and length of driveways to rear lots as much as possible.

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ABOUT THE TEAM

The King's Mark Environmental Review Team (ERT) is a group of environmental professionals drawn together from a variety of federal, state, and regional agencies. Specialists on the team include geologists, biologists, foresters, climatologists, soil scientists, landscape architects, recreation specialists, engineers, and planners. The ERT operates with state funding under the aegis of the King's Mark Resource Conservation and Development (RC&D) Area - a 47 town area in western Connecticut.

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

PURPOSE OF THE TEAM

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

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

REQUESTING A REVIEW

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

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