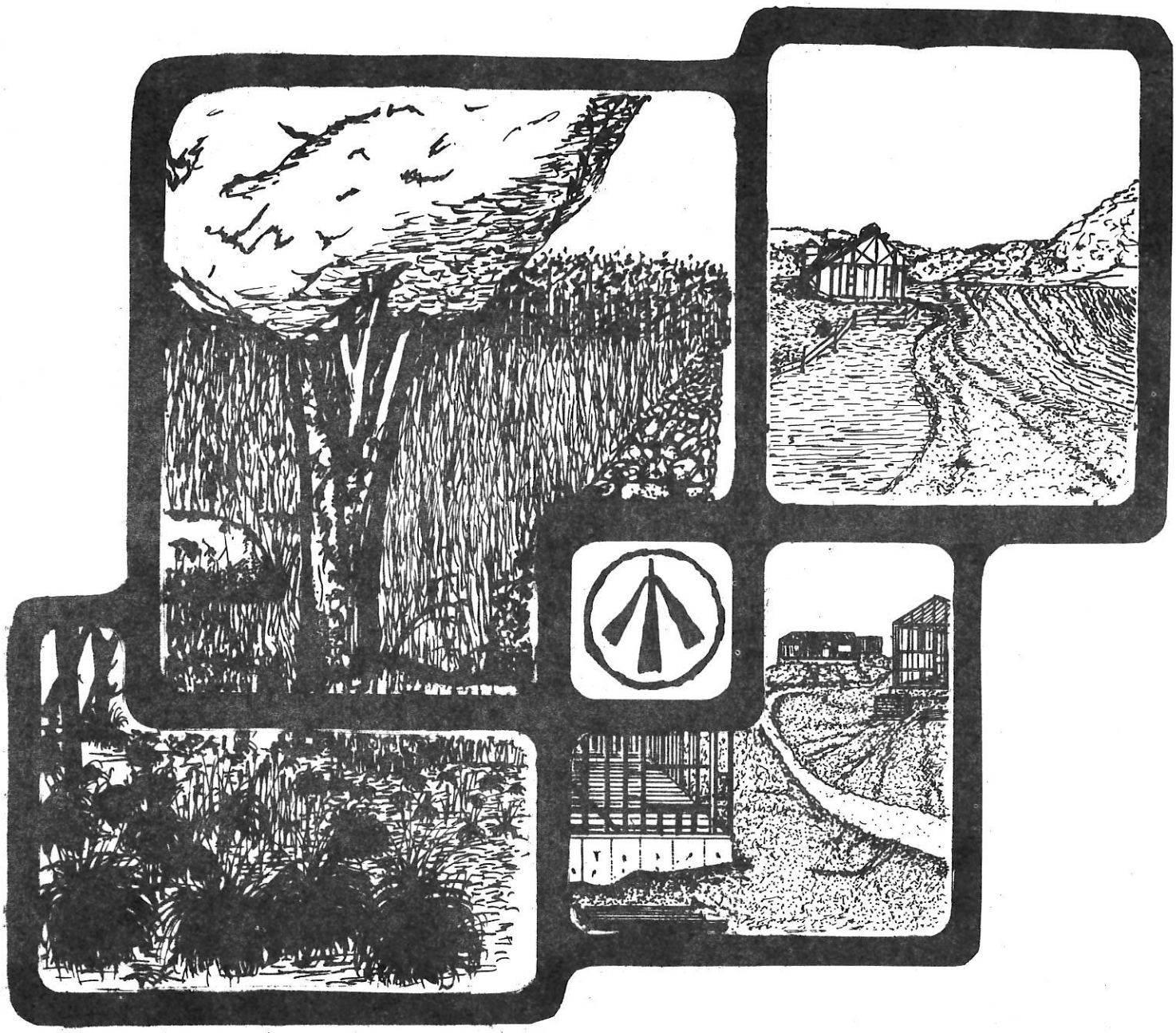
ENVIRONMENTAL REVIEW TEAM REPORT



IVY WOODS SUBDIVISION
WOODBURY, CONNECTICUT

KING'S MARK
RESOURCE CONSERVATION AND DEVELOPMENT AREA

KING'S MARK
ENVIRONMENTAL REVIEW TEAM REPORT

On

IVY WOODS SUBDIVISION
WOODBURY, CONNECTICUT

JULY 1979

King's Mark Resource Conservation & Development Area

Environmental Review Team

P.O. Box 30

Warren, Connecticut 06754

ACKNOWLEDGMENTS

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
DEPARTMENT OF TRANSPORTATION
UNIVERSITY OF CONNECTICUT COOPERATIVE EXTENSION SERVICE

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
LITCHFIELD HILLS REGIONAL PLANNING AGENCY
CENTRAL NAUGATUCK VALLEY REGIONAL PLANNING AGENCY
HOUSATONIC VALLEY COUNCIL OF ELECTED OFFICIALS
AMERICAN INDIAN ARCHAEOLOGICAL INSTITUTE

x x x x x x

Funding Provided By

CONNECTICUT STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION
Stanley J. Pac, Commissioner

Policy Determined By

KING'S MARK RESOURCE CONSERVATION AND DEVELOPMENT AREA

Victor Allan, Chairman, Executive Committee
Stephen Driver, ERT Committee Chairman
Moses Taylor, Coordinator

Staff Administration Provided By

NORTHWESTERN CONNECTICUT REGIONAL PLANNING AGENCY

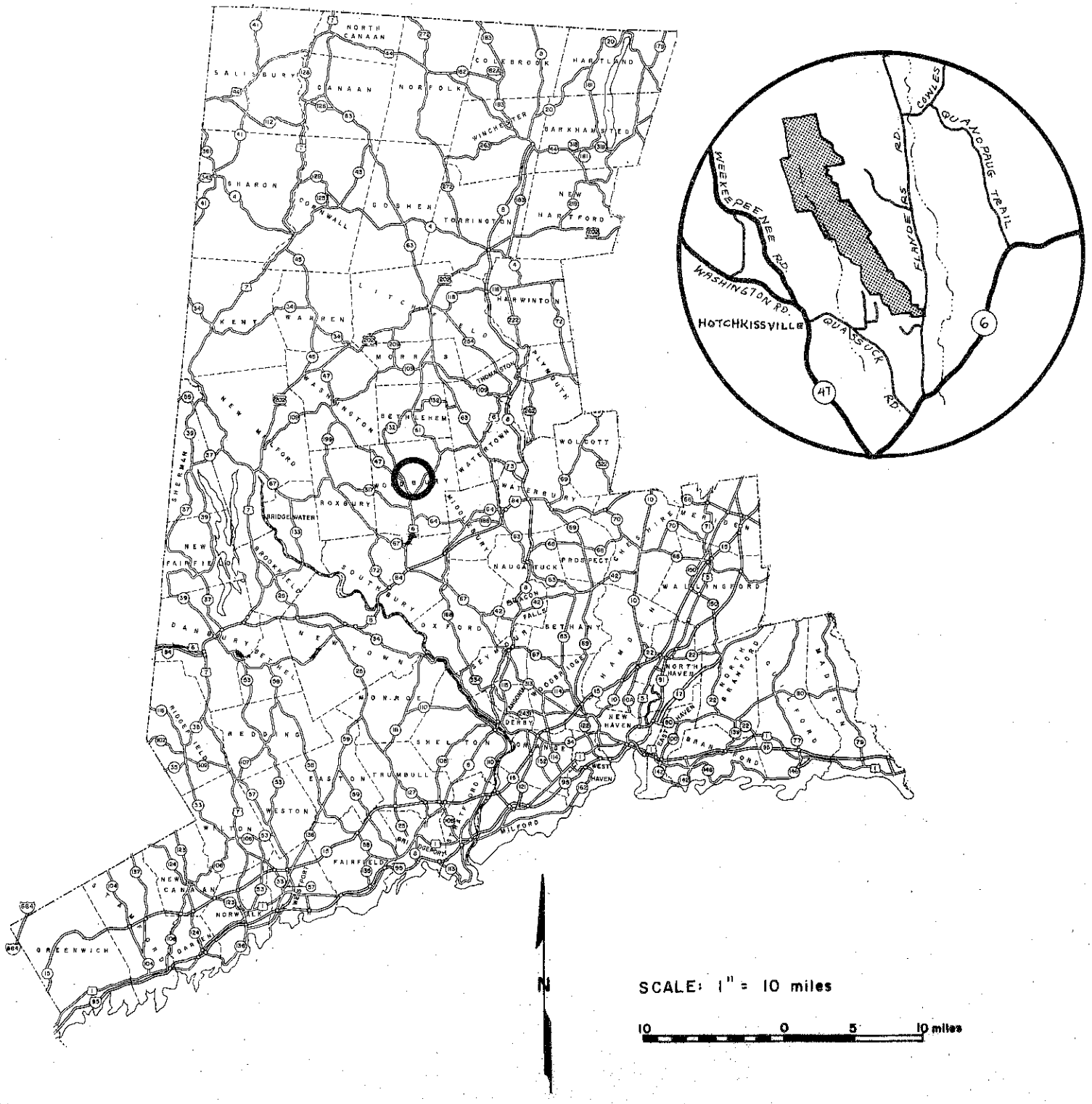
Bruce M. Ridgway, Chairman
Thomas A. J. McGowan, Director
Richard Lynn, ERT Coordinator
Rebecca West, ERT Draftsman
Irene Nadig, Secretary

TABLE OF CONTENTS

LIST OF FIGURES

LOCATION OF STUDY SITE

IVY WOODS SUBDIVISION
WOODBURY, CONNECTICUT



ENVIRONMENTAL REVIEW TEAM REPORT
ON
IVY WOODS SUBDIVISION
WOODBURY, CONNECTICUT

I. INTRODUCTION

The Town of Woodbury, Connecticut is presently reviewing a preliminary application for subdivision of ± 300 acres of land. The subject site is located in the northcentral portion of town, just west of Flanders Road.

Preliminary plans for the proposed "Ivy Woods Subdivision" call for 71 building lots (2+ - 9+ acres in size) and ± 60 acres of open space (see Figure 1). An interior road network of ± 16,200 linear feet is being proposed to service the lots with access via Pilgrim Trail, Flanders Road, and Plumb Brook Road. Domestic water supply is proposed to be provided by on-site wells. Sewage disposal is proposed to be handled by septic systems.

The Planning Commission from the Town of Woodbury requested the assistance of the King's Mark Environmental Review Team (ERT) to help the town in analyzing the proposed development. Specifically, the ERT was asked to identify the natural resources of the site and to highlight preliminary land limitation considerations. Major concerns raised by the town in requesting this review included the impact of the project on soils, storm water runoff, wetlands and traffic.

The ERT met and field reviewed the site on June 6, 1979. Team members for this review consisted of the following:

Mallory Gilbert.....Soil Conservationist.....U.S.D.A. Soil Conservation Service

Russell Handsman.....Archaeologist.....American Indian Archaeological Inst.

Robert O'Connor.....Transportation Planner.....State Department of Transportation

Robert Rocks.....Forester.....State Department of Environmental Protection

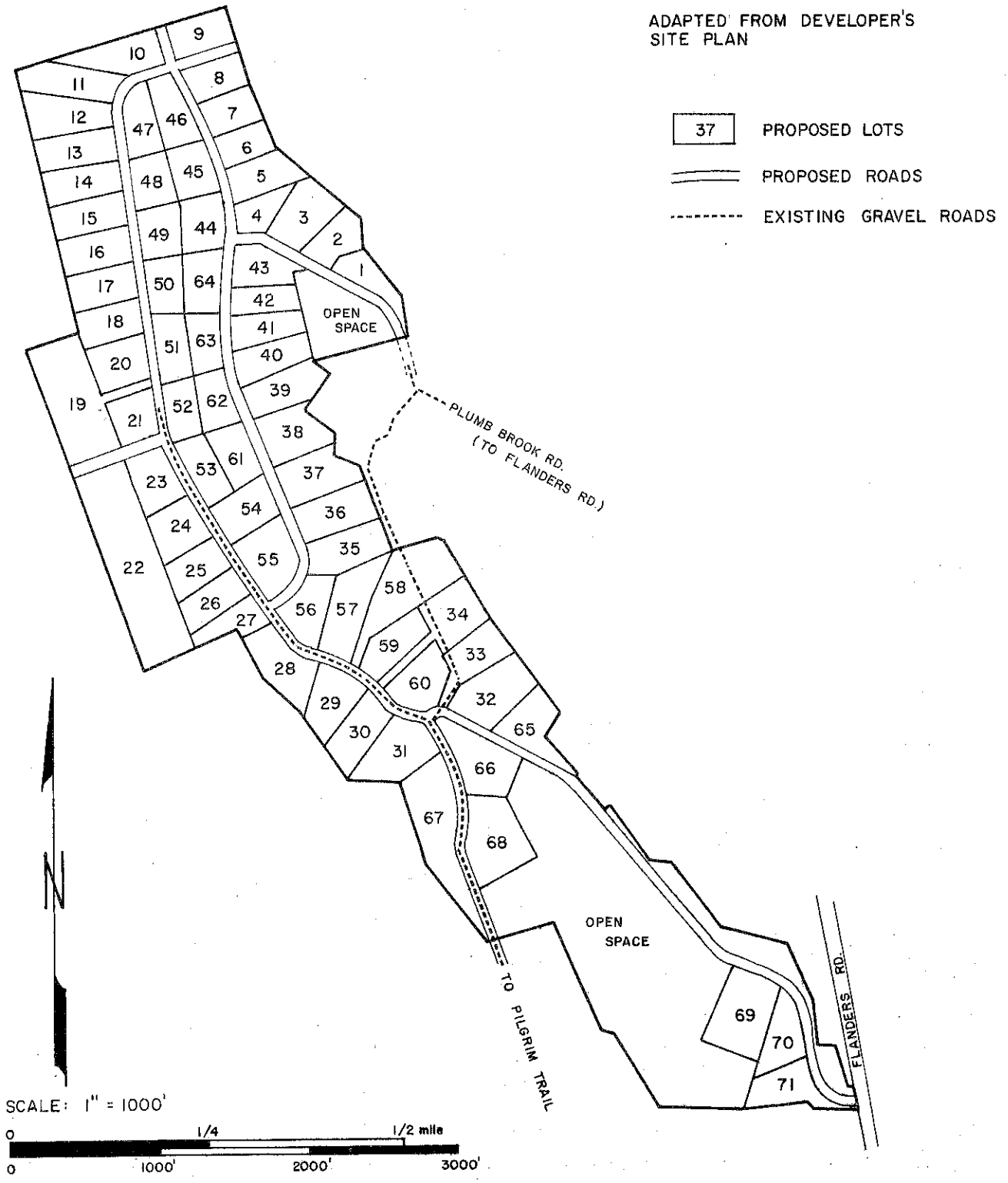
Jeffrey Schmaltz.....Wildlife Biologist.....State Department of Environmental Protection

Michael Zizka.....Geohydrologist.....State 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 detailed soil survey map, a soils limitation chart, a topographic map, and a simplified site plan of the development proposal. 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.

FIGURE I.

SIMPLIFIED SITE PLAN



This report presents the team's findings and recommendations. It is important to understand that the ERT is not in competition with private consultants, and hence does not perform design work or provide detailed solutions to development problems. Nor does the team recommend what ultimate action should be taken on a proposed project. The ERT concept provides for the presentation of natural resources information and preliminary development considerations--all conclusions and final decisions rest with the town and developer. It is hoped the information contained in this report will assist the Town of Woodbury and the landowner/developer in making environmentally sound decisions.

If any additional information is required, please contact Richard Lynn, (868-7342), Environmental Review Team Coordinator, King's Mark RC&D Area, P.O. Box 30, Warren, Connecticut 06754.

* * * * *

II. SUMMARY

- *Existing fill slopes on some sections of the gravel road which enters the property from Pilgrim Trail Road were observed to be excessive and potentially unstable.*

- *Development of the property will increase runoff amounts on the site for given amounts of rainfall. These increases, in turn, will add to peak flows in Plum Brook unless runoff retention measures of some sort are used. It is estimated that peak flow increases in Plum Brook could increase as much as 10 percent for a 50 year, 24 hour storm. With development of the property, it is recommended that a detailed storm water management plan be prepared by the applicant. Consideration should be given, in preparing this plan, to designing a storm water retention system to slow stormwater release into natural drainage ways.*

- *Soils are generally favorable for the proposed residential development in the north and central portions of the property. Elsewhere however, much of the site is characterized by shallow to bedrock conditions which represent a severe limiting factor for implementation of the proposed project. Substantial and expensive modifications will likely be required in these areas to accommodate the proposed development.*

- *Due to steep slopes in portions of the site and the consequent high runoff expectancy, it is recommended that the developer prepare a detailed erosion and sediment control plan to cover each stage of the proposed development schedule. In particular, this plan should address means of keeping sediment from entering active watercourses.*

- *The site is completely forested with a mixed hardwood forest of varying age classes predominating. Excessively drained and shallow to bedrock soils limit tree growth potentials on perhaps twenty percent of this property. Windthrow is a potential hazard on about 175 acres, in this area a light thinning prior to development may help to increase wind-firmness. Approximately 23 acres of this tract is over crowded and would benefit by removal of about one-third of the trees, leaving the healthiest, highest quality trees in the residual stand. No rare or endangered species of either flora or fauna were observed during the ERT field review.*

- *Four wildlife habitat types are present on the property. These include mixed hardwood forest, old field, wetland, and hemlock habitats. The diversity and interspersion of these vegetation types provides good wildlife habitat and many species are flourishing under these conditions. The wetland and abandoned field sections of this parcel are the most valuable wildlife habitats. The principle threat to the existing wildlife population as a result of the proposed development is loss of habitat. However, development of the project as proposed will enhance the suitability of the area for wildlife species associated with homesites such as skunks, racoons, house sparrows, and starlings.*

- *There is no evidence of archaeological deposits within the tract and should the project be approved, it is probable that no archaeological information would be lost.*

- *It is probable that most bedrock floored wells drilled on the property to serve individual homesites will provide adequate yields of water for domestic purposes.*

- *Because of the well drained nature of the soils in most parts of the site and the relatively large sizes of the proposed lots, the establishment of septic systems in many of the lots can probably be accomplished with few problems. On the other hand, areas that have steep slopes or that have bedrock near the surface are of major concern. In such locations, carefully engineered septic systems will probably be required; or, the lots may have to be abandoned.*

- *Preliminary subdivision plans indicate that 27%± of the proposed interior road network is in excess of the desirable maximum gradient of 8% according to AASHO standards. Additionally, many proposed vertical curves are insufficient in length to allow safe stopping sight distances. The project is expected to generate 750± trips onto these local roads daily upon completion.*

- *All three of the proposed access points to the project site have restricted sightline distances which will impede safe and efficient traffic flow.*

III. THE SITE

The ± 300 acre site is located in the north central portion of the Town of Woodbury, just west of Flanders Road. Plum Brook transects the western portion of the property and Pilgrim Trail Road abuts the property on the south.

The parcel is predominantly forested by a mixed hardwood stand of varying age classes. Meandering through this woodland are several un-named brooks and seasonal flows together with some trails and a gravel road. Existing fill slopes on some sections of the gravel road which enters the property from Pilgrim Trail Road were observed to be excessive and potentially unstable.

In general the elevation of the site increases from south to north. Slopes vary from nearly level to almost vertical with minimum and maximum elevations of 350 feet and 780 feet, respectively. The general slope classification of the site is moderate to steep (see Figure 2).

No rare or endangered species of either flora or fauna were observed during the ERT field review; however, the site may harbor some interesting bird species.

IV. GEOLOGY

The Ivy Woods site is located in the Woodbury topographic quadrangle area. Bedrock and surficial geologic maps of that quadrangle have been published by the Connecticut Geological and Natural History Survey (Quadrangle Report No. 3, by R. M. Gates, 1954) and the U. S. Geological Survey (Map GQ-896, by Fred Pessl, Jr., 1970), respectively.

The bedrock that underlies and crops out on the site can be separated into three major groups: Hartland Formation, Nonewaug Granite, and an intermediate unit (see Figure 3). Hartland Formation rocks, which occur in a narrow lobe at the center of the site, consist of interbedded mica quartzites and mica quartz schists. The schists, which have a bright silvery sheen and which are studded with dark red garnets, crop out in several areas, including the western flank of a long, narrow ridge that lies in part along the southwestern boundary of the site. Rocks in the intermediate group surround the Hartland Formation lobe; these include granite, pegmatite, and feldspathic metasediments but are dominated by granitic gneisses. These gneisses are relatively resistant to erosion and form the highest parts of the local topography; erosion of the weaker Hartland schists have resulted in the formation of Plum Brook valley. Nonewaug Granite a fine to coarse grained, massive to layered granite, makes up the northeastern corner of the site. This unit is also more resistant to erosion than the Hartland Formation.

Overlying bedrock on most areas of the site is an unconsolidated glacial deposit known as till. Till consists of rock particles and fragments of various shapes and sizes. These materials accumulated on, within, or beneath an ice sheet as it moved across the land surface, and were redeposited from the ice without being substantially resorted by meltwater. Much of the upper portion of the local till is loose, sandy, and stony, but at depth the till often becomes siltier and very compact. Areas of the site in which numerous exposures of bedrock occur, indicating a relatively thin deposit of till, are shown in Figure 4.

FIGURE 2.

TOPOGRAPHIC MAP

SCALE: 1" = 1000'

0 1/4 1/2mile

0 1000' 2000' 3000'

FIGURE 3. BEDROCK GEOLOGY (adapted from Conn. Geol. Nat. Hist. Survey Quad. Rpt. No. 3)

SCALE: 1" = 1000'

0 1/4 1/2mile

0 1000' 2000' 3000'

HARTLAND FORMATION

INTERMEDIATE UNIT

NONEWAUG GRANITE

FIGURE 4.
AREAS OF NUMEROUS BEDROCK EXPOSURES AND VERY THIN TILL

(Areas indicated by ▨)

SCALE: 1" = 1000'

0 1/4 1/2 mile

0 1000' 2000' 3000'

V. HYDROLOGY

Most of that portion of the site that would be developed into house lots lies within the watershed of Plum Brook, a stream that flows through the western section of the site (see Figure 5). Development will increase runoff amounts on the site for given amounts of rainfall. These increases, in turn, will add to peak flows in Plum Brook unless runoff retention measures of some sort are used. A calculation was made of the peak flow increases to be expected in Plum Brook, both before and after development, at the pond located approximately 11,000 feet south of the point at which the brook flows out of the property (see Table 1). These flows were determined for four different rainfall amounts which occur on an average of once every 10, 25, 50, and 100 years, respectively, and which fall within a continuous 24-hour period. The peak flows listed are estimates based on a simplified soil and land use analysis; their level of accuracy may only be fair. Nevertheless, the calculated percentages of increases in runoff probably offer a reasonable guide to the changes to be expected from development.

Table 1. Estimated peak flows in Plum Brook at the outflow point of the pond southwest of the site. All values listed in cubic feet per second (cfs).

	10-year, 24-hour storm	25-year 24-hour storm	50-year 24-hour storm	100-year 24-hour storm
Before Development	216 cfs	421 cfs	616 cfs	843 cfs
After Development	252 cfs (17% increase)	469 cfs (11% increase)	678 cfs (10% increase)	926 cfs (10% increase)

As Table 1 indicates, peak flow increases at the outflow point of the pond could increase as much as 10 percent for the 50-year and 100-year storms. Increases for less intense storms would be even greater. Although the estimated magnitudes of these increases are not severe, they seem sufficient to warrant a reexamination of downstream structures, such as the dam on the pond and the culvert further downstream, in terms of their capacity to handle such increases. Moreover, the additional flow could aggravate erosion along Plum Brook and accelerate the deposition of sediment in the pond.

With development of this property, it is recommended that a detailed storm water management system be prepared by the developer and reviewed by an engineer representing the town's interests. Consideration should be given in planning the storm water control system to designing a storm water retention system to slow storm water release into natural drainage ways. This is important to minimize the effects of increased runoff on downstream landowners. Naturally, all road and driveway crossings of existing brooks and or wetlands should be accomplished according to a design which meets the town's minimum requirements for culvert sizings, etc.

Connecticut Water Resources Bulletin No. 19 shows that the Pomperaug River valley is underlain by thick stratified drift (sand and gravel) deposits that may have value as a source of large-scale groundwater supplies. Some concern was expressed at the Team's pre-review meeting as to whether the proposed subdivision could affect those supplies. The answer depends in large part upon what ultimate effect the development would have on Plum Brook; any such effect would, in turn, depend heavily on how well septic systems function within the subdivision. Another

FIGURE 5.

WATERSHED OF PLUM BROOK, TO THE POND SOUTHWEST OF THE SITE

major concern would be the effects of road salts or other road-related debris on the stream. If Plum Brook were contaminated, the risk of problems with wells tapping the stratified drift deposits would increase in proportion with increasing proximity of such wells to Plum Brook and with increasing rates of pumping from the wells.

Similar concerns exist about the southeastern third of the site, particularly in the area of proposed lots 69, 70 and 71. Drainage from this section flows into a small pond just south of the site and west of Flanders Road. Dug wells that are currently being used are close to the pond; hence, a decrease in water quality within the pond or the feeder stream may have some influence on the quality of the well water. For this reason, the feasibility of installing properly functioning septic systems in lots 69, 70 and 71 should be assessed before subdivision of that section of the site proceeds. The possibility of contamination of the pond by road salt, sand, or other debris from the proposed new road should also be weighed. Peak flow changes in the southeastern section of the site would probably be small with the implementation of the proposed project.

VI. SOILS

A detailed soil survey map and soils limitation chart of the tract is presented in the Appendix of this report. The soils map illustrates the geographic location of all soils identified on the property. The soils limitation chart identifies limiting factors for various land uses on individual soil types and also rates the severity of these limitations as determined by the U.S.D.A. Soil Conservation Service.

Basically there are eight major soil types on the property (see Figure 6). A brief description of each of these soils is presented below (refer to Figure 6).

Charlton Soils: The Charlton series consists of deep, well drained, nearly level, or undulating to hilly soils that developed in friable to firm glacial till. These soils are well distributed on uplands throughout Litchfield County. They are stony to very stony on about two-thirds of their total acreage. Permeability is moderate to moderately rapid throughout. These soils are classified as fine sandy loam. Except where slope and stoniness are problems, they are well suited for homesites, landscaping, septic fields and roads.

Gloucester Soils: The Gloucester series consists of somewhat excessively drained soils that developed in very friable, coarse-textured glacial till. The till was derived mainly from coarse-textured granite but in places included some gneiss. Consequently, the soil material has a relatively high content of sand. Except where slope and stoniness are problems, they are well suited for development.

Hollis Soils: The Hollis series consists of well-drained or somewhat excessively drained, gently sloping to steep soils that are very shallow or shallow over crystalline bedrock, including schist and gneiss. These soils developed in a thin mantle of glacial till with the underlying residuum derived from bedrock. The general development rating for this soil type is severe.

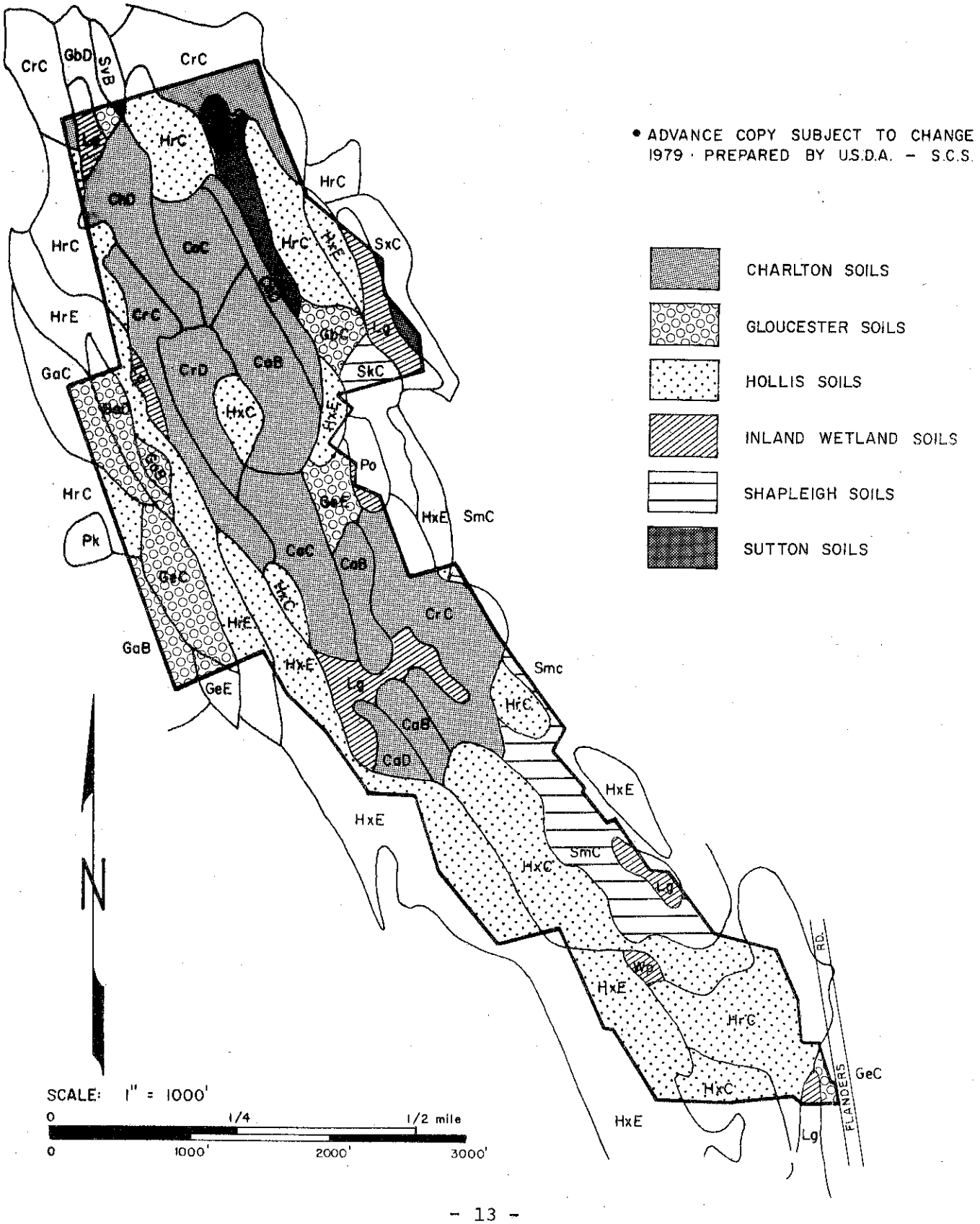
* Leicester, Ridgebury and Whitman: This undifferentiated unit is made up of poorly and very poorly drained soils. All of these soils are nearly level. Stones and excess water make them unsuitable for development. These soils do, however, offer good potential as habitat for wetland wildlife.

---

* Inland Wetland soils as defined by P.L. 155, as amended.

FIGURE 6.

MAJOR SOIL TYPES



*Podunk Soils: The Podunk series consists of moderately well drained soils that lie on flood plains along the major streams and their tributaries. These soils formed in sediments derived from granite, gneiss, schist, and other rocks. Their permeability is moderate or moderately rapid. Podunk soils are not acceptable for development without extensive flood control and/or subsurface drainage measures.

Shapleigh Soils: The Shapleigh series consists of somewhat excessively drained soils that developed in a thin mantle of glacial till with the underlying residuum derived from bedrock. These soils are shallow to crystalline bedrock, which consists principally of coarse-grained Nonewaug granite and associated pegmatite material. The general development limitation rating for this soil type is severe.

Sutton Soils: The Sutton Series consists of moderately well drained, nearly level to sloping soils that developed in glacial till of late Wisconsin age. The till was derived mainly from schist but included varying amounts of granite and gneiss. Their permeability is moderate or moderately rapid. Seasonal wetness may be a problem.

*Whitman Soils: The Whitman series consists of very poorly drained, nearly level soils that occupy uplands. They developed in glacial till of late Wisconsin age. The till was derived mainly from schist, gneiss, and granite. These soils occur in low-lying, small to medium-sized areas, where they receive runoff and, in places, material washed from surrounding soils. Their permeability is moderate. These soils in their native state are unsuitable for development.

Soils Vs. Proposed Land Use

The major soils limitations for the proposed development center on the subsurface geology of the area. As shown in Figure 4, bedrock is within a few feet of the soil surface on a large percentage of the site (approximately 42%). This shallow to bedrock condition represents a severe limiting factor for implementation of the proposed project. Although some inclusions of other soil types may be encountered within these shallow to bedrock areas which are more favorable for development, the shallow to bedrock areas themselves will likely require substantial and expensive modifications to accommodate the proposed development. For example, blasting could be necessary for basement excavations and road construction; and costly engineering may be required for septic system installation.

Soils are more acceptable for homesite development in the north and central portion of the property. These soils, predominantly of the Charlton and Gloucester Series, pose few problems for homesite development, septic system installation and road construction. Only those sites which have steep slopes (8% or greater) or numerous large stones pose moderate to severe problems.

The wetland soils which occur within this parcel are of two types. The Podunk soils are susceptible to occasional flooding, and a seasonally high water table which fluctuates with stream flow. Podunk soils are not acceptable for development without flood control and subsurface drainage measures.

The other types of wetland soils on the property, the Leicester, Ridgebury and Whitman soils, were derived from glacial till and are usually found in low lying areas where they receive runoff from other areas. They have a seasonally high water table and are generally unsuitable for development.

As a general rule, wetland soil types should be avoided during development. Development of large wetland soil areas is not considered environmentally sound for several reasons; wildlife habitat is lost, aquifer recharge is reduced, temporary storage of runoff waters is reduced, and a "sink" for pollution filtration is reduced or lost.

Nonetheless, careful crossings of wetland soils with permeable road base materials is considered acceptable if limited to short expanses. Also, proper culvert sizes should be specified and approval by an engineer representing the town's interest.

A summary of the suitability of the existing soils to support the proposed land use is portrayed in Figure 7. It should be noted that although much of the site presents severe limitations for residential development, this does not necessarily preclude use of the site for this purpose. It does imply that expensive and extensive modifications would be necessary to assure an environmentally sound development.

Soil Loss and Sedimentation

Due to steep slopes and high runoff expectancy, it is strongly recommended that the developer provide the town with a detailed erosion and sediment control plan to cover each stage of the proposed development schedule. Techniques for effective erosion and sediment control are presented in the "Erosion and Sediment Control Handbook - Connecticut" (U.S.D.A. Soil Conservation Service, 1976) available from the Litchfield County Conservation District Office in Litchfield, Connecticut.

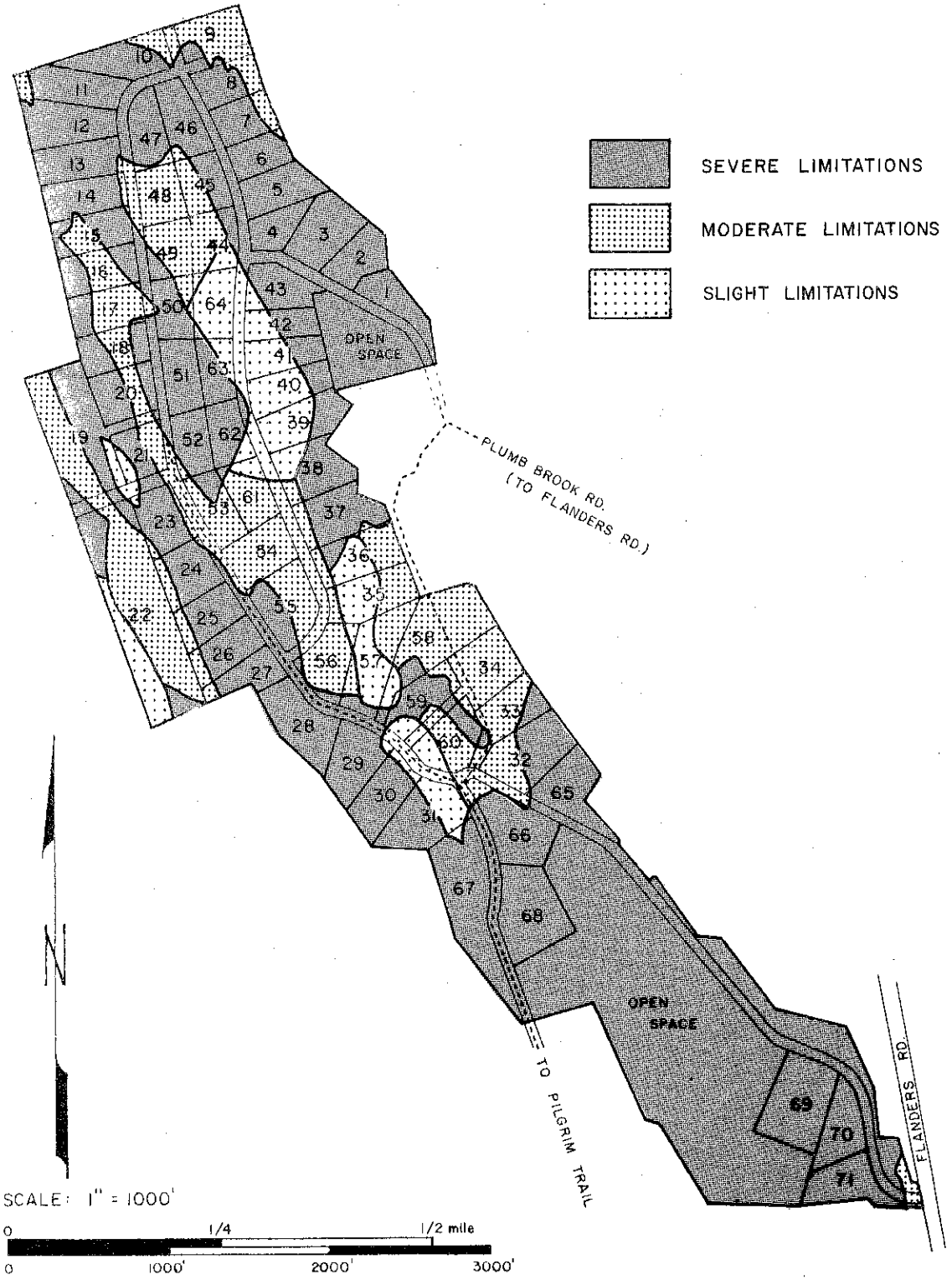
In particular, this plan should address means of keeping sediment from entering active water courses. Some basic items should include:

- Limit soil disturbance during construction.
- Regrade and revegetate exposed areas as the development progresses.
- Attempt to keep cuts and fills at a 2:1 slope.
- Use erosion and sediment controls such as haybale check dams wherever feasible.
- Plan a time schedule for development (i.e. do not do wetland related work in the spring. Wait for low flows and a lower water table.)
- Provide for sediment traps in the storm water management system and provide for their continual maintenance. (If not maintained, sediment cannot be adequately controlled.)
- It is advisable to complete each section of the proposed road (with culverts and sumps) before the lots along that section are developed. This includes road bank stabilization and/or revegetation.
- No soils should be left exposed during the winter months. An annual grass should be seeded on these areas.

FIGURE 7.

DEVELOPMENT LIMITATIONS MAP*

* BASED UPON SOIL LIMITATION RATINGS OF U.S.D.A. SOIL CONSERVATION SERVICE FOR SEPTIC SYSTEMS, BUILDINGS WITH BASEMENTS AND ROADS OR DRIVEWAYS



VII. VEGETATION

The ± 300 acre site proposed for the Ivy Woods Subdivision is completely forested. Six distinct vegetation stands are present on the property (see Figure 8). Presented below is a description of each of these stands, followed by a discussion of a number of forestry related concerns.

Vegetation Type & Descriptions

STAND A. Mixed Hardwoods. This 212 acre fully stock stand is quite variable. On the high ground and ridges where soils are shallow and somewhat excessively drained, uncrowded slow growing, pole to sawlog size chestnut oak, black oak, white oak, American beech, pignut hickory, and shagbark hickory dominate with low numbers of red maple and black birch. Mountain laurel, hardwood tree seedlings, chestnut sprouts, hemlock, and mapleleaf viburnum are present in the understory. Ground cover vegetation is primarily made up of club moss, Canada Mayflower, and poison ivy. On the lower slopes and valley bottoms where greater moisture is available to trees, pole to sawlog size tuliptree, white ash, red oak, red maple, sugar maple, and yellow birch are becoming crowded. The dense understory vegetation in this area is primarily made up of maple leaf viburnum, highbush blueberry, spicebush, and witch hazel. Skunk cabbage, Christmas fern, wood fern, Jack-in-the-pulpit, trillium, violet, wild geranium, and Solomon's seal, form the almost continuous ground cover in this area.

STAND B. Mixed Hardwoods. Sapling to pole size white ash, red maple, sugar maple, black oak, and red oak are shading out the red cedar and gray birch present in this crowded 23 acre stand. Several medium quality sawlog size sugar maples are located in close proximity to the stone walls within this stand. Understory vegetation has not become established as yet in this area. This stand's ground cover consists of grasses, Canada Mayflower, club mosses and poison ivy.

STAND C. Old Field. Sapling size red oak and red maple are becoming established with the sapling size red cedar, gray birch, and quaking aspen which are present in this 21 acre understocked stand. Gray stemmed dogwood, cherry seedlings, Autumn olive, spirea, goldenrod, ragweed, grasses, wild strawberry, dewberry, cinquefoil (common and tall), deertongue, and other assorted wildflower species dominate this area.

STAND D. Oak Ridge. This 18 acre uncrowded stand is made up of pole size chestnut oak (which are stunted in appearance) plus scattered pole size scarlet oak and occasional hemlock. The understory vegetation in this stand consists of Mountain laurel with red maple and black birch seedlings. Lowbush blueberry, huckleberry, and common polypody form this area's ground cover.

STAND E. Hemlock. Pole size hemlock, growing on shallow soiled ridge tops, are the predominant species in this 15 acre uncrowded fully stocked stand. Chestnut oak, scarlet oak, and American beech are also present. Where enough sunlight reaches the forest floor, lowbush blueberry and huckleberry have become established. The trees in this stand are slow growing but reasonably healthy.

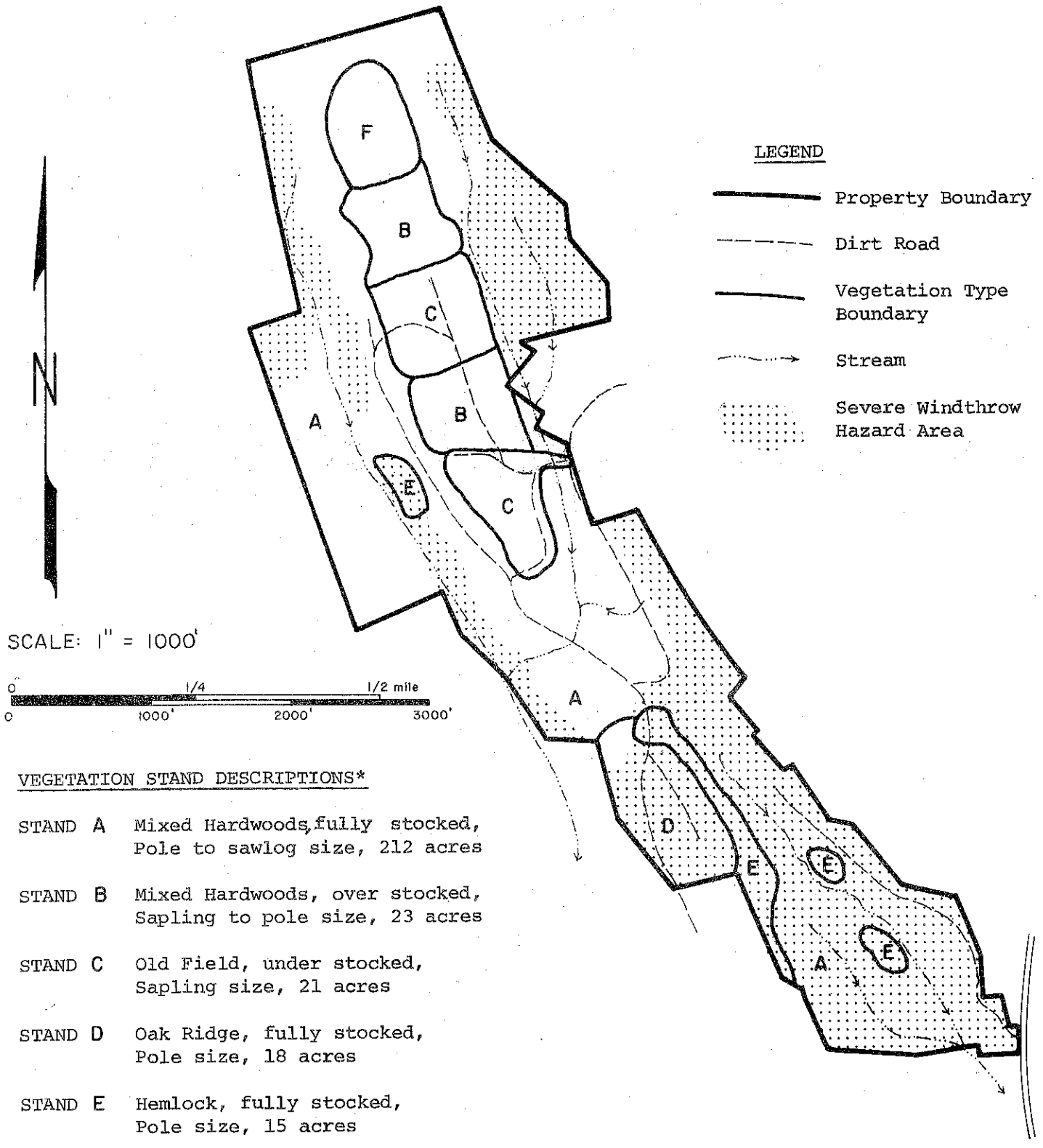
STAND F. Mixed Hardwoods. Sapling to pole size white oak, scarlet oak, red maple, and black cherry are present in this uncrowded 11 acre stand. This understory is dominated by hardwood tree seedlings. Ground cover vegetation consists of grasses, Canada Mayflower, and huckleberry.

Aesthetics and Preservation

An effort should be made to preserve the healthiest trees on this tract for aesthetics, shade, wildlife habitat and environmental stability. In many

FIGURE 8.

VEGETATION TYPE MAP



VEGETATION STAND DESCRIPTIONS*

STAND A Mixed Hardwoods, fully stocked, Pole to sawlog size, 212 acres

STAND B Mixed Hardwoods, over stocked, Sapling to pole size, 23 acres

STAND C Old Field, under stocked, Sapling size, 21 acres

STAND D Oak Ridge, fully stocked, Pole size, 18 acres

STAND E Hemlock, fully stocked, Pole size, 15 acres

STAND F Mixed Hardwoods, fully stocked, Sapling to pole size, 11 acres

* Seedling size = trees less than 1 inch in diameter at breast height (d.b.h.)
Sapling size = trees 1 to 5 inches in d.b.h.
Pole size = trees 5 to 11 inches in d.b.h.
Sawlog size = trees 11 inches and greater in d.b.h.

cases healthy trees on a lot may enhance the value of that lot by as much as twenty percent. Trees which are to be preserved should be protected from mechanical injury and also unnecessary soil disturbances in the area under their crowns.

Limiting Conditions

The excessively drained and shallow to bedrock soils in parts of Stand A (shaded portions on vegetation type map), and all of Stand D and E, limit tree growth rates and to some extent restrict species composition. The lack of adequate moisture, especially during the spring rapid growth season causes the trees (particularly in Stand D, Oak Ridge) to be slow growing and even stunted. It is not economically feasible to manage Stands D and E for timber production.

Potential Hazards and Mitigating Practices

Windthrow is a severe hazard in parts of Stand A and most of Stand D and E (see vegetation type map, severe windthrow hazard area). The soils in these areas are shallow to bedrock and tree root systems are of limited depth. This hazard is lessened where the underlying bedrock is highly fractured, because tree roots can penetrate deeper and become more securely anchored. The windthrow hazard is increased in the valley bottoms even though the soils are somewhat deeper, because availability of adequate moisture has resulted in taller growing trees. These tall trees rely on each other for wind firmness and overall stability. Large openings made in these areas which allow wind to pass through rather than over these stands may increase the windthrow hazard. The creation of such openings should be avoided where possible.

A light thinning in the part of Stand A where the windthrow hazard is high may, over time, increase wind firmness by reducing competition between residual trees. This reduction of competition should cause an increase in root and crown spread and, in turn, improve stability.

The rough terrain over many areas of this tract may require extensive excavating, filling, and grading for construction of roadways, buildings, and septic systems. These actions disturb the balance between soil aeration, soil moisture level and soil composition. Trees are very sensitive to changes in the soil condition within the entire area under their crowns. Soil disturbances and direct mechanical injury may cause a decline in tree health and vigor and even death within three to five years. Great care should be taken not to disturb the soil near the trees or to cause mechanical injury to trees that are to be preserved. Individual trees and even groups that are to be saved should be temporarily but clearly marked so they may be avoided more easily.

Suggested Management Techniques

The trees in Stand B (mixed hardwoods) are crowded and beginning to show signs of stress. They would benefit by a fuelwood thinning that would remove one-third of the volume or approximately 3 cords per acre. This thinning should be focused on removing unhealthy and poor quality trees and those trees which are directly competing with healthy trees. This thinning will reduce competition between residual trees for space, light, water and nutrients. Over time, as a result of the thinning, the trees in this stand should become healthier, more stable, and better able to cope with the environmental stresses brought about by development.

As mentioned earlier, a light thinning in those parts of Stand A where the windthrow hazard is severe, should help to increase wind firmness and improve the stability of the residual trees. Ideally these thinnings should be implemented several years before any further development takes place. This will give the residual stand a chance to become healthier and more stable, and better able to withstand the disturbances caused by subdivision of the property. At the time of thinning, a trail network and perhaps a picnic area could be laid out in the open space area to provide an added amenity to the subdivision.

If the subdivision is developed as proposed, trees cleared for roads, driveways, buildings, and septic systems should be utilized as fuelwood and, where feasible, as sawlogs.

If the proposed thinnings are agreed to, a consultant forester should be contacted to mark and oversee the harvest operation. Revenues from the thinnings will more than cover the costs of hiring a consultant.

Open Space

Approximately 60 acres of this tract are proposed for open space. Much of this land is characterized by steep slopes, wetlands, or shallow to bedrock conditions. While it is true that these are environmentally sensitive areas and should be protected, it is also true that the potential of this land for woodland products, wildlife habitat management and recreational use is quite limited. The most suitable land on the parcel for recreational use, forest management and wildlife habitat management is the same land most suitable for homesite development (see Figure 7).

As a general rule, it is desirable for a town to establish criteria for the acceptance of municipal open space. In this way, the attributes and values of a particular parcel can be determined and compared with municipal needs. It may, for example, be desirable in some subdivisions to have land set aside for open space use which is suitable for active recreational development (ball fields, tennis courts, etc.) or multiple use management (passive recreation, wildlife habitat, forest products).

Alternative land uses for area

A cluster development where only the optimum areas are utilized for clustered residences may be a feasible alternative for this tract. The areas which present severe development difficulties could be designated as open space and left in their natural condition or possibly managed for multiple uses (recreation, wildlife habitat and forest products). A landowners' association could be established to assume responsibility for management of the open space.

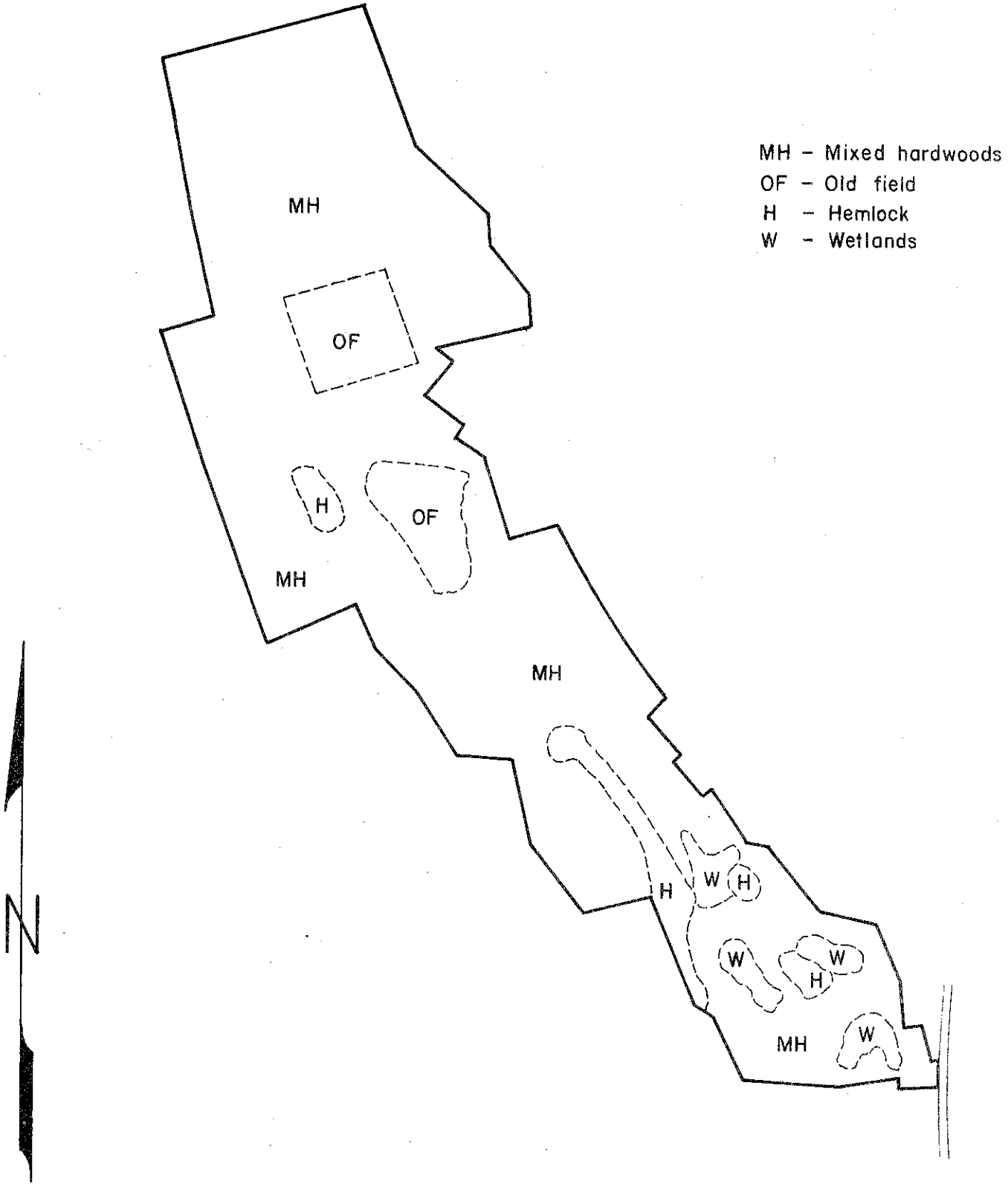
VIII. WILDLIFE

The 300 acre Ivy Woods site includes four wildlife habitat types. The distribution of these types is shown in Figure 9.

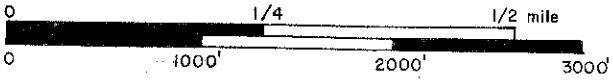
Mixed hardwood forest is the principle habitat type. Tree species include oaks, hickories, maples, and birches. The understory consists of mountain laurel, maple leaf viburnum, and various hardwood seedlings. Wildlife species utilizing this type include white-tailed deer, grey squirrel, ruffed grouse, scarlet tanager, wood frog and box turtle.

FIGURE 9.

WILDLIFE HABITAT TYPES



SCALE: 1" = 1000'



The old field areas are presently reverting to forest with sapling red oak, quaking aspen, and grey birch becoming established. Sapling red cedar are scattered through the area along with shrubs such as grey-stemmed dogwood, autumn olive, meadow-sweet and various grasses. Many species utilize this habitat exclusively. Among these are cottontail rabbits, meadow voles, and numerous songbirds. Wide-ranging species such as hawks and foxes often hunt these areas for the afore-mentioned animals. Woodland wildlife such as white-tailed deer and ruffed grouse also take advantage of the wide variety of food plants available here.

Diversity of vegetation is also found in the wetland areas. Red maple is the predominant tree species. Valuable wildlife shrubs such as grey-stemmed dogwood, shadbush, and spicebush are abundant. Ground vegetation includes skunk cabbage, false hellebore, ferns, and numerous grasses and sedges. This habitat type provides breeding grounds for many amphibians including frogs, toads, and salamanders. Numerous songbirds nest in both the shrub layer and the higher tree layer.

The hemlock stands scattered throughout the parcel provide nesting cover for songbirds such as the mourning dove and purple grackle. Chipmunks and red squirrels may also be present. For the most part however, this type affords little wildlife habitat due to the lack of understory and ground vegetation.

The Ivy Wood Subdivision is representative of the majority of wildlife habitat types found in the undeveloped sections of Woodbury. The diversity of vegetation associated with interfaces of two or more habitat types, in this case hardwood forest, abandoned field and wetlands, provides wildlife with ample food, nesting cover and escape cover. Many species are presently flourishing under these conditions. The principle threat to these animals as a result of the proposed development is loss of habitat. Although numerous such areas remain in Woodbury, on a regional or statewide basis they are disappearing rapidly. As a result, the aesthetic, educational, ecological and recreational values offered by such areas are diminishing.

The wetland and abandoned field sections of this parcel are the most valuable wildlife habitats. Leaving these areas as open space will incur the least unfavorable impact on the wildlife present.

On the other hand, development of the area as proposed will enhance its suitability for wildlife species associated with homesites such as skunks, raccoons, house sparrows and starlings. Growth of new herbaceous and shrub vegetation will be encouraged as mature forest is converted into open land. Lawn installation and shrub planting will also provide new habitat.

IX. CULTURAL RESOURCES

A field study of the Ivy Woods tract did not locate any prehistoric or historic cultural resources which would be adversely impacted by the proposed residential subdivision and construction. The American Indian Archaeological Institute's site files do not include any prehistoric archaeological sites within the project area.

An archival search, using the 1874 Beers' Atlas of Litchfield County, revealed that there were no structures on the tract in the mid-to-late 19th century.

Brief field studies confirmed this information. Evidently this tract was used for either the production of food crops or as pasture during the historic period. Neither of these activities would leave recognizable traces in the archaeological record.

Evidence from the Beers' Atlas as well as the earlier (1859) Richard Clark map of Litchfield County also indicates that the entire region within the Plum Brook drainage area (Hogpen Hill and Brushy Hill area) was not occupied during the 19th century. Historic use and occupation was centered along Flanders Road (Meadow Brook) and the valley floor of the Weekeepeemee River; to the east and west of the project area.

In view of this information, the Institute feels that there is a low potential for archaeological deposits within the tract. There is no need for subsurface testing and should the project be approved, it is probable that no archaeological information would be lost.

X. WATER SUPPLY

Individual on-site wells are proposed to supply water to the subdivision. Because of the lack of a suitable sand-and-gravel aquifer on the property, wells would probably be drilled into bedrock. The crystalline bedrock underlying the site can supply water through fractues, but the distribution of these fractures is irregular. Since the potential yield of any new bedrock-based well depends in large part upon the size and number of fractues encountered by the well, it is very difficult to predict the yield. Nevertheless, it is possible to estimate the probability of obtaining certain yields at any given location within the subdivision.

Because of the different physical characteristics of schists as compared to granites and gneisses, the latter types of rocks tend to have more open fractures and, hence, to produce more groundwater for wells. On the Ivy Woods site, the Hartland Formation rocks may be classified as schistose, while the other rock units are largely granitic or gneissic. Groundwater yields from wells tapping the Hartland Formation are therefore likely to be less, on the average, than those from the other units. Table 2 shows the percentage of wells studied within the lower Housatonic River basin that yielded groundwater at specific rates (source: Connecticut Water Resources Bulletin No. 19). *

Table 2. Average percentage of bedrock-based wells studied in the lower Housatonic River basin that have yields equal to or greater than those listed. Source: Connecticut Water Resources Bulletin No. 19. Yields in gallons per minute (gpm).

Yields	1 gpm	2 gpm	3 gpm	5 gpm	10 gpm
Schist-based wells	92%	79%	69%	47%	18%
Granite-based wells	95%	90%	84%	66%	28%

*NOTE: A well yield of 3 gpm is generally considered to be adequate for an average home; smaller yields may be offset by the provision of storage space within the well.

XI. SEPTIC SYSTEMS

Because of the well-drained nature of the soils in most parts of the site and the relatively large sizes of the proposed lots, the establishment of septic systems in many of the lots can probably be accomplished with few problems. On the other hand, areas that have steep slopes or that have bedrock at or near the surface are of major concern. In those locations, engineered septic systems will probably be required; or, the lots may have to be abandoned.

Both steep slopes and shallow soil conditions can cause premature surfacing of effluent; that is, surfacing before adequate renovation has occurred in the soil. This event can produce both an aesthetic nuisance and a health hazard. In shallow soil areas, insufficient renovation can lead to the entrance of contaminated groundwater into the bedrock fracture system, the probable source of water supply for the subdivision. Where filling is proposed to overcome shallow soil limitations, it is important to assure that all parts of the drainage field are raised to at least the minimum required distance (four feet) over the underlying rock. It is also important to provide for proper compaction of the fill to prevent the effluent from flowing along the soil-fill boundary and breaking out at the edge of the "mound".

XII. TRAFFIC ANALYSIS

The preliminary subdivision plans call for ± 16,200 feet of interior roads connecting to 3 access points at Flanders Road, Plumb Brook Road and Pilgrim Trail (see Figure 1). These plans also show 27%± of the proposed interior roadways in excess of the desirable maximum gradient of 8% according to the AASHO* standards. There was also an additional 17%± in excess of the town's design standard maximum grade of 6%. Additionally, many proposed vertical curves are insufficient in length to allow safe stopping sight distances. It is recommended that the developer's designer reduce the grades and unnecessary vertical curves to minimize the effect on the stopping sight distances. The project is expected to generate 750± trips onto these local roads daily.

Flanders Road, at the area of the proposed access, is a winding bituminous concrete roadway in good condition, 20' in width, and on a 6%± vertical grade. The first access onto Flanders Road indicates 150'± of frontage which begins 110'± north of Elephant Rock Road to the Antonacci property at 125 Flanders Road. It is understood that this proposed access road will be located at the existing Antonacci driveway and will also accommodate the relocated driveway. This location meets the minimum offset distance requirement from the intersection of Elephant Rock Road. The intersectional sight distance to the north along Flanders Road from this drive is limited to 100'±. Slope rights will be required to establish a recommended minimum sightline of 350'. The sight distance to the south along Flanders Road is adequate. The volume of traffic generated by this project will not have any detrimental effect on Flanders Road if the above referenced guidelines are followed.

* American Association of State Highway Officials

Plumb Brook Road is a winding, oiled, 20' wide road in poor condition. The road presently dead-ends approximately one-half mile from Flanders Road. The approach onto Flanders Road is at a skew angle of 70 degrees on a descending grade of 8%. Sightlines along Flanders Road are limited to 80'± northerly and 90'± to the south. This intersection is substandard and should be reconstructed to a "T" type to provide the necessary minimum sightlines of 350'.

Along with upgrading this intersection it would be desirable to upgrade the entire Plumb Brook Road to accommodate any additional volumes.

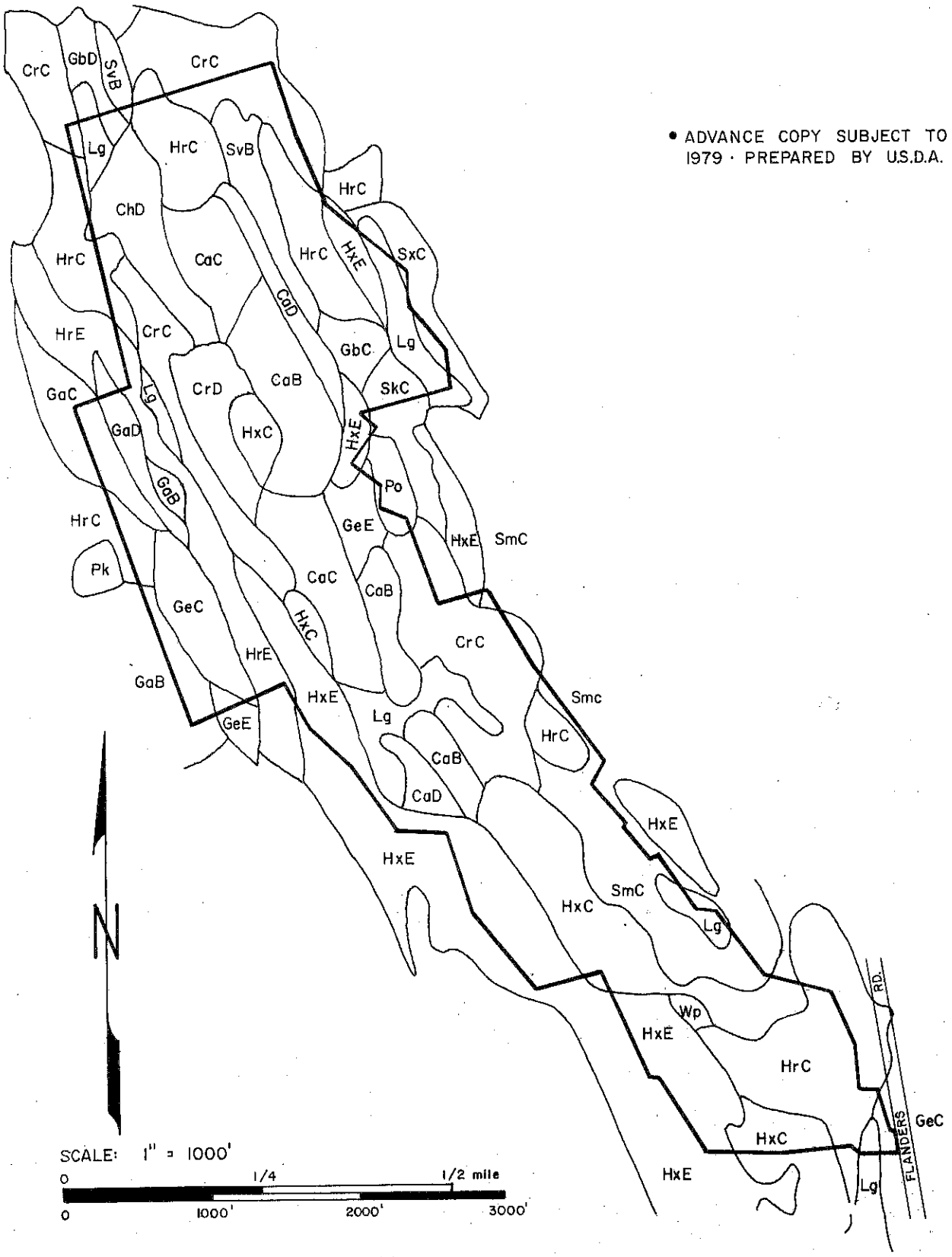
The preliminary plans dated January 3, 1979 did not indicate the right-of-way in the area where the proposed Plumb Brook roadway would connect to Plumb Brook Road. It is recommended that the right-of-way along the inside of the proposed "broken back" horizontal curves (located just off the present property boundary) be sufficient to accommodate adequate sightlines for vehicles descending the 6% vertical grade.

Pilgrim Trail is a 28' bituminous pavement in fair condition with a vertical grade of 10%. This road intersects with Arrow Way which then intersects with Quassuck Road. This area (Quassuck Heights) is well developed including 5 apartment buildings. The intersection at Quassuck Road is at a skew angle of 60 degrees and in the vicinity of a crest vertical curve. These conditions severely limit the sightlines to 70'± for southbound vehicles egressing Quassuck Road and 100'± for vehicles entering Quassuck Heights from the north on Quassuck Road. This intersection should also be realigned to a "T" type that provides minimum sightlines of 350' along Quassuck Road.

An analysis of the latest 3 year accident history (1975-1977) revealed the following: No accidents at the intersection of Flanders Road and Route 6, 2 accidents at the intersection of Quassuck and Route 6 and 3 accidents at the intersection of Route 47 and Quassuck Road. It is felt that the volumes generated onto these state roads by the project will have no detrimental effect to these locations.

APPENDIX

SOILS MAP



• ADVANCE COPY SUBJECT TO CHANGE
1979 · PREPARED BY U.S.D.A. – S.C.S.

SOILS LIMITATION CHART

IVY WOODS SUBDIVISION

MAP SYMBOL	SOIL NAME	SEPTIC ABSORBTION FIELDS		BUILDINGS W/ BASEMENTS		ROADS OR DRIVEWAYS		LANDSCAPING	
		RATING	REASON	RATING	REASON	RATING	REASON	RATING	REASON
CaB	Charlton fine sandy loam, 3-8% slopes	Slight	--	Slight	--	Slight	--	Slight	--
CaC	Charlton fine sandy loam, 8-15% slopes	Moderate	Slope	Moderate	Slope	Moderate	Slope	Moderate	Slope
CaD	Charlton fine sandy loam, 15-25% slopes	Severe	Slope	Severe	Slope	Severe	Slope	Severe	Slope
ChD	Charlton stony fine sandy loam, 15-25% slopes	Severe	Slope	Severe	Slope	Severe	Slope	Severe	Slope
CrC	Charlton very stony fine sandy loam, 3-15% slopes	Moderate	Large stones	Moderate	Large stones, Slope	Moderate	Slope	Moderate	Large stones
CrD	Charlton very stony fine sandy loam, 15-35% slopes	Severe	Slope	Severe	Slope	Severe	Slope	Severe	Slope
GaB	Gloucester sandy loam 3-8% slopes	Slight	--	Slight	--	Slight	--	Moderate	Small stones
GaC	Gloucester sandy loam 8-15% slopes	Moderate	Slope	Moderate	Slope	Moderate	Slope	Moderate	Slope, Small stones
GaD	Gloucester sandy loam 15-25% slopes	Severe	Slope	Severe	Slope	Severe	Slope	Severe	Slope
GbD	Gloucester stony sandy loam, 15-25%	Severe	Slope	Severe	Slope	Severe	Slope	Severe	Slope
GeC	Gloucester very stony loam, 3-15% slopes	Moderate	Large stones	Moderate	Large stones	Moderate	Slope	Moderate	Large stones
GeE	Gloucester very stony sandy loam, 15-35% slopes	Severe	Slope	Severe	Slope	Severe	Slope	Severe	Slope

SOILS LIMITATION CHART
IVY WOOD SUBDIVISION

MAP SYMBOL	SOIL NAME	ABSORBTION FIELDS		BUILDINGS W/ BASEMENTS		ROADS OR DRIVEWAYS		LANDSCAPING	
		RATING	REASON	RATING	REASON	RATING	REASON	RATING	REASON
HrC	Hollis very rocky fine sandy loam, 3-15% slopes	Severe	Depth to rock	Severe	Depth to rock	Severe	Depth to rock	Severe	Depth to rock
HrE	Hollis very rocky fine sandy loam, 15-35% slopes	Severe	Depth to rock	Severe	Depth to rock	Severe	Depth to rock	Severe	Depth to rock
HxC	Hollis extremely rocky fine sandy loam, 3-15% slopes	Severe	Depth to rock, large stones	Severe	Depth to rock, large stones	Severe	Depth to rock	Severe	Depth to rock, large stones
HxE	Hollis extremely rocky fine sandy loam, 15-35% slopes	Severe	Slope, Depth to rock, large stones	Severe	Slope, Depth to rock, large stones	Severe	Depth to rock	Severe	Slope, Depth to rocks, large stones
Lg	Leicester, Ridgebury and Whitman very stony fine sandy loams	Severe	Wetness, Percs slowly	Severe	Wetness	Severe	Wetness, frost action	Severe	Wetness, large stones
Po	Podunk fine sandy loam	Severe	Floods, Wetness	Severe	Floods, Wetness	Severe	Floods	Severe	Floods
SkC	Shapleigh very rocky sandy loam, 3-15% slopes	Severe	Depth to rock	Severe	Depth to rock	Severe	Depth to rock	Severe	Depth to rock
SmC	Shapleigh extremely rocky sandy loam, 3-15% slopes	Severe	Depth to rock	Severe	Depth to rock	Severe	Depth to rock	Severe	Depth to rock
SvB	Sutton fine sandy loam, 3-8% slopes	Severe	Wetness	Severe	Wetness	Moderate	Frost action	Slight	--
SxC	Sutton very stony fine sandy loam, 3-15% slopes	Severe	Wetness, Percs slowly	Severe	Wetness	Severe	Wetness, Frost action	Severe	Large stones, Wetness

MAP SYMBOL	SOIL NAME	ABSORBTION FIELDS		BUILDINGS W/ BASEMENTS		ROADS OR DRIVEWAYS		LANDSCAPING	
		RATING	REASON	RATING	REASON	RATING	REASON	RATING	REASON
Wp	Whitman stony fine sandy loam	Severe	Wetness, Percs slowly	Severe	Wetness	Severe	Wetness, Frost action	Severe	Large stones, Wetness

EXPLANATION OF RATING SYSTEM:

1. SLIGHT LIMITATION: indicates that any property of the soil affecting use of the soil is relatively unimportant and can be overcome at little expense.
2. MODERATE LIMITATION: indicates that any property of the soil affecting use can be overcome at a somewhat higher expense.
3. SEVERE LIMITATION: indicates that the use of the soil is seriously limited by hazards or restrictions that require extensive and costly measures to overcome.

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.