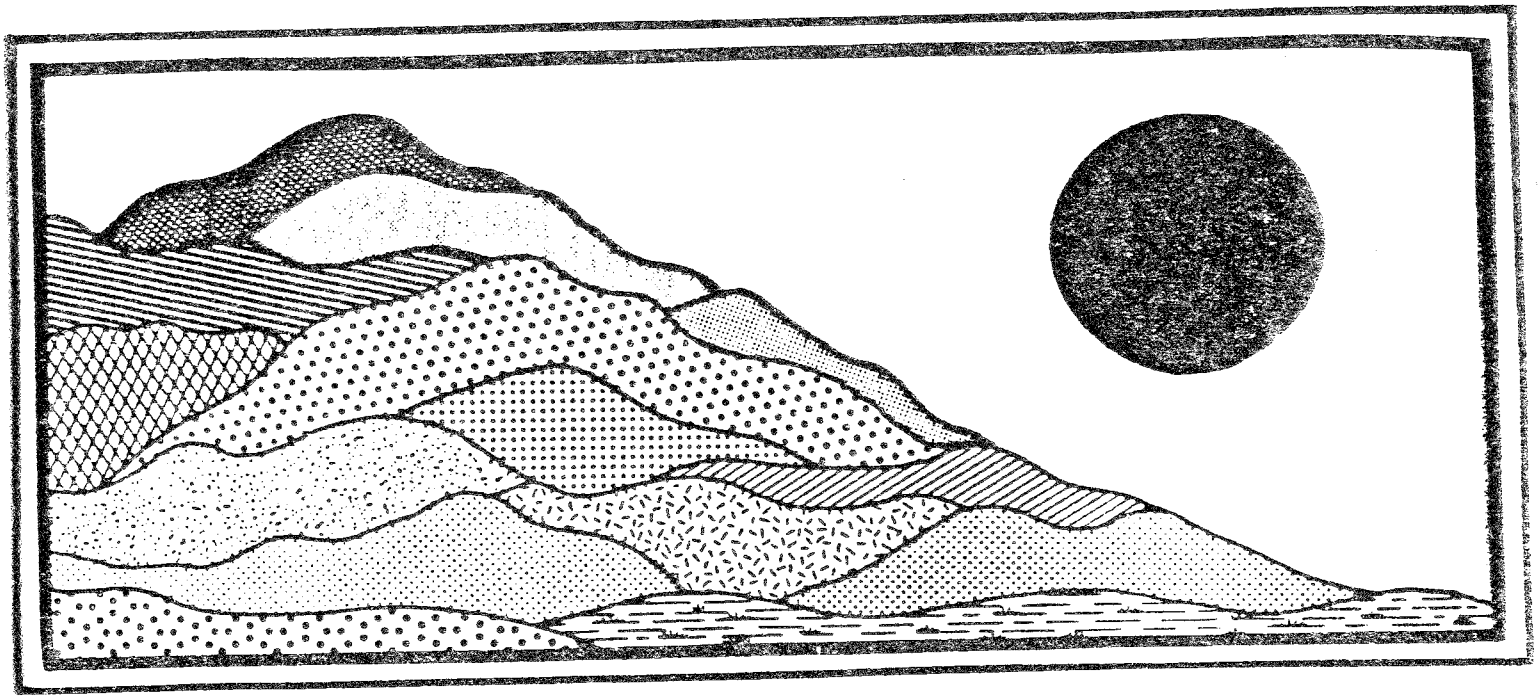
Welsh Subdivision

Brooklyn Turnpike & Pinch Street
Scotland, Connecticut

September 1985



ENVIRONMENTAL REVIEW TEAM REPORT

EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

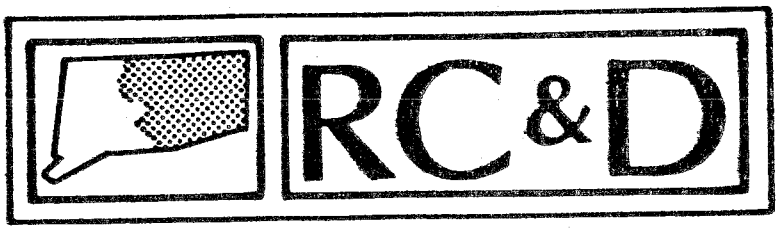
Welsh Subdivision

Brooklyn Turnpike & Pinch Street

Scotland, Connecticut

Review Date: 7/9/85

Report Date: 9/85



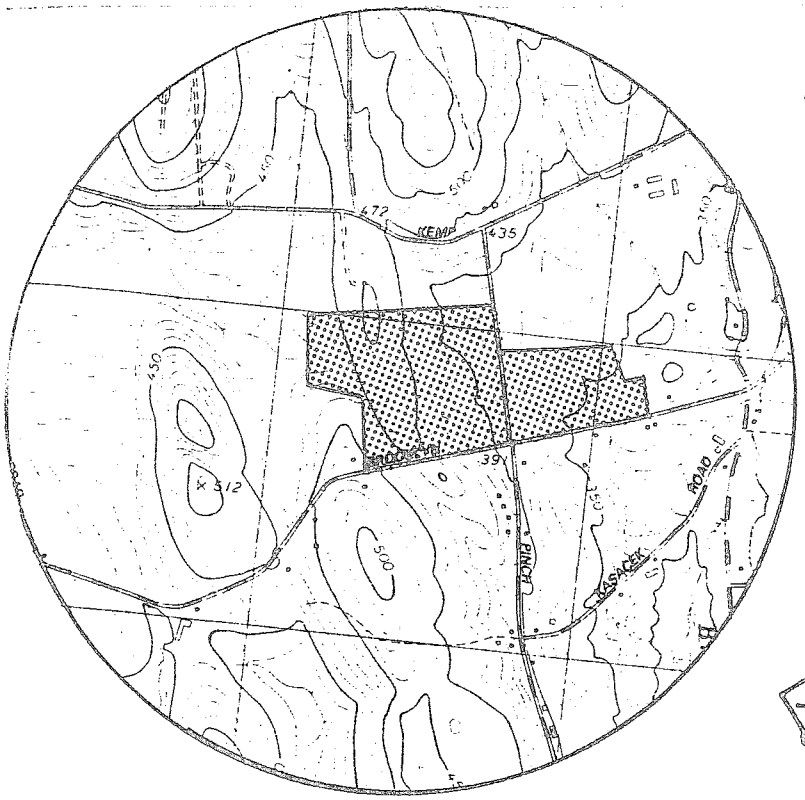
ENVIRONMENTAL REVIEW TEAM

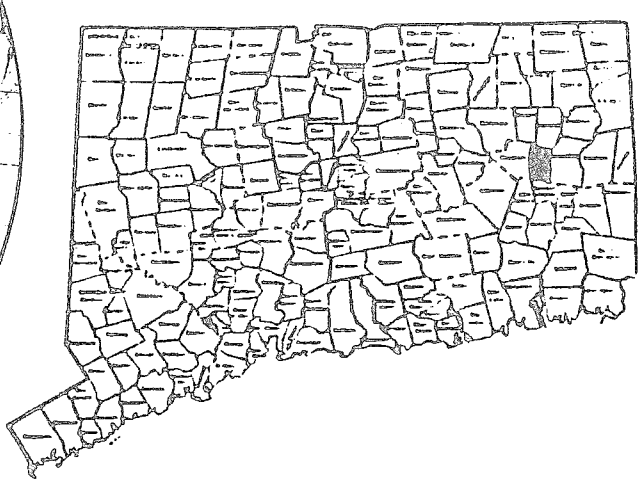
PO BOX 198

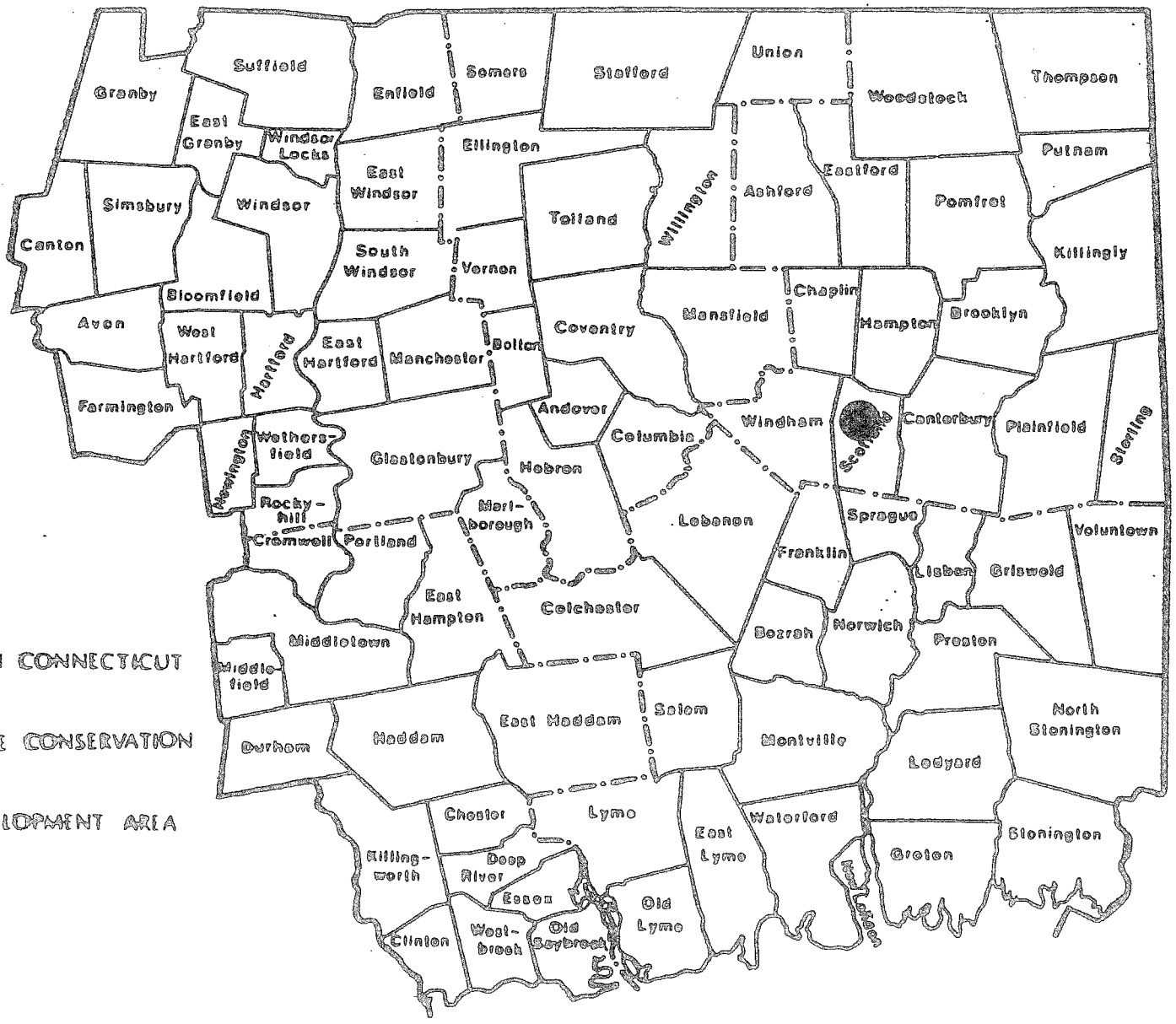
BROOKLYN, CONNECTICUT 06234

Site Location

WELSH SUBDIVISION
Brooklyn Turnpike and Pinch Street
Scotland, Connecticut







EASTERN CONNECTICUT

SOURCE CONSERVATION

DEVELOPMENT AREA

ENVIRONMENTAL REVIEW TEAM REPORT
ON
THE WELSH SUBDIVISION
BROOKLYN TURNPIKE & PINCH STREET
SCOTLAND, CONNECTICUT

This report is an outgrowth of a request from the Scotland Planning and Zoning Commission to the Windham County Soil and Water Conservation District (S&WCD). The S&WCD referred this request to the Eastern Connecticut Resource Conservation and Development (RC&D) Area Executive Committee for their consideration and approval. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

The ERT met and field checked the site on Tuesday, July 9, 1985. Team members participating on this review included:

Donald Capellaro	- Sanitarian - CT Department of Health
Howard Denslow	- District Conservationist - U.S.D.A., Soil Conservation Service
Fifi Scoufopoulos	- District Manager - U.S.D.A., Soil Conservation Service
Dick Raymond	- Forester - Department of Environmental Protection
Meg Reich	- Regional Planner - Windham Regional Planning Agency
Carol Sacknoff	- Wildlife Bureau - Department of Environmental Protection
Eric Schluntz	- Fisheries Biologist - Department of Environmental Protection
Elaine Sych	- Environmental Review Team Coordinator, Eastern CT RC&D Area
Bill Warzecha	- Geologist - DEP, Natural Resources Center
Judy Wilson	- Wildlife Biologist - Department of Environmental Protection

Prior to the review day, each team member received a summary of the proposed project, a list of the Town's concerns, a soils map and a topographic map showing the boundaries of the study site. During the field review, the team members were given site plans. The Team met with, and were accompanied by, members of the Planning and Zoning Commission, and the engineer and soil scientist for the applicant. Following the review, reports from each team member were submitted to the ERT Coordinator for compilation and editing into this final report.

This report represents the Team's findings. It is not meant to compete with private consultants by providing site designs or detailed solutions to development problems. The Team does not recommend what final action should be taken on a proposed project--all final decisions and conclusions rest with the Town and landowner. This report identifies the existing resource base and evaluates its significance to the proposed development, and also suggests considerations that should be of concern to the developer and the Town. The results of this Team action are oriented toward the development of better environmental quality and the long-term economics of land use.

The Eastern Connecticut RC&D Project Committee hopes you will find this report of value and assistance in making your decisions on this subdivision.

If you require any additional information, please contact:

Elaine A. Sych
ERT Coordinator
Eastern Connecticut RC&D Area
P.O. Box 198
Brooklyn, Connecticut 06234
(203) 774-1253

TABLE OF CONTENTS

TABLE OF MAPS

N/F MILLER

N/F RCLEAR

N/F SYME

N/F KOZLOWSKI

N/F DAVIES

N/F RYTMAN

N/F REDFIELD

OTHER LAND OF WELSH
AREA = 8.85 ACRES
385,566 SF

MAGNETIC JULY 1980

Not to Scale

LEGEND

IRON PIPE TO BE SET	⊙
IRON PIPE	○IP
DRILL HOLE	○DH
FENCE POST	○FP
STONEWALL	▬▬
WIRE FENCE	—x—x—
TEST PIT	■
BUILDING LINE	—B—
WETLAND BOUNDARY	A A

I HEREBY CERTIFY THIS MAP AND SURVEY WERE PREPARED IN ACCORDANCE WITH THE STANDARDS OF A CLASS A-2 SURVEY AS DEFINED IN THE CODE OF PRACTICE FOR STANDARDS OF ACCURACY OF SURVEYS AND MAPS ADOPTED DECEMBER 10, 1975 AS AMENDED BY THE CONN ASSOCIATION OF LAND SURVEYORS LLC

JOHN KOPKO JR LLS # 12881 — DATE

THE SUBDIVISION REGULATIONS OF THE TOWN OF SCOTLAND PLANNING AND ZONING COMMISSION ARE A PART OF THIS PLAN AND APPROVAL OF THIS PLAN IS CONTINGENT ON COMPLIANCE WITH ALL REQUIREMENTS OF SAID SUBDIVISION REGULATIONS

APPROVED BY SCOTLAND PLANNING AND ZONING COMMISSION

CHAIRMAN — DATE

MAP NOTES

1. THE PROPERTY IS ZONED RA
2. WETLANDS SHOWN HEREON WERE "BLUE FLAGGED" IN THE FIELD BY A. RICHARD SNARSKI, SOILS SCIENTIST
3. MAP REFERENCE "MAP SHOWING PARCELS TO BE CONVEYED TO ESTATE OF WELSH, SCOTLAND CONNECTICUT, 7/81, SCALE 1"=100' B. TONE ENGINEERING INC."

FINAL SUBDIVISION PLAN

PREPARED FOR

ROBERT WELSH JR

BROOKLYN TURNPIKE PINCH STREET

SCOTLAND CONNECTICUT

SCALE 1"=100 APRIL 1985

JOHN KOPKO JR & ASSOC.

OAKDALE CONNECTICUT

I. INTRODUCTION

The Eastern Connecticut Environmental Review Team was asked to prepare an environmental assessment for a proposed subdivision in the Town of Scotland. The project site is located is located on Brooklyn Turnpike and Pinch Street and consists of approximately 63 acres. The parcel would be subdivided into 26 lots ranging in size from slightly over 1 acre to 12 acres.

The subdivision plans have been prepared by John Kopko, Jr. and Associates of Oakdale, Connecticut. The property is owned by Robert Welsh. Of the 26 lots, six of the lots would be interior ones. The single family dwellings will be served by on-site wells and on-site septic systems.

The parcel is composed of open and wooded land, with approximately 10 acres being cultivated for cornfields. The topography of the site varies from moderately steep to nearly flat. There are several large areas of wetlands situated towards the west, north and east of the parcel, and a smaller, central wetland and drainage area which cuts diagonally through a portion of the property above Pinch Street.

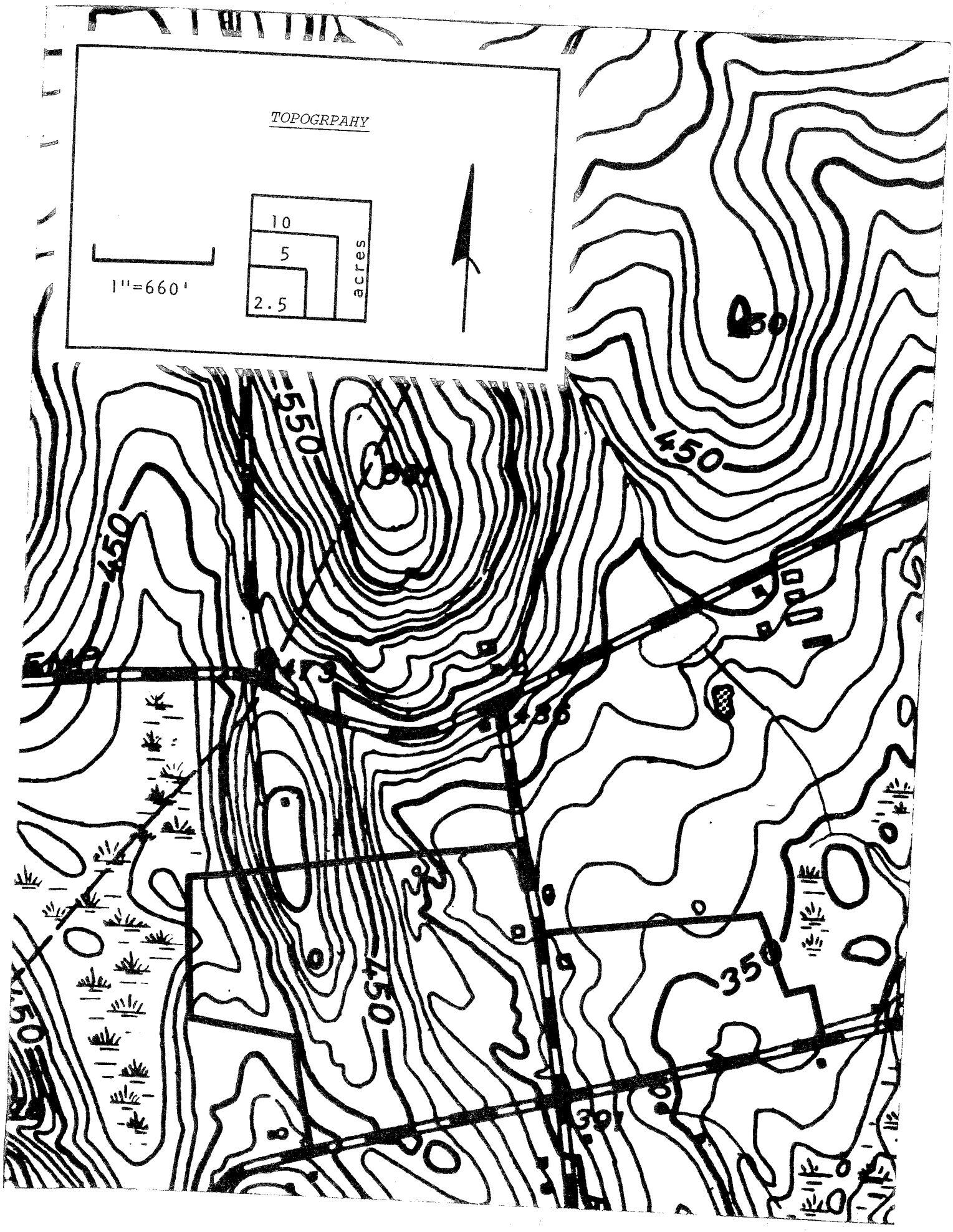
The Town is concerned with the effect that the proposed subdivision will have on the natural resource base of the site and the surrounding area. The ERT was asked to deal specifically with the impact development will have on the wetlands and drainage patterns, building suitability, water supply, sewage disposal, wildlife and vegetation disruption and land use compatability.

II. TOPOGRAPHY AND SETTING

The proposed 62.5 acre subdivision site is located in the northcentral part of Scotland. It is irregularly shaped and has frontage on Brooklyn Turnpike and Pinch Street. Present plans indicate the parcel will be subdivided into twenty-six lots ranging in size from 1.04 acres to 12.22 acres.

Most of the property is wooded. Some acreage (about 10 acres) of cultivated land for cornfields still remains along the east and west side of Pinch Street. The topography of the site is diverse and varies from moderately steep to nearly flat. The steeper slopes flank the east and west sides of the small, streamlined hill in the eastern parts. Maximum and minimum elevations on the site are about 500 feet and 340 feet above mean sea level, respectively.

No major stream courses are visible on the site. A couple of small streams flow through wetlands on lots 18-20 enroute to Merrick Brook. Another small,


TOPOGRPAHY
1"=660'
10
5
2.5
acres
550
450
450
450
350
350

intermittent stream worth mentioning on the site flows in a southeasterly direction through lots 10-13. A relatively thin band of wetland soils parallel this stream, which also ultimately flows into Merrick Brook to the east.

III. GEOLOGY

The proposed subdivision lies within the Scotland topographic quadrangle. A combined bedrock and surficial geologic map (GQ-392) by H. Roberta Dixon and Charles E. Shaw, Jr., has been published by the U.S. Geologic Survey.

Other references cited for this report include the "Soil Survey for Windham County" and soils information obtained from deep test pits excavated throughout the site.

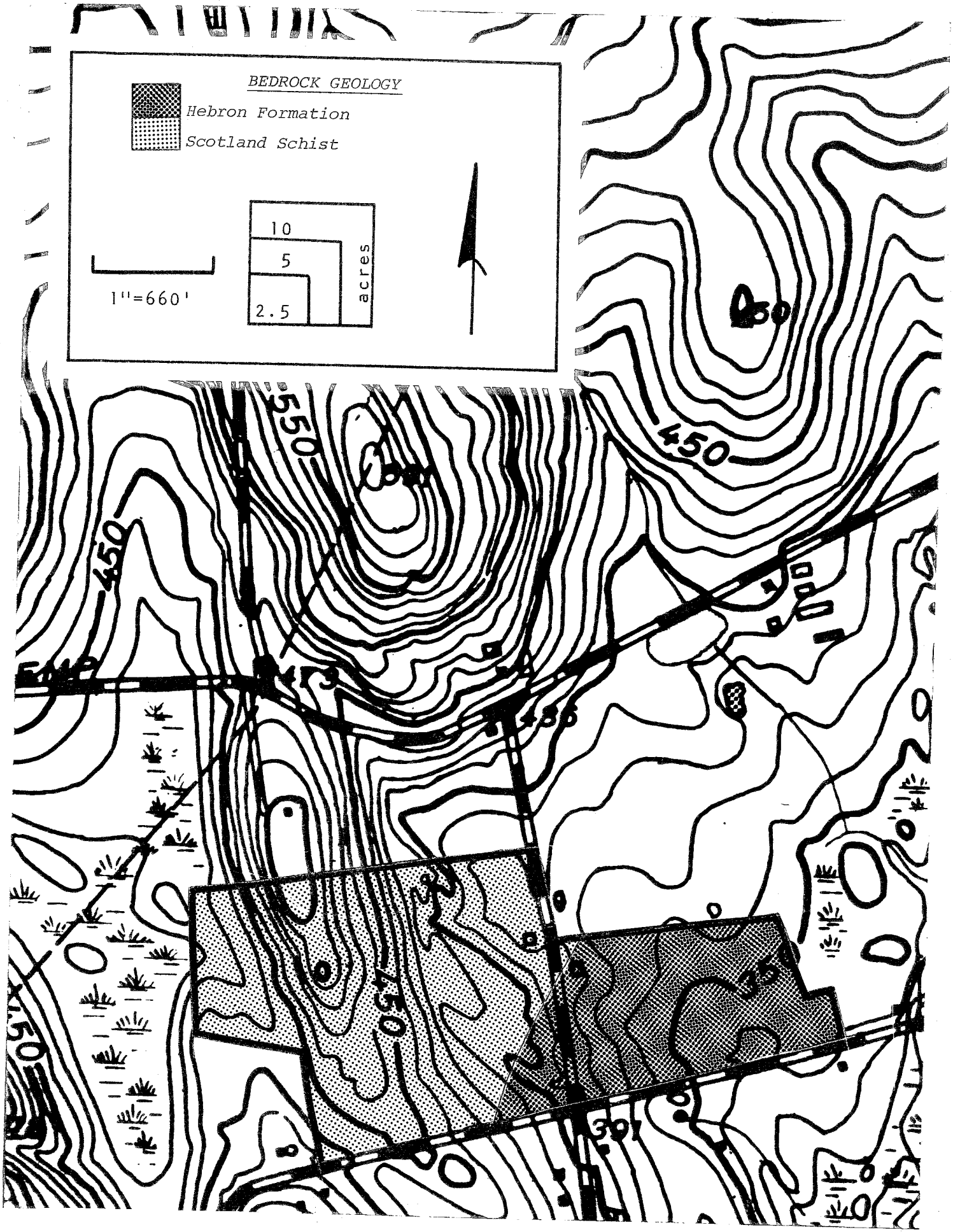
No bedrock outcrops were visible on the site during the field review. According to deep test pit information supplied by the applicant's engineer, bedrock was encountered at relatively shallow depths (about 3.5 feet to just over 6 feet) on lots 14 and 22-25. Bedrock probably does not exceed much more than 10 feet throughout the site.

Map GQ-392 classifies the bedrock underlying most of the site as Scotland Schist. The eastern parts of the site is underlain by the Hebron Formation.

The Scotland Schist formation consists of a medium-gray, fine to medium-grained schist composed mainly of the minerals quartz, biotite, and muscovite. Minor minerals in the rock includes garnet, staurolite, and feldspar. "Schist" are metamorphic (rocks geologically altered by great heat and pressure within the earth's crust) rocks in which platy minerals, i.e., muscovite and biotite, have aligned to form layers along which parting can easily occur. These rocks are also conspicuous by their wavy or crinkled surface.

The Hebron Formation consists of interlayered dark gray, medium to coarse grained schists composed mainly of the minerals feldspar, quartz and biotite and greenish-gray, fine-to-medium-grained, calc-silicate gneiss composed of labradorite, quartz, biotite, actinolite, hornblende, and diopside. "Gneisses," like the schist rocks mentioned above, are crystalline metamorphic rocks. They are recognizable by distinct banding. The banding occurs due to alternating layers of light granular minerals (quartz and feldspar) and dark platy minerals (biotite).

Overlying the bedrock is a blanket of nonsorted, nonstratified rock particles. This material is known as till and was deposited directly from glacier ice, which formerly occupied the area. The texture of the till on the site is generally loose and sandy in the upper portions (about 18"-24"). Below this depth, however, the till, commonly becomes finer-grained and more compact.


BEDROCK GEOLOGY
Hebron Formation
Scotland Schist
1"=660'
10
5
2.5
acres
550
450
450
450
450
450

As a result of this firm layer, a seasonally high groundwater table and low permeability is commonly encountered with these soils.

A sandier variety of till found in the northern and western parts of the site is delineated as GbB and GbC (Gloucester soils) on the soils map. A firm layer and slow percolation will probably not be encountered with these till-based soils. Based on visual observation during the field review, these deposits have been mined on the site probably for local fill.

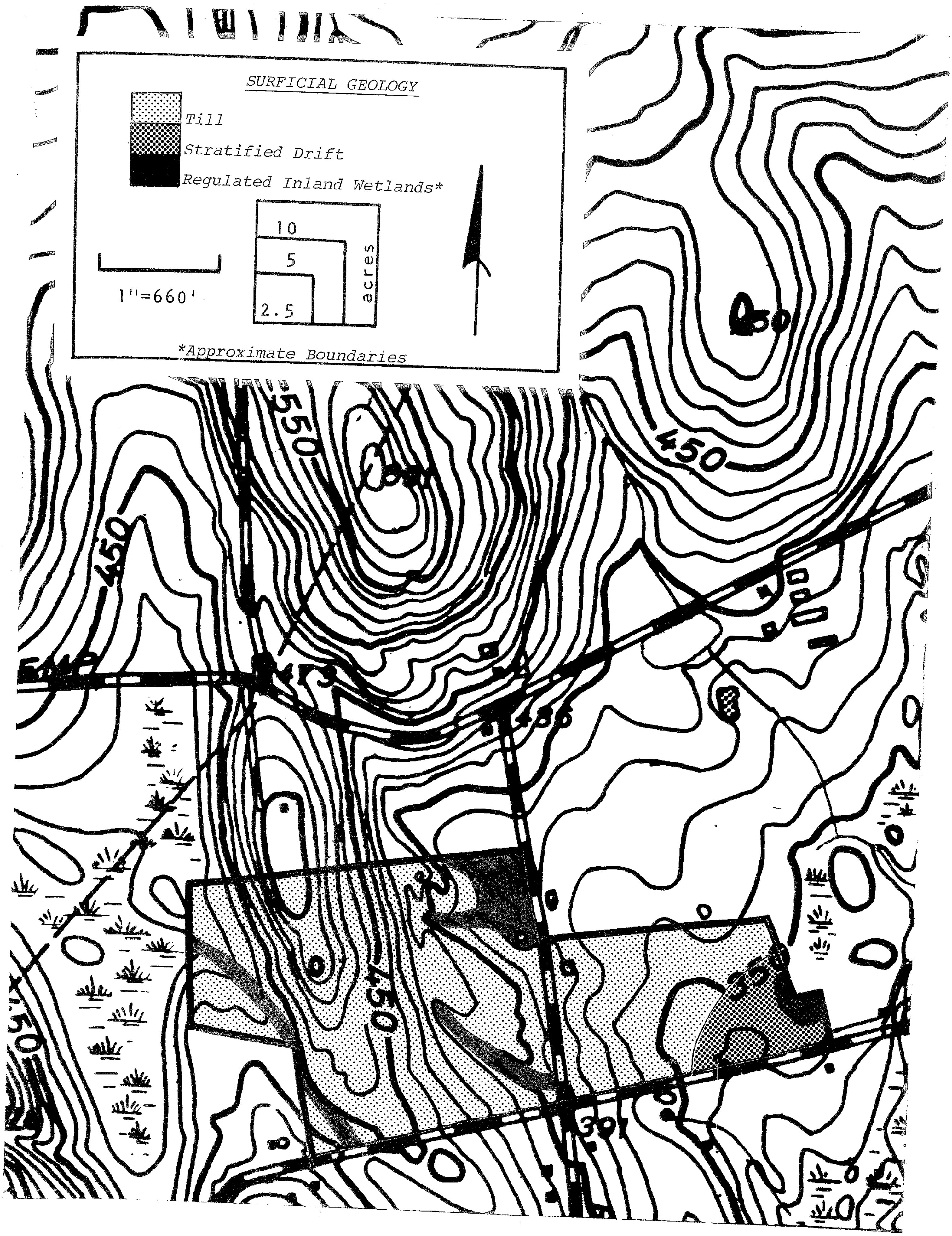
Another type of glacial deposit found on the site is stratified drift. Stratified drift consists primarily of sand and gravel. These particles were deposited by meltwater streams that issued from the wasting glacier ice. The stratified drift covering the site consists mainly of a bouldery gravel mixed with some sand to small pebbles. Stratified drift is found principally adjacent to Merrick Brook in the eastern parts, but according to the soils map, it may extend to the west side of Pinch Street. Test pit data supplied by the project engineer indicates that layers of stratified drift were encountered in this area. Thickness of the stratified drift deposits probably does not exceed much more than 10 feet on the site.

Seasonally wet areas parallel the small stream courses on the site. These soils are delineated as Rn (Ridgebury, Leicester and Whitman soils) on the soils map and are protected under Connecticut's Inland Wetland and Watercourses Act (Connecticut General Statutes Sections 22a-36 through 22a-45). Wetlands provide many important hydrologic and ecologic functions such as reducing runoff, maintaining water quality, and providing habitat for threatened and endangered species. Filling, modifying and construction on wetlands may have severe environmental impacts on the valuable functions mentioned above, and as a result, may ultimately lead to wetland destruction. Therefore, any activity which involves filling, modifying or polluting a wetland will require a permit from the Town and may be subject to public hearings.

Inland-Wetland areas hold very low potential for development and on-site septic systems, and should be avoided where possible.

IV. GEOLOGIC DEVELOPMENT CONCERNS

The major geologic hindrances to development of the site include the following: (1) the presence of a compact till-based soils, which impede the downward movement of groundwater resulting in a seasonally high groundwater table; (2) the presence of shallow to bedrock areas, which are mentioned in the GEOLOGY section; and (3) the presence of inland-wetland soils in various parts of the site. Steeper slopes in the northern areas may also be a hindrance for the construction of driveways and heavy equipment operating in these areas.


SURFICIAL GEOLOGY
Till
Stratified Drift
Regulated Inland Wetlands*
10
5
2.5
acres
1"=660'
*Approximate Boundaries
550
450
450
450

Based on soil mapping information, visual observations and deep test hole information provided by the applicants engineer, it appears many of the lots in the subdivision will require engineered septic systems. Although it may be technically possible to develop each lot in the subdivision, it seems likely that preparation of leaching areas for the majority of lots will undoubtedly be very costly, at least if all the proper engineering techniques were used to overcome the environmental limitations mentioned earlier. Also, because many lots are just over an acre in size, it may become very difficult at times to develop a particular lot using the various engineering techniques and meet all necessary requirements, such as the State Public Health Code and local regulations. This will be more of a problem for those lots which have a high percentage of inland-wetlands, shallow to bedrock areas, steep slopes, and till-based soils with a firm layer. Lot 26, which is covered nearly in half by regulated inland-wetland soils is a good example of this case. As a result, there may be a need to combine certain lots, thereby reducing the overall number of lots in the subdivision to make available a suitable area for installation of septic systems, on-site wells, and drain, if necessary, and construction of the house. Based on deep test pit information supplied by the project engineer, many of the leaching systems may also need to be protected by a groundwater intercepting drains (curtain drains) and possibly proper fill material in order to assure proper installation and protection of groundwater.

The Town will need to rely on its sanitarian to carefully evaluate the surface and subsurface conditions on each and every lot to determine whether or not it can support a sewage disposal system, well, and house and meet all of the various code requirements.

It should be pointed out that a prospective buyer of a particular lot in the subdivision may wish to locate a house in a different area than what is presently shown on the subdivision plan. As a result, it may be necessary to re-test the desired area on the lot to determine subsurface conditions before a permit can be issued for the septic system serving that lot.

It is most important that once engineered septic systems have been finally approved by proper authorities (local and state health departments) that the septic system be carefully installed by a licensed contractor familiar with septic system installation, inspected by the Town sanitarian according to the approved plan and properly maintained by the homeowner, i.e., pumped on a regular basis, every 3-5 years, for continued successful operation.

Another concern raised by Town officials on the review day is the need of the developer to cross wetland areas with access drives in the northern and western parts. Based on the site plan submitted to team members on the review day, it appears that wetland areas will be crossed in order to provide access to lots 18-20 and lots 1 and 2. Additional crossings of wetland soils by driveways may also be requested, depending on desired house locations.

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 and 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.

If zoning requirements permit, perhaps consideration could be given to developing a cluster of homes in the northern parts of subdivision. The relatively gently sloping, rear portions of lots 17-20 might accommodate such an area for homes. Access to these clustered homes might be provided by the frontage on lot 17 off Pinch Street. If this "alternative" is possible, the need to cross the wetlands on lots 18-20 would be eliminated. Perhaps something similar might also be accomplished for lots 1 and 2.

Prior to filling or modifying wetlands areas, all plans should first be submitted to town officials and commissions for their approval. Also, all necessary permits should be secured by the developer before any work is started in wetland areas.

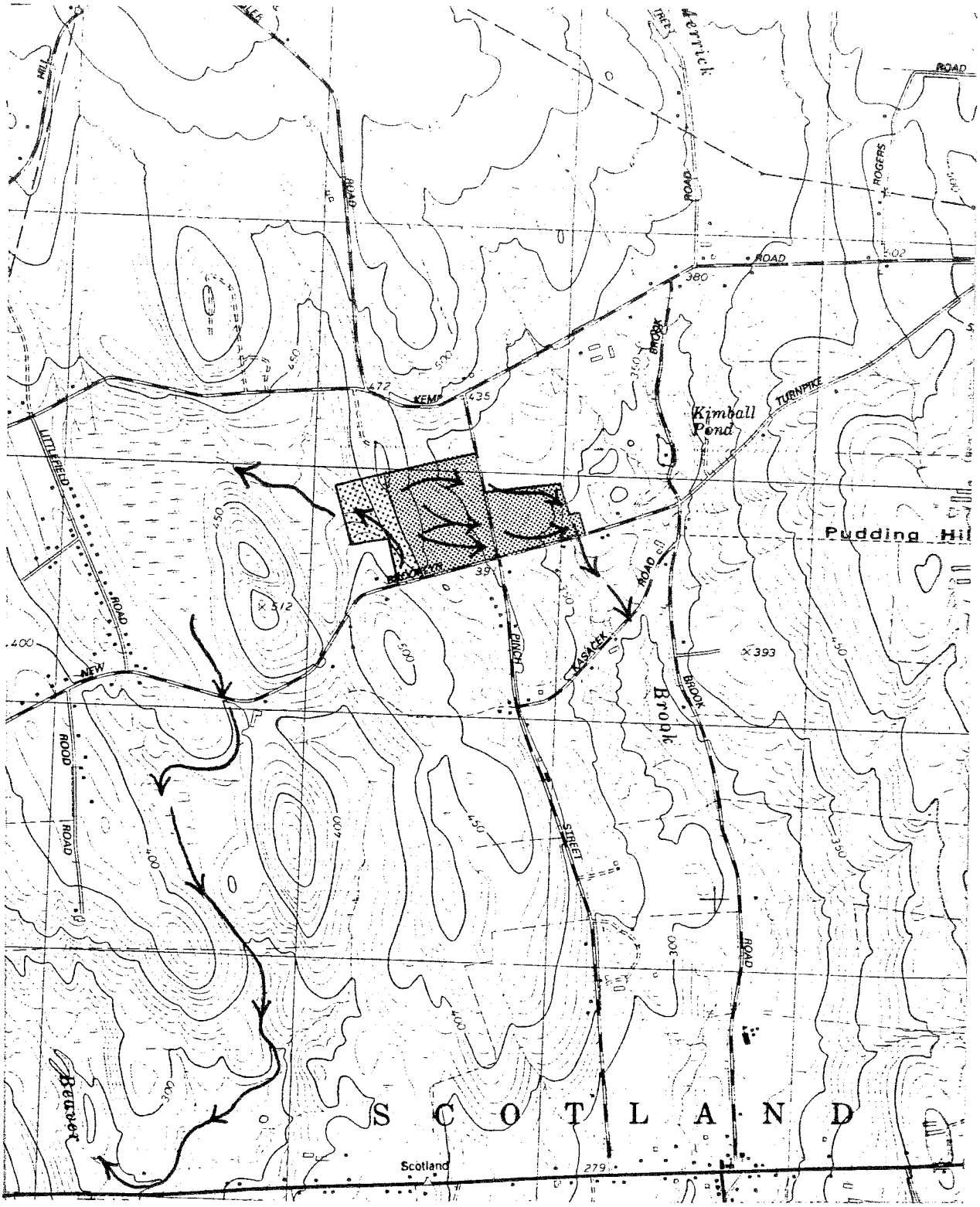
Where feasible, it is recommended that building footing drains be installed around homes. This should hopefully minimize the chances of wet basements.

V. HYDROLOGY

With the exception of about 19 acres in the western part of the subdivision, surface and groundwater on the site flows generally eastward towards Pinch Street. Surface runoff from the central parts of the site is routed through a series of four culverts under Pinch Street and ultimately discharges to an unnamed, intermittent stream, which is tributary to Merrick Brook. Merrick Brook eventually empties into the Shetucket River.

Surface runoff and groundwater in the western limits of the site, which includes lots 1, 2 and part of 3 flows westward toward a topographic swale. The topographic swale acts as a discharge area for surface water and groundwater. Water is then routed to a large wetland area west of the site. The outlet stream for this wetland is tributary to Beaver Brook.

Development as planned will probably cause at least some increases in the amount of runoff from the site. The subdivision plan, by itself, was not sufficient to allow the determination of the runoff change likely to occur. The increases will arise from the construction of impermeable surfaces, such as roof tops and paved driveways/roads, over formerly permeable areas, the compaction of soils and the removal of trees and other natural vegetation. However, because the subdivision, under natural conditions, can be divided into at least three subdrainage areas and because proposed development in



DRAINAGE AREA

Site area which drains to Merrick Brook

Site area which drains to Beaver Brook

Watercourses showing direction of flow

Scale 1"=2000'

each of the subdrainage areas will be low, it is anticipated that runoff increases on flood flows should be very minor. In addition, it is not likely that other development could occur in these drainage areas since most of the remaining land is part of the property.

Nearly fifty percent of the subdivision (lots 4-16) under the present plan, appear to drain to a culvert passing under Pinch Street, slightly north of its intersection with Brooklyn Turnpike. It should be pointed out that much of the land in this subdrainage area comprises cultivated farmland. Cultivated farmland (bare-soil) will generate a higher volume of runoff during a certain storm event than land which is forested or which at least has a vegetative cover. Therefore, it is expected that runoff volumes following development in these areas would decrease once lawns have been established on the land presently under cultivation.

The increases in runoff and ultimately peak flows for specific water courses will depend upon the layout of artificial drainage channels, roads/driveways and other manmade features. Therefore, it is recommended that a stormwater management plan be included with the final subdivision plan. Also, as a precautionary measure, the project engineer should take a close look at all affected downstream culverts, as part of the stormwater management plan.

Another water related concern discussed on the review day, is an existing topographic swale bisecting lot 10. It appears that this swale plays some role in draining the wetland area on lots 11 and 13. Obstruction of the swale by filling or some other type of modification, i.e., diversion, etc., may lead to potential flooding problems elsewhere on lot 10. Therefore, it is recommended that this drainway not be disturbed in any manner unless it can be proven by a qualified engineer/hydrologist that modification will not cause any flooding problems. Perhaps consideration should be given to incorporating something into the finally approved subdivision plan or deed for lot 10 regarding this matter.

Wetland areas on lots 18-20, lots 1 and 2 and the wetlands east of lots 21-26 should be avoided since they will provide some hydrological values such as flood storage and also have ecological benefits.

VI. WATER SUPPLY

On-site water supply wells have been proposed to serve the subdivision. Bedrock appears to be the only suitable aquifer for such wells in the area. Water is supplied to bedrock-floored wells chiefly through fractures in the rock. Because of the uneven distribution of the fractures, it is very difficult to predict the potential yield from any new well. A yield of at least 3 gpm (gallons per minute) is desirable and is adequate for most household needs. In a survey of 134 bedrock wells in the Shetucket River basin, it was found that

90 percent of the wells provided 3 gpm or more. Few wells supplied 50 gpm or more (source: Connecticut Water Resources Bulletin No. 11).

In general, wells should be located at the high side of lots probably separated from sewage disposal systems or other potential sources of pollution such as buried fuel oil tanks. They must also be properly separated from watercourses or drains and be protected from surface drainage and erosion.

Properly drilled and sealed deep wells will generally afford the most protection against possible sources of pollution and have the most reliable yield, particularly during seasonal or prolonged dry periods. Of course, as there is always a possibility of very low yield or problems of insufficient supply, it is possible and prudent to have the well installed prior to the time of actual house construction. Increasing the depth of wells and/or by providing larger storage tank facilities are means by which low yielding wells can often be made to operate satisfactorily during peak demand or usage periods.

Both the Scotland Schist and Hebron Formation underlying the site contain iron-bearing minerals, i.e., garnet, staurolite, opaque minerals, etc., that may taint local well water. Hence, water from any new wells should be analyzed for chemical problems and, if necessary, appropriate filtration measures taken.

Because some of the field areas are being used for corn growing, heavily fertilized agricultural acreage can be a source of nitrates in water. In general, the maximum level for nitrate in drinking water should not exceed 10 ppm. This level would be of particular concern for infants, rather than older children or adults, who might be subject to consuming water of such quality.

VII. SEWAGE DISPOSAL

As the small and rural town of Scotland does not have a municipal sewerage system, the development would be served by individual on-site subsurface sewage disposal systems.

Based on visual observations, soil mapping data and review of the engineer's soil test results, it is apparent that the parcel is not especially favorable for on-site sewage disposal. The main factor is a seasonal high groundwater level over much of the property. This perched water condition is apparently caused by a relatively shallow compact or hardpan layer which has slow seepage or permeability, restricting the downward movement of water. Percolation tests generally indicate seepage rates in the range of 1 inch in 10-20 minutes, although the hardpan layer itself will likely have some variations in its restrictiveness. In a few lots relatively shallow ledge rock was encountered.

For the most part, conditions will warrant detailed engineered design for sewage disposal systems. Groundwater can probably be controlled by the

use of curtain and footing drains and proper surface grading and drainage. Some filling in order to elevate leaching systems sufficiently above the hardpan layer and/or maximum groundwater level will also be needed to prevent interference with dispersal and sewage effluent. As a general rule, leaching systems should be kept large, shallow, in better soil, and spread out along the contour or slope as much as possible to facilitate the lateral dispersal of effluent. Because of slope and runoff, steps to minimize erosion during and after construction should also be implemented.

Although lot sizes are relatively large, several of the proposed lots in the subdivision on Brooklyn Turnpike and Pinch Street, are restricted as to usable land area by the presence of considerable wetlands (lots 18, 19 and 26). In order to allow more suitable area and better spacing for facilities with less disturbing of or impact on natural conditions consideration should be given to possible combining a few of these lots in order to have larger and more satisfactory ones.

There is no doubt that the proposed subdivision will require close supervision and inspection during actual construction in order to assure satisfactory conditions and proper water and sanitary facilities.

VIII. SOILS

A. BRIEF DESCRIPTION

The soils in the upper portion of the area, west of Pinch Street are largely derived from glacial till and lie on the east side of a glacial drumlin. Soils lower, generally east of Pinch Street are sandy, excessively drained, and developed from glacial outwash associated with Merrick Brook drainage pattern. The proposed subdivision encompasses a transition zone of upland soils into terrace and alluvial soils. A soils map developed from the Windham County Soil Survey is within this report, as is a Principal Limitations chart, and descriptions of the soils. (See Appendix)

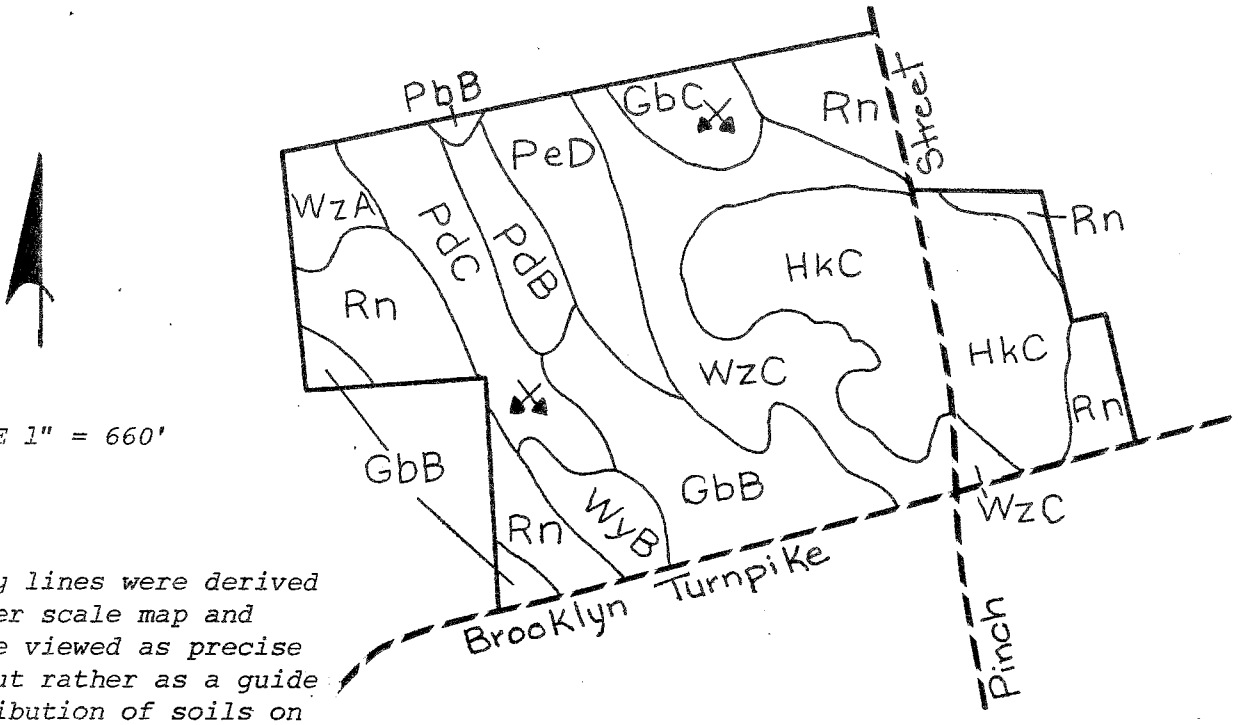
Wetlands designated by specific soils found on site have been flagged in the field and are shown on the site development plan. Delineations are shown in more detail than on the Soil Survey Map simply due to scale. Decisions on lot use, location of driveways, houses, septic systems, etc. should be made based on the site development plan and wetlands there shown.

B. RESOURCE CONCERNS

The main natural resource limitations to development are with wetland soils, storm drainage and erosive soils where the cropland is present.

United States Department of Agriculture
Soil Conservation Service
Agricultural Center
Brooklyn, CT 06234-0327
774-0224

Assisting the Windham County Soil and Water Conservation District



SCALE 1" = 660'

Soil boundary lines were derived from a smaller scale map and should not be viewed as precise boundaries but rather as a guide to the distribution of soils on the property.

S O I L S

GbB-Gloucester very stony fine sandy loam, 3 to 8 percent slopes.

GbC-Gloucester very stony fine sandy loam, 8 to 15 percent slopes.

HkC-Hinckley gravelly sandy loam, 3 to 15 percent slopes.

PdB-Paxton very stony fine sandy loam, 3 to 8 percent slopes.

PdC-Paxton very stony fine sandy loam, 8 to 15 percent slopes.

PeD-Paxton extremely stony fine sandy loam, 15 to 35 percent slopes.

**Rn-Ridgebury, Leicester & Whitman extremely stony fine sandy loams.*

WyB-Woodbridge very stony fine sandy loam, 3 to 8 percent slopes.

WzA-Woodbridge extremely stony fine sand- loam, 0 to 3 percent slopes.

WzC-Woodbridge extremely stony fine sandy loam, 3 to 15 percent slopes.

**Designated wetland soil by Public Act 155*

The development plan shows access to lots 1, 2, 18, 19, and 20, by crossing wetlands. Since crossing wetlands can require substantial gravel fill and/or installing a culvert there is obvious wetlands disturbance. It is recommended that crossings be minimized by either combining access drives (lots 1 and 2/19 and 20), or by moving lot boundaries. Eliminating lot 3 and using it for a ROW to lots 1 and 2 is possible. Where driveways cross wetlands with drainage a culvert size should be determined. Amounts of fill, placement, and final grading, as well as stabilization of side slopes (i.e., grassed, hay mulch, or woodchips, etc.) should be shown on the site plan.

Attention to storm drainage across lot 10 and through a culvert under the drive porposed for lot 11 is important. There should be a right-to-drain easement across lot 10. Either a pipe or open waterway needs to convey runoff across this lot. It may be possible to move the existing swale to parallel the lot boundaries to allow better use of the lot.

The site development plan calls for a diversion swale between lots 24 and 25 and 25 and 23. An alternative would be to pipe the uphill runoff under the front of lots 25 and 26, beginning the pipe near the road in the present wooded swale. If the swale is constructed as shown, the town needs an easement to be sure the swale is always kept clean and unblocked. Otherwise lots 25 and 26 could suffer. Either swale or piping needs to be designed to carry the storm drainage from the 24 inch dia. road culvert. A swale will probably need to be stone centered to carry the high velocity runoff without gutting-out. Design and installation drawings should be on the site plan.

An Erosion and Sediment Control Plan (ESC) showing treatment (measures) to be used on a lot when it is developed should be part of the site development plan. The requirements of such plan are found in the state Guidelines on Erosion and Sediment Control prepared by the Connecticut Council on Soil and Water Conservation. Basically, measures to control erosion temporarily during construction (like silt fence or haybales) and permanently after development (like seedings to stabilize driveway fill banks, cut slopes, the swale, etc.) need to be shown and written about. It is suggested the Scotland Planning and Zoning Commission evaluate the ESC in terms of needed control and being able to measure compliance with a plan on the developing site. The Commission may want to require detailed ESC measures for a certain number of lots that are to be built upon first. Builders on remaining lots might be required to submit an ESC plan for each lot before development.

Where cropland is present a good winter rye cover should be used to prevent erosion due to slope. When and if the fields are taken from a farmer's use, a rye cover or at least temporary other seeding should be on the field.

One other concern is noteworthy. The "Other land of Welch" 8.85 ACS. not now proposed as a building lot is largely wetland. A fifty foot ROW between lots 21 and 22 has been left off of Pinch Street to get to this parcel. Careful evaluation of this area would be needed to see if there is any chance of building on it.

IX. VEGETATION

This parcel may be divided into five major vegetation types. Included are mixed hardwoods which total 31.4 acres, hardwood swamp/streambelt of 13.3 acres, 1.1 acres each of old field and open swamp and 15.6 acres of agricultural fields.

A. VEGETATION TYPE DESCRIPTIONS

Type A (Mixed Hardwoods). Fair quality pole and sawtimber size red oak, black oak, scarlet oak, white oak, red maple, hickory and black birch are present in the overstory of this fully stocked 26.3 acre stand. Sapling size red maple, beech, black birch, white ash and hickory along with highbush blueberry, hazelnut, raspberry, blackberry and spicebush form the understory. Scattered apple and red cedar occur along Brooklyn Turnpike. Ground cover consists of ferns, grasses and mosses. Openings created by harvesting operations within the past 10 years have become adequately stocked with desirable hardwood seedlings.

Type B (Hardwood Swamp/Streambeld). Poor to fair quality pole to sawtimber-sized red maple, white ash, yellow birch and black oak occur in this 13.3 acre overstocked stand. An understory of hardwood tree seedlings and saplings, spicebush, sweet pepperbush and swamp azalea is present. Ground cover consists of mosses, ferns, bracken and skunk cabbage.

Type C (Mixed Hardwoods). This 5.1 acre fully stocked stand contains an overstory of pole to sawtimber-size red maple, sugar maple, black oak, cherry, butternut and hickory. An understory of hardwood tree seedlings and spicebush exists. Grasses and ferns form the ground cover.

Type D (Old Field). Occupying 1.1 acres, this stand is variably stocked with sapling-size aspen, red cedar, red maple and cherry. Highbush blueberry, huckleberry and bayberry are also present. The ground cover is formed by ferns, grasses, goldenrod and hardwood seedlings.

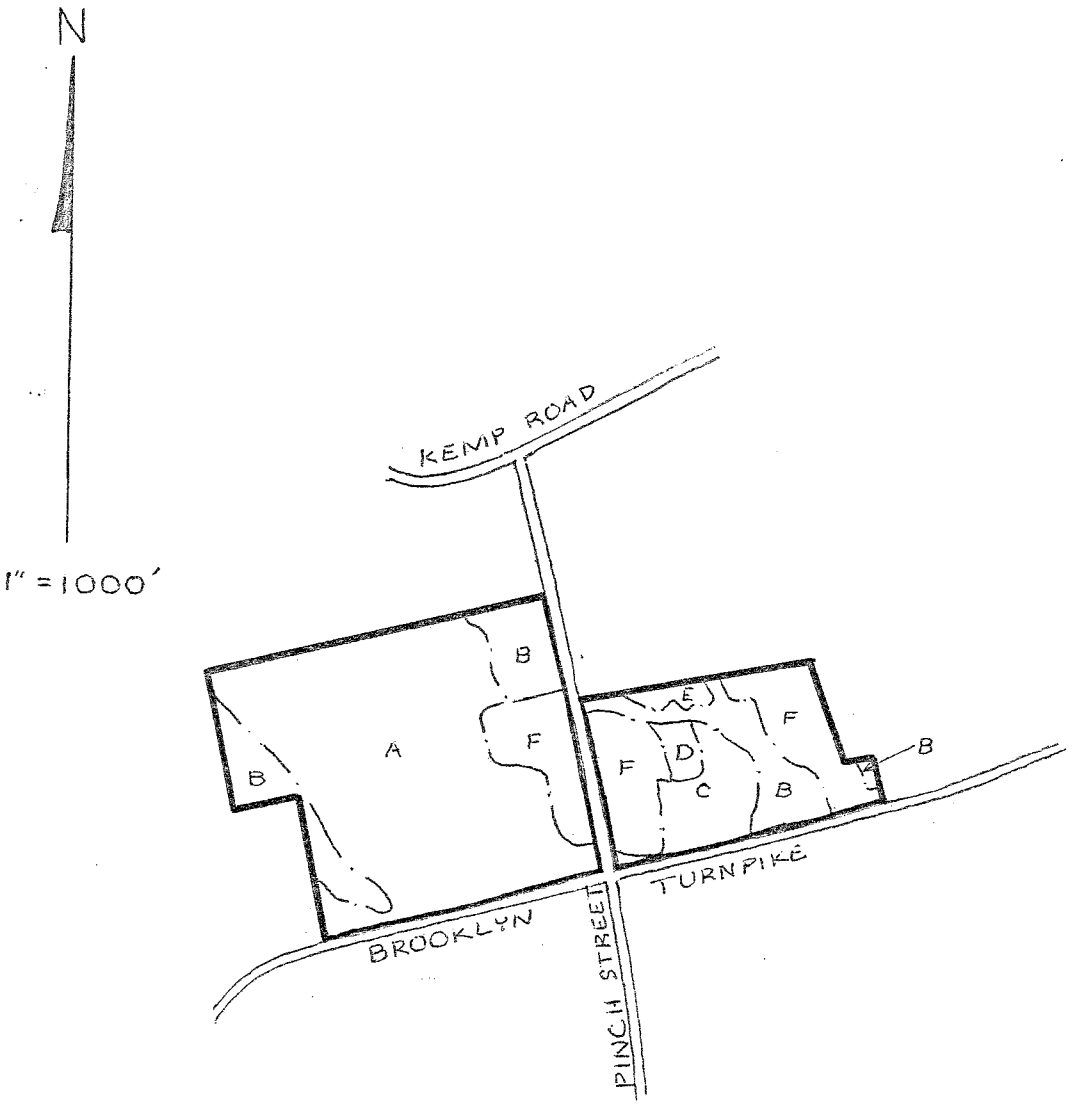
Type E (Open Swamp). This 1.1 acre meadow is comprised of sedges, grasses, flag, bracken and goldenrod. Multiflora rose, highbush cranberry, alder and willow together with seedling to sapling-size red maple and elm are beginning to invade the meadow.

Type F (Agricultural Field). Actively used fields occupy 15.6 acres.

B. MANAGEMENT CONSIDERATIONS

Areas of Vegetation Type A remaining as woodland after construction should be regenerated by the group tree selection system, because while the stand is fully stocked, stocking of desirable trees is below acceptable levels. Under the group tree selection system, new regeneration becomes established under the protection of the residual stand during periodic partial cuttings while

VEGETATION
SCOTLAND SUBDIVISION



VEGETATION TYPE DESCRIPTIONS:

Type A: Mixed hardwoods, 26.3 acres, fully stocked pole to sawtimber size

Type B: Hardwood swamp/streambelt, 13.3 acres, overstocked pole to sawtimber size

Type C: Mixed hardwoods, 5.1 acres, fully stocked pole to sawtimber size

Type D: Old field, 1.1 acres, variably stocked, sapling size

Type E: Open swamp, 1.1 acres, some seedling to sapling size

Type F: Agricultural field

LEGEND

PROPERTY BOUNDARY

TYPE CHANGE

ROAD

Seedling size: Trees less than 1 inch in DBH

Sapling size: Trees 1 to 5 inches in DBH

Pole size: Trees 5 to 11 inches in DBH

Sawtimber size: Trees 11 inches DBH and up

the stand retains some larger old trees. Within 10 years, approximately 1/5 of the larger trees should be removed in small groups. Ideally, under this system, a small percentage of the stand should be harvested every 10 years.

Vegetation Type B could be lightly thinned by removing 1/5 of the total fuelwood volume. The black oak, yellow birch and white ash should be favored for the residual stand. Care should be taken not to create any large openings in the crown canopy.

To avoid irreversible soil damage, thinning operations in the hardwood swamp/streambelt should be implemented during the winter months when the ground is frozen or the summer months when the ground is dry.

Vegetation Type C should be left as is and re-evaluated in 10 years.

Vegetation Type D could be left as is or reinforced by planting conifers such as white pine, larch or Norway spruce on a random spacing.

A public service forester or private consultant forester should be contacted to select specific areas for harvest and to offer specific planting advice. Revenue from the harvest will more than cover the consultant costs.

C. MITIGATING MEASURES

Trees are very sensitive to the condition of the soil within the entire area under their crowns. Development practice near trees, such as excavating, filling and grading for construction of roadways and buildings may disturb the balance between soil aeration, soil mixture and soil composition. These disturbances may cause a decline in tree health and vigor, potentially resulting in tree mortality within three to five years. Mechanical injury to trees may cause the same results. Dead trees reduce the aesthetic quality of an area and may become hazardous and expensive to remove if near roadways, buildings or utility lines.

Care should be taken during the construction period not to disturb the trees that are to be retained. In general, healthy and vigorous trees should be retained as they are more resistant to the environmental stresses brought about by construction.

Where feasible, trees should be saved in small groups or "islands." This practice lowers the possibility of soil disturbance and mechanical injury. Individual trees and "islands" of trees should be temporarily, but clearly, marked so that they may be avoided during construction.

The poorly drained soils present within the Hardwood Swamp Type limit the vegetative growth to species that are able to tolerate high moisture conditions. The red maple, white ash and American elm are able to tolerate the present site conditions, however, any adverse change in the drainage conditions could change the species composition of the area.

The loss of trees due to windthrow is a potential hazard in the Hardwood Swamp Type. The soil is saturated with water for the greater part of the year causing soil aeration to be poor. These conditions result in unstable, shallow root systems which are unable to securely anchor the trees. The potential for windthrow is intensified by the crowded condition in the hardwood swamp.

It should be noted that any clearings made in or around this area will increase the windthrow hazard by allowing the wind to pass through rather than over this area. If possible, any clearing of vegetation in this type should be kept to a minimum.

X. WILDLIFE HABITAT

A. CONSIDERATIONS

Wetlands cover a portion of the proposed project site. Wetlands are absolutely essential areas for many species of wildlife and important to all because they provide habitat requirements needed for survival.

Not only are they important to wildlife they are important to man also. They act as water storage and absorption areas that help prevent flooding. There is usually severe inherent limitations in developing wetlands due to poorly drained unstable soil types.

Wetland habitat provides a rich variety of food, cover, nesting and brood rearing sites for a great number of wildlife species. They provide breeding and nesting sites for waterfowl, and habitat for more than 50 species of game and non-game species including beaver, bobcat, fox, mink, muskrat, opossum, white-tailed deer, and snowshoe hare. Because of previous development there is less wetlands available for use by wildlife. Developing any small area by building on it will leave the majority of the area unavailable for wildlife to use.

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

Some species which require larger undeveloped areas will probably be forced out or will reduce their use of the area. They may be able to move into adjacent undeveloped areas if there is suitable habitat available and the competition with other species already occupying the area is not too great.

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

B. RECOMMENDATIONS

If carried out, the following wildlife recommendations can help lessen the impact to some species using the area. Some animals will leave the area but others may find it even more attractive after development.

1) Design of Development/Wetlands

The impact on wildlife of the area can be lessened to some degree if some thought is given to the development. Housing developments can be designed in two basic wyas. Houses can be built on larger house lots or they can be built on small lots or in clusters, leaving open space areas. Both designs leave more open space for wildlife as opposed to having small lots and developing the entire acreage.

Probably none of the wetland areas should be developed due to the severe limitations caused by soil capabilities and the regulations governing their development. They are important to wildlife as feeding, nesting and cover areas.

A buffer area of uncut vegetation should be left along the entire length of the watercourse. This will provide food, cover and nesting sites for many species. Because the brook will remain shaded, water temperatures will not rise, making the brook uninhabitable for some species.

2) Clearing

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

white oak (Quercus albra)
red oak (Quercus rubra)
black cherry (Prunus serotina)
quaking aspen (Populus tremuloides)
red-osier dogwood (Cornus stolonifera)
apple (Malus spp.)

3) Landscaping

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

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

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

Japanese barberry (Bergeris bulgaris)
flowering dogwood (Cornus florida)
honeysuckle (Lonicera spp.)
juniper (Juniperus spp.)
bayberry (Myrica pensylvanica)
chokecherry (Prunus virginiana)
American holly (Ilex opaca)
maple-leaved birburnum (Biburnum acerifolium)
American mountain ash (Sorbus americana)
autumn olive (Elaegnus umbellata)
winterberry (Ilex verticillata)
American cranberrybush (Veburnum trilobum)
red maple (Acer rubrum)
red-osier dogwood (Cornus stolonifera)
alternate leaf dogwood (Cornus stolonifera)

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

XI. FISHERIES HABITAT

The proposed subidivision contains an intermittent stream supporting brook trout and blacknose dace populations. Few fish inhabit this stretch of stream during low summer flows due to the absence of deep pools. Immediately downstream from the proposed subdivision the stream supports good numbers of brook trout. The removal of trees along the stream would allow more sunlight to reach the stream causing an increase in water temperature and a decline in the brook trout population. The impact of development on the stream can be minimized by (1) leaving a 100 foot wide buffer zone, and (2) by taking adequate erosion and siltation control measures along the stream.

The fisheries resources to be impacted by the proposed subdivision is limited. Implementation of the above stated measures will help to preserve downstream fish habitat and populations.

XII. PLANNING CONCERNS

A. RELATIONSHIP TO PLANS

1) State Plan of Conservation & Development

The State of Connecticut Conservation and Development Policies Plan, 1982-1985, recommends this area for use as a Conservation Area where prime agricultural land operations/soils exist, and for a Rural area elsewhere in this parcel. This plan serves as a policy framework for State government planning

and capital investment decisions.

Policies pertaining to these areas include:

Conservation Area -- Prime agricultural lands should be maintained for food production to the maximum extent feasible by:

a. minimizing development pressure in the placement and design of major facilities.

b. permitting irreversible conversion to other uses only when there is a demonstrated overriding need, alternative sites are not technically feasible or economically justified and the impact of irreversible conversion is weighed.

Rural Areas --

A. Community Environmental Quality

Encourage the protection of natural resource characteristics and the consideration of environemntal quality in State actions.

1. Encourage and assist municipalities in the use of soils, geologic surveys and other natural resource information, basin and streamblet planning techniques in developing community plans.

2. Discourage non-agricultural development on prime farmlands.

B. Economic and Human Resource Development

Limit State support and promotion of the development to those uses and densities that ensure indefinite functioning of on-lot water supply and waste disposal systems and that are consistent with a generally open, rural environment.

1. Encourage municipalities to improve their management and regulation of new development to assure compatibility with Plan policies.

2. Respond to housing needs in Rural areas through financial assistance to individual households. Where new large-scale developments are requaired, these projects should be encouraged in Rural Community Centers.

3. Expand the scientific management of forest lands and support forest product industries.

4. Identify forms of assistance required to continue farming.

C. Public Service and Infrastructures

Minimize the need for costly urban infrastructure facilities.

1. Encourage development regulations which will preclude the need for sewer, water and other urban infrastructure and facilities and which promote intertown or regional approaches where appropriate when needed.

2. Establish guidelines for the control of the number and location of access points along rural State high ays to maintain traffic volume capacity and safety standards.

3. Undertake traffic flow improvements to existing highways as a preferred alternative to the construction of new highways.

4. In general, locate interstate highway interchanges in urban rather than rural areas to support the concentration of urban gorwth in those areas.

2) Regional Plan

The Windham Region Growth and Preservation Guide Plan (1981) recommends this area for Low Density Rural types of land uses. Policies which apply in this area are as follows:

. Development incentives should be provided to encourage residential development on internal parcels of land rather than along existing road frontages. Not only will the rural appearance of the region be maintained but traffic flow will be enhanced and traffic accidents reduced through having two or more residences on a single driveway instead of each individual residence having a driveway entering a state highway or town road.

. Preservation of agricultural lands and operations should be encouraged.

. Two-acre building lots should be the minimum and the prevailing lot size.

. Public services such as sewer, water and trash collection should not be available in the district.

. Large residential development projects should be discouraged in the low-density rural district. However, if such development occurs, subdivision standards for such developments should be designed to place all possible burdens for serving the residents of the proposed development on the developer (e.g. roads which at least meet town road specifications, drainage, dedication of land for recreation and perhaps additional school facilities or payment in lieu of dedication, etc.). Provision should be made for allowing small developments (e.g., through zoning incentives) to encourage the development of interior parcels.

. Very light density development and open space preservation techniques should be used to protect areas along streams, watersheds which drain to public water supply sources and scenic and historic areas.

The WRPA plan recommends 2-acre minimum lot sizes in the rural portions of the region which includes all of the Town of Scotland, in order to maintain the rural character of the area, assure indefinite functioning of on-lot sewage disposal and water supply, and to avoid the inefficient, urban-suburban sprawl which occurs at densities of between one-half and two acres.

While Scotland does currently have 2-acre zoning, a recent court case found a procedural error in originally adopting that provision. This subdivision application was submitted in the interim period while two-acre zoning was suspended and the previous one-acre minimum lot size requirement was in effect. Since that time, 2-acre zoning has been readopted. For the purposes of this review, therefore, it is assumed that the proposed subdivision lots meet the minimum lot size requirements. Further exploration of this matter would require legal assistance which is beyond the scope of this ERT review.

3) Town Plan of Development

The Scotland Town Plan of Development indicates parts of this proposed subdivision fall within areas of prime agricultural soil. Site visits indicate some of this area is actively farmed.

The plan addresses agriculture as follows:

Issue: Agriculture

Active agriculture operations are a necessary ingredient to any attempt to control the future development in Scotland. It provides for a much sought after visual amenity, an important economical asset providing employment, a major source of revenue to the town and an alternate use of land which slows the conversion to residential use.

Policies:

Programs aimed at not only preserving farmlands, but encouraging continued operations should be supported. Furthermore, exclusive agricultural zoning, open space designation and State purchase of development rights should be encouraged.

Every effort should be supported to maintain agriculture as a viable economic enterprise in Scotland. Development should be encouraged to take place on less vulnerable land and not interfere with the efficiency of agricultural enterprises.

Implementation Strategies:

A special task force, made up of resident farmers, agricultural agencies, local elected officials and interested citizens should be appointed. Its objective should be to investigate and make recommendations which will assure healthy, stable and profitable agricultural operations.

The recommendations set forth in the report, if approved by the Commission, are to be included as part of the "TOWN PLAN OF DEVELOPMENT." Where appropriate, zoning regulations and administrative procedures should be changed to implement the recommendations.

The plan also addresses residential development as follows:

Issue: Residential Development

Residential development if allowed to proceed in an uncontrolled manner, can change the character of a town and the quality of life of its residents. The maintenance of low housing density, rural character of the community and protection of the existing high quality water supply, are high priority goals.

Two factors bear most directly on this area of concern: (1) the likely long-term need for all development in the community to be supported by on-site water and waste water disposal systems, and (2) the overwhelming desire of residents to maintain the town's present rural, low density character. With the anticipated slow rate of new residential development, questions of energy efficiency and savings in new utility service and road construction have little bearing on residential policies. Most new development will continue to be on existing roadways already serviced by the required utilities.

Policy:

Residential development will be encouraged at a rate consistent with the past and at a low density to ensure the permanent functioning of on-site septic disposal systems, permit new construction to blend into the rural landscape, and allow the provision of public services at reasonable rates, relative to a tax base dominated by agriculture and modest homes.

Residential development will be permitted where it will not endanger the quality of the surface and groundwater.

It is recognized that a housing shortage may present this area with a serious problem within the not too distant future. The existing zoning regulations allow for multi-family dwellings in certain instances and mobile homes for the elderly under sections 8-1(a) and 8-5(a) of the Scotland Zoning Regulations, respectively.

Implementation Strategies:

- Encourage large lot zoning.
- Strict adherence to regulations governing the installation of septic systems with adequate leaching fields.
- Review and revision of area zoned for residential development to ensure protection of environmentally sensitive areas.
- A diversity of available housing will be encouraged through the regulated conversion of larger older homes to permit apartments serving the needs of the town's elderly and new-forming families.

4) Town Zoning and Subdivision Regulations

Section 5.3.f.1 of Scotland's Zoning Regulations requires a minimum of one half acre of area not defined as wetland soils. Lot 26 should be evaluated to ensure it meets this requirement. Lot 26 is a marginal lot which is

not particularly suited for a house lot due to the extensive wetland area which makes up virtually half of the lot area. This lot should be eliminated from the subdivision and its usable area incorporated into adjacent lots. The Scotland Planning and Zoning Commission should consider increasing this minimum half acre requirement through amendment of the zoning regulations.

Section 8.10 of Scotland's zoning regulations permits cluster type lot layout as an alternate optional form of development. Cluster development of this site would allow more flexibility in protecting active agricultural operations, prime agricultural soils, and wetland areas than does standard development along existing road frontage. Cluster development could allow such areas to be left undeveloped whereas in a standard lot layout along existing road frontages, as proposed, driveways will cut across wetlands, houses will be constructed on agricultural soils, and residential development will most likely preclude continued farming in the land being divided into house lots.

Cluster development, however, would also most likely require roads into the interior of the parcel (as would a standard lot layout with a new road) and result in significantly more lots than the 26 proposed. A standard subdivision with new interior roads or a cluster development on these 62.5 acres could result in as many as 23 ± two-acre lots, or 45± one-acre lots. (Assuming 15% of land area for roads and utilities and 75% of wetland area [approximated at 7± acres] unavailable for development.)

Section 4.8 of Scotland's Subdivision Regulations allow the Commission to require dedication of park or playground areas within the subdivision, in those cases where it deems necessary to the public health and welfare. A minimum of 5%, or no less than four acres, is required if the area is deemed necessary.

Improvements to the park space including grading, erosion prevention measures, thinning of trees and shrubs, seeding and cleanup may also be required. A bond for such improvements would need to be posted as required in Section 6 of the Subdivision Regulations.

The Planning & Zoning Commission must determine whether to require such open space dedication. The town's Plan of Development recommends:

Issue: Open Space

The appearance and the perception of Scotland is determined more than anything else by the presence of significant areas of active agricultural land and extensive areas of undeveloped woodland.

Large lot zoning, existing state forest and wildlife management areas, nature conservancy and town recreation property provide for the protection of a significant amount of open space.

Policies:

Every effort will be made to protect the existing open space areas against residential and industrial development and to encourage the continued use of suitable land for agricultural purposes.

Efforts to preserve the Shetucket and Little River areas and the highland areas in southern Scotland by State and private groups should be supported and encouraged.

Implementation Strategies:

Encourage the designation of open space, forestlands and agricultural property under Section 12-107 of the Connecticut General Statutes.

An open space reservation provision should be considered and used in subdivision regulations to permit the preservation of many open space areas of scenic, historic or ecological importance.

B. SURROUNDING LAND USE AND COMPATIBILITY

The land uses surrounding this parcel include low density residential development, undeveloped wooded land, and actively farmed cropland. The proposed subdivision, 26 lots on 62.5 acres, or an average density of development of one housing unit for every 2.4 acres (assuming single family homes), would essentially double the number of housing units within a half mile area from thirty homes to almost sixty. The proposed subdivision (or indeed any residential development adjacent to active agriculture) may prove incompatible with surrounding land use.

Residential development adjacent to active agricultural operations in Connecticut often leads to land use conflicts "as newcomers to rural communities [find] objectionable some aspects of existing farm operations. The smell of manure and the presence of flies, noisy livestock, farm machinery, often run at inconvenient hours, barbed wire fences, and other aspects of normal farming practices" are seen as incompatible with adjacent development.* Connecticut's Right to Farm law, an outgrowth of this conflict between residential and agricultural uses, helps protect farmers from nuisance complaints and lawsuits but the inherent incompatibility between the uses remains.

C. LOT ARRANGEMENTS

Proposed lots 1, 2, 18, 19 and 20 have extensive wetlands across their frontage and will require permits from the Scotland Inland Wetlands Commission to cut driveways to proposed house locations. Alternate lot arrangements should be considered to eliminate the need to cross wetlands to access buildable land. As noted previously, a cluster type of lot layout could deal more effectively with these natural resource constraints. Combined driveways were discussed at the site visit as a potential means of minimizing wetlands disturbances. Scotland's Ordinance Regulating Specifications of Roads contains driveway requirements. Combined driveways are generally not allowed according to the First Selectman. Lot configurations, for these five lots, therefore, should

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*Connecticut's Right to Farm Bill by Richard Pinkham & Jim Gibbons. Cooperative Extension Service Bulletin. 8/27/81.

be reconsidered to minimize wetland crossings.

Lot 10 should be referenced on the plan with a note regarding the existing swale and rights to drain. Land labelled "Other land of Welsh" adjacent to lots 21 thru 26 should contain a note stating that the parcel is not approved for building purposes at this time.

Proposed well locations for virtually every lot in the subdivision should be relocated so that the 75' setback distance required around the well does not fall onto adjacent lots. No statute requires this, but it is a proper planning technique.

D. ROAD AND TRAFFIC CONCERNS

The proposed subdivision of 26 lots, if developed with single family homes, can be expected to generate about 260 to 276 vehicle trips per day.* Ultimately thenumber of vehicle trips actually generated will depend upon the size and price of the homes constructed, the type, age and economic class of families who reside there, the number of vehicles they own, and the price of gasoline. U.S. Census statistics (1980) indicate Scotland residents have an average of 1.32 vehicles per household, slightly lower than the average for the state (1.48) and the ten town Windham Region (1.40).

Residents of the subdivision can be expected to commute to work in adjacent towns, or further, since Scotland, a rural agricultural town, has few employment opportunities, with no industry and minimal commercial activity.

Twenty percent of Scotland's residents are employed in town; 40% are employed outside of Scotland, but within the Windham Region; and 40% are employed outside the region. The mean travel time to work for commuters is 25 minutes. With the largest number of workers destined for Windham, Mansfield, East Hartford, and Franklin.** Adding 260 to 276 vehicle trips per day scattered throughout the day will increase traffic on Pinch Street, Brooklyn Turnpike, and other area roads but shoul dnot tax the designed carrying capacity of eithe road. Peak hour traffic during morning and evening hours should average under 30 vehicles per hour.

E. SERVICES TO SUPPORT DEVELOPMENT

The proposed subdivision of 26 house lots may be expected, if developed with single family homes, to house 26 families or about 87 people based on an average family size of 3.36 persons per family (Scotland average family size, 1980 U.S. Census). Scotland's 1980 population was 1,072 persons; population estimates as of July 1, 1984 by the CT Dept. of Health Services is 1,120.

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*Based on the average single family dwelling unit generating an average of: 10.6 vehicle trips/dwelling unit/weekday. Source: Trip Generation Study of Various Land Uses, Israel Zevin, ConnDOT, 1974. 10.0 vehicle trips/dwelling unit weekday. Source: Trip Generation, 3rd edition, Institute of Transportation Engin 1983.

**1980 U.S. Census.

An average of 1.4 school aged children can be anticipated per three to four bedroom single family home,* or about 36 students. This subdivision should not significantly impact the ability of Scotland's schools to accommodate these students unless a disproportionate number fall in one age group (i.e., 25 first graders, which is unlikely). Scotland Center School, which houses grades K through 6, had an enrollment to 97 students as of 5/1/85. The school's six classrooms have a capacity for 125 first through sixth graders, housed in five classrooms with an average classroom capacity of 25 students, and two kindergarten sessions in the sixth classroom, or 30 students, for a total school capacity of 155 students according to the School Superintendent. Two portable classrooms, one currently used at a library, might also be available on a temporary basis. Parish Hill High School, in Chaplin, accommodates 7th through 12th graders from Hampton, Chaplin, and Scotland. The Superintendent of Schools estimates the school's capacity at 525 to 550 students. Enrollment as of 5/1/85 was 368.

Fire services in Scotland are provided by volunteer company, and police protection is provided through the Connecticut State Police, Danielson Troop D. Solid waste disposal for Scotland residents, as well as Hampton and Chaplin, is available at the Donahue landfill in Hampton.

This proposed subdivision, by itself, should not tax the capacity of existing services to support this new development.

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*New Jersey County & Municipal Government Study Commission, Housing Suburbs, Fiscal and Social Impact of Multifamily Development.

XIII. SUMMARY

TOPOGRAPHY AND SETTING - PAGE - 3

The 62.5 acre parcel is located in northcentral Scotland with frontage on Brooklyn Turnpike and Pinch Street. The topography is varied and includes terrain that is moderately steep to nearly flat. Most of the property is wooded with about 10 acres of cornfields. A couple of small streams flow through wetlands enroute to Merrick Brook.

GEOLOGY - PAGE - 5

The proposed subdivision lies within the Scotland topographic quadrange. A combined bedrock and surficial geologic map has been published by the U.S. Geologic Survey.

The bedrock underlying most of the site is Scotland Schist, with Hebron Formation in the eastern portion. Overlying the bedrock is till. The upper portions are loose and sandy, the lower portion is more compact. This results in a seasonally high groundwater table and low permeability. A sandier variety of till is found in the northern and western parts of the site. A firm layer and slow percolation will probably not be encountered with these soils. Stratified drift is another type of deposit found on the site. Seasonally wet areas parallel the small stream courses. Inland-wetland areas hold very low potential for development and on-site septic systems, and they should be avoided where possible.

GEOLOGIC DEVELOPMENT CONCERNS - PAGE - 7

The major hindrances to development of the site include: (1) the presence of compact till-based soils which impede the downward movement of groundwater resulting in a seasonally high groundwater table, (2) the presence of shallow to bedrock areas, and (3) presence of inland-wetland soils in various parts of the site. Steep slopes in the northern areas may be a hindrance for the construction of driveways and heavy equipment.

It appears that many of the lots will require engineered septic systems. It may be technically feasible to develop each lot, but it seems likely that preparation of leaching areas for the majority of the lots will be very costly because of techniques needed to overcome environmental limitations. Small lot size (just over an acre) may make it difficult to develop a lot using the various engineering techniques and still meet all the necessary requairements. Lot 26 is an example of this. (Page 9)

The town sanitarian will have to carefully evaluate the surface and subsurface conditions on each and every lot to determine if the lot can support a sewage disposal system, well, and house, and still meet all the code requirements. For further recommendations, see page 9 .

Wetlands crossing are undesirable, but feasible if properly engineered. (Page 9)

Cluster development should be considered in order to eliminate wetland crossings.

HYDROLOGY - PAGE - 10

Surface water and groundwater generally flows eastward toward Pinch Street, except for about 19 acres in the western portion of the site. In the western portion, surface and groundwater flows westward toward a topographic swale.

Some increases in runoff should occur but it is anticipated that increases in flood flows should be very minor. It is recommended that a stormwater management plan should be included with the final subdivision plan. The project engineer should also take a close look at all affected downstream culverts as part of the plan.

Another concern is the existing topographic swale bisecting lot 10. This swale plays some role in draining the wetland area on lots 11 and 13. It is recommended that this drainway not be disturbed unless it can be proved by a qualified engineer/ hydrologist that modification will not cause any flooding problems. (Page 12)

Wetland areas on lots 18-20, lots 1 and 2, and the wetlands east of lots 21-26 should be avoided since they provide some hydrological value.

WATER SUPPLY - PAGE - 12

Bedrock appears to be the only suitable aquifer for on-site wells.

Both the Scotland Schist and Hebron formation underlying the site contain iron-bearing minerals that may taint local well water. Water from new wells should be analyzed for chemical problems and appropriate treatment taken. Another concern is the nitrate level because of heavily fertilized agricultural acreage.

SEWAGE DISPOSAL - PAGE - 13

Based on visual observation, soil mapping and review of the engineers' soil test results, it appears that the site is not especially favorable for septic systems. For the most part, conditions will warrant detailed engineered design for sewage disposal systems. Lots 18, 19 and 26 are restricted as to usable land because of wetlands. To allow for suitable areas and better spacing of facilities consideration should be given to combining a few of these lots to create larger more satisfactory ones.

The proposed subdivision will require close supervision and inspection during construction in order to assure satisfactory conditions anproper water and sanitary facilities.

SOILS - PAGE - 14

For a brief soils description, see page 14; for detailed descriptions and a soils limitations chart, see APPENDIX.

The main natural resource limitations to development are: (1) wetland soils, (2) storm drainage, and (3) erosive soils where cropland is present.

Access to lots 1, 2, 18, 19 and 20 cross wetlands. It is recommended that crossings be minimized by either combining access drives, or by moving lot boundaries. (Page 16)

Attention to storm drainage across lot 10, and through a culvert under the drive proposed for lot 11 is important. There should be a right to drain easement across lot 10.

The site plan calls for a diversion swale between lots 24 and 25 and 25 and 23. An alternative is discussed on page 16.

Where cropland is present, a good winter rye cover should be used to prevent erosion due to slope.

An Erosion and Sediment Control (ESC) Plan should be part of the site development plan.

VEGETATION - PAGE - 17

The parcel may be divided into five major vegetation types. (See Vegetation Map, page 18)

After construction is completed, areas of vegetation Type A should be regenerated by the group tree selection system (page 17). Vegetation Type B should be lightly thinned. Vegetation Type C should be left as is and re-evaluated in 10 years. Type D could

be left alone or reinforced by planting conifers. A public service forester or a private consultant should be contacted to select areas for harvesting, revenue from the harvest would cover the consultant costs.

Disturbances near trees from development practices may cause problems relating to tree health and mortality. Care should be during construction not to disturb the trees that are to remain. Trees should be saved in small groups because this lowers the possibility of soil disturbance and mechanical injury. The loss of trees due to windthrow is a potential hazard in the Hardwood Swamp (Type B), clearing of this type should be kept to a minimum.

WILDLIFE HABITAT - PAGE - 20

The wetlands portion of the site serves an important function for wildlife by providing habitat requirements needed for survival. Development will decrease the amount and the quality of habitat, but there are management considerations which would lessen the impact on wildlife. Thought should be given to the design of the development so that as much open space as possible is left. A buffer area of vegetation should be left along the watercourses. As many trees as possible should be left when clearing for building, and landscaping should be done with wildlife in mind.

FISHERIES HABITAT - PAGE - 22

Immediately downstream from the proposed subdivision the intermittent stream supports good numbers of brook trout. Removal of trees along the stream would allow more sunlight to reach the stream causing an increase in temperature and a decline in the brook trout. Impact on the stream can be minimized by (1) leaving a 100 foot wide buffer zone and (2) by taking adequate erosion and siltation control measures along the stream.

PLANNING CONCERNS - PAGE - 22

A. Relationship to Plans

1. State Plan of Conservation and Development (Page 22)
2. Regional Plan of Development (Page 24)
3. Town Plan of Development (Page 25)
4. Town Zoning and Subdivision Regulations (Page 26)
   - Lot 26 should be evaluated to ensure that it meets the minimum of one half acre of area not defined of wetland soils.
   - The Planning and Zoning Commission should consider increasing this one half acre of area not defined as wetland soils in Section 5.3.f.1 of the Zoning Regulations.

- Cluster development is an alternate optional form of development which should be considered.
- The Planning and Zoning Commission must determine whether or not to require open space dedication.

B. Surrounding Land Use and Compatibility (page 28)

The proposed subdivision would essentially double the number of housing units within a half mile area from thirty homes to almost sixty. The proposed subdivision or any residential development adjacent to active agriculture may prove incompatible with surrounding land use.

C. Lot Arrangement (page 28)

Proposed lots 1, 2, 18, 19 and 20 have extensive wetlands across their frontages, alternative lot arrangements should be considered to eliminate the need to cross the wetlands to access buildable land.

Lot 10 should be referenced on the plan with a note regarding the existing swale and the right to drain.

D. Road and Traffic Concerns (page 29)

The proposed subdivision can be expected to generate about 260 to 276 vehicle trips per day. This many trips per day will increase traffic on Brooklyn Turnpike, Pinch Street and other area roads, but should not tax the designed carrying capacity of either road.

E. Services to Support Development (page 29)

The proposed subdivision, by itself, will not tax the capacity of existing services (schools, fire, police and solid waste disposal) to support this new development.

Appendix

A.

Brooklyn Turnpike & Pinch Street
Scotland, CT

Principal Limitations and Ratings of Soils for: Residential Development

SOIL MAP SYMBOL AND SOIL NAME	DWELLINGS WITHOUT BASEMENTS	DWELLINGS WITH BASEMENTS	LAWNS AND LANDSCAPING	SEPTIC TANK ABSORPTION FIELDS	LOCAL ROADS AND STREETS
GbB - Gloucester	Moderate-large stones	Moderate-large stones	Moderate-small stones,droughty	Severe-poor filter	Moderate-large stones
GbC - Gloucester	Moderate-large stones,slope	Moderate-large stones,slope	Moderate-slope, small stones, droughty	Severe-poor filter	Moderate-slope, large stones
HkC - Hinckley	Moderate-slope	Moderate-slope	Severe-small stones,droughty	Severe-poor filter	Moderate-slope
PdB - Paxton	Moderate-wetness	Moderate-wetness	Moderate-large stones	Severe-percs slowly	Moderate-wetness, frost action
PdC - Paxton	Moderate-wetness, slope	Moderate-wetness, slope	Moderate-large stones,slope	Severe-percs slowly	Moderate-wetness, slope,frost action
PeD - Paxton	Severe-slope	Severe-slope	Severe-slope	Severe-slope, percs slowly	Severe-slope
*Rn - Ridgebury	Severe-wetness	Severe-wetness	Severe-wetness	Severe-percs slowly, wetness	Severe-wetness, frost action
Whitman	Severe-ponding	Severe-ponding	Severe-large stones,ponding	Severe-percs slowly, ponding	Severe-frost action, ponding
Leicester	Severe-wetness	Severe-wetness	Severe-wetness	Severe-wetness	Severe-wetness, frost action
WyB - Woodbridge	Moderate-wetness	Severe-wetness	Moderate-large stones,wetness	Severe-wetness, percs slowly	Severe-frost action

SOIL MAP SYMBOL AND SOIL NAME	DWELLINGS WITHOUT BASEMENTS	DWELLINGS WITH BASEMENTS	LAWNS AND LANDSCAPING	SEPTIC TANK ABSORPTION FIELDS	LOCAL ROADS AND STREETS
WzA - Woodbridge	Moderate-wetness	Severe-wetness	Moderate-large stones,wetness	Severe-wetness, percs slowly	Severe-frost action
WzC - Woodbridge	Moderate-wetness, slope	Severe-wetness	Moderate-large stones,wetness, slope	Severe-wetness, percs slowly	Severe-frost action

SOIL DESCRIPTIONS

CcB—Canton and Charlton very stony fine sandy loams, 3 to 8 percent slopes. This unit consists of gently sloping, well drained soils on ridges, hills, and side slopes of glacial till uplands. The areas are mostly long and narrow or oval and range from 5 to 50 acres. Slopes are mainly smooth and convex and are 200 to 400 feet long. Stones cover 1 to 8 percent of the surface. About 45 percent of the total acreage of this unit is Canton soils, 40 percent is Charlton soils, and 15 percent is other soils. Some areas of this unit consist almost entirely of Canton soils, some almost entirely of Charlton soils, and some of both. The soils were mapped together because they have no significant differences in use and management.

Typically, the Canton soils have a surface layer of very dark grayish brown fine sandy loam 2 inches thick. The subsoil is yellowish brown fine sandy loam, gravelly fine sandy loam, and gravelly sandy loam 21 inches thick. The substratum is pale brown gravelly loamy sand to a depth of 60 inches or more.

Typically, the Charlton soils have a surface layer of dark yellowish brown fine sandy loam 5 inches thick. The subsoil is yellowish brown fine sandy loam and sandy loam 20 inches thick. The substratum is light yellowish brown and light brownish gray sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of somewhat excessively drained Gloucester and Hollis soils, well drained Paxton soils, and moderately well drained Sutton soils. Also included are a few large, nearly level areas and a few areas that have a compact substratum at a depth of 40 to 50 inches.

The water table in these Canton and Charlton soils is commonly at a depth of more than 6 feet. The permeability of the Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. The permeability of the Charlton soils is moderate or moderately rapid. Both soils have moderate available water capacity and medium runoff, and both are very strongly acid to medium acid.

Most areas of this unit are woodland. The soils in a few areas are used for pasture or hay. In some areas they are in community development or are used for recreation.

The soils of this unit generally are too stony for cultivation. Stone removal makes the soils well suited to cultivated crops but is difficult. The soils are well suited to use as woodland, but the Charlton soils have higher productivity than the Canton soils.

Some excavations in the Canton soils are unstable. The stones on the surface limit landscaping.

The capability subclass is VIs.

CcC—Canton and Charlton very stony fine sandy loams, 8 to 15 percent slopes. This unit consists of sloping, well drained soils on ridges, hills, and side slopes of glacial till uplands. The areas are mostly long and narrow and range from 3 to 20 acres. Slopes are mainly smooth and convex and less than 200 feet long. Stones cover 1 to 8 percent of the surface. About 45 percent of the total acreage of this unit is Canton soils, 40 percent is Charlton soils, and 15 percent is other soils. Some areas of this unit consist almost entirely of Canton soils, some almost entirely of Charlton soils, and some of both. The soils were mapped together because they have no significant differences in use and management.

Typically, the Canton soils have a surface layer of very dark grayish brown fine sandy loam about 2 inches thick. The subsoil is yellowish brown fine sandy loam, gravelly fine sandy loam, and gravelly sandy loam 21 inches thick. The substratum is pale brown gravelly loamy sand to a depth of 60 inches or more.

Typically, the Charlton soils have a surface layer of dark yellowish brown fine sandy loam 5 inches thick. The subsoil is yellowish brown fine sandy loam and sandy loam 20 inches thick. The substratum is light yellowish brown and light brownish gray sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of somewhat excessively drained Gloucester and Hollis soils, well drained Paxton soils, and moderately well drained Sutton soils. A few areas have a compact substratum at a depth of 40 to 50 inches.

The water table in these Canton and Charlton soils is commonly at a depth of more than 6 feet. The permeability of the Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. The permeability of the Charlton soils is moderate or moderately rapid. Both soils have moderate available water capacity and rapid runoff, and both are very strongly acid to medium acid.

Most areas of this unit are in woodland. A few areas are used for pasture and hay. Some areas are in community development.

The soils of this unit are too stony for cultivation. Stone removal makes the soils suited to cultivated crops but is difficult. The soils are well suited to woodland, but the Charlton soils have higher productivity than the Canton soils.

Slope is the main limitation of the soils for community development, especially for onsite septic systems. Slopes of excavations are unstable. The stones on the surface limit landscaping.

The capability subclass is VIs.

CdC—Canton and Charlton extremely stony fine sandy loams, 3 to 15 percent slopes. This unit consists of gently sloping to sloping, well drained soils on ridges, hills, and side slopes of glacial till uplands. The areas are oval or irregular in shape and range from 5 to 100 acres. Slopes are mostly smooth and convex and are 100 to 600 feet long. Stones cover 8 to 25 percent of the surface. About 45 percent of the total acreage of this unit is Canton soils, 40 percent is Charlton soils, and 15 percent is other soils. Some areas of this unit consist almost entirely of Canton soils, some almost entirely of Charlton soils, and some of both. The soils were mapped together because they have no significant differences in use and management.

Typically, the Canton soils have a surface layer of very dark grayish brown fine sandy loam 2 inches thick. The subsoil is yellowish brown fine sandy loam, gravelly fine sandy loam, and gravelly sandy loam 21 inches thick. The substratum is pale brown gravelly loamy sand to a depth of 60 inches or more.

Typically, the Charlton soils have a surface layer of dark yellowish brown fine sandy loam 5 inches thick. The subsoil is yellowish brown fine sandy loam and sandy loam 20 inches thick. The substratum is light yellowish brown and light brownish gray sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of somewhat excessively drained Gloucester and Hollis soils, well drained Paxton soils, and moderately well drained Sutton soils. Also included are a few nearly level areas and a few areas that have a compact substratum at a depth of 40 to 50 inches.

The water table in these Canton and Charlton soils is commonly at a depth of more than 6 feet. The permeability of the Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. The permeability of the Charlton soils is moderate or moderately rapid. Both soils have moderate available water capacity and medium to rapid runoff, and both are very strongly acid to medium acid.

Most areas of this unit are in woodland. A few areas are used for pasture, and a few others are in community development.

The soils of this unit generally are too stony for cultivation (fig. 5). Stone removal makes the soils suited to cultivation but is difficult. The soils are well suited to woodland, but the Charlton soils have higher productivity than the Canton soils. The stones on the surface hinder the use of some woodland harvesting equipment.

Slope is the main limitation of the soils for community development, especially for onsite septic systems. Slopes of excavations in these soils are unstable. The stones on the surface hinder landscaping.

The capability subclass is VIIs.

CdD—Canton and Charlton extremely stony fine sandy loams, 15 to 35 percent slopes. This unit consists of moderately steep to steep, well drained soils on ridges, hills, and side slopes of glacial till uplands. The areas are mostly long and narrow and range from 5 to 30 acres. Slopes are smooth and convex and are mainly less than 200 feet long. Stones cover 8 to 25 percent of the surface. About 45 percent of the total acreage of this unit is Canton soils, 40 percent is Charlton soils, and 15 percent is other soils. Some areas consist almost entirely of Canton soils, some almost entirely of Charlton soils, and some of both. The soils were mapped together because they have no significant differences in use and management.

Typically, the Canton soils have a surface layer of very dark grayish brown fine sandy loam 2 inches thick. The subsoil is yellowish brown fine sandy loam, gravelly fine sandy loam, and gravelly sandy loam 21 inches thick. The substratum is pale brown gravelly loamy sand to a depth of 60 inches or more.

Typically, the Charlton soils have a surface layer of dark yellowish brown fine sandy loam 5 inches thick. The subsoil is yellowish brown fine sandy loam 20 inches thick. The substratum is light yellowish brown and light brownish gray sandy loam to a depth of 60 inches.

Included with these soils in mapping are small areas of somewhat excessively drained Gloucester and Hollis soils and well drained Paxton soils. Also included are a few large areas where stones cover less than 8 percent of the surface and areas with a compact substratum at a depth of 40 to 50 inches.

The water table in these Canton and Charlton soils is commonly at a depth of more than 6 feet. The permeability of the Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. The permeability of the Charlton soils is moderate or moderately rapid. Both soils have moderate available water capacity and rapid runoff, and both are very strongly acid to medium acid.

Most areas of this unit are in woodland. A few small areas are used for pasture.

The stones on the surface and slope make the soils of this unit generally unsuitable for cultivation. The soils are fairly suited to woodland; the Charlton soils have higher productivity than the Canton soils. Slope and the stones hinder the use of some woodland harvesting equipment.

Slope limits the soils of this unit for community development, especially for onsite septic systems. Slopes of excavations in the soils are unstable, and the stones on the surface hinder landscaping.

The capability subclass is VIIs.

GbC—Gloucester very stony sandy loam, 8 to 15 percent slopes. This soil is sloping and somewhat excessively drained. It is on ridges and hills of glacial till uplands. The areas are mostly long and narrow or oval and range from 15 to 40 acres. Stones and boulders cover 1 to 8 percent of the surface. Slopes are mainly smooth and convex and 200 to 400 feet long.

Typically, this soil has a surface layer of very dark grayish brown sandy loam 4 inches thick. The subsoil is dark yellowish brown and yellowish brown gravelly sandy loam and loamy sand 21 inches thick. The substratum is light olive brown and light brownish gray gravelly loamy coarse sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Hinckley soils and well drained Canton, Charlton, and Paxton soils. Also included are a few areas where stones cover less than 1 percent of the surface. Included areas make up about 15 percent of the unit.

The water table in this Gloucester soil is commonly below a depth of 6 feet. The available water capacity is low. The permeability of this soil is rapid. Runoff is medium to rapid. The soil is very strongly acid to medium acid.

Most areas of this soil are in woodland. A few areas are in pasture, and a few are in community development.

This soil generally is too stony and too droughty for cultivation. The soil is suited to woodland, but droughtiness causes a high rate of seedling mortality.

This soil is generally suited to community development, but slope is a limitation for onsite septic systems and the rapid permeability causes a hazard of ground-water pollution in areas used for septic tanks. Some slopes of excavations in this soil are unstable. The stones on the surface hinder landscaping.

The capability subclass is VIs.

HkC—Hinckley gravelly sandy loam, 3 to 15 percent slopes. This is a gently sloping to sloping, excessively drained soil on terraces of stream valleys and on glacial outwash plains. The areas of this soil are oval or irregular in shape and range from 5 to 200 acres. Slopes are convex or undulating and are mostly less than 200 feet long.

Typically, the surface layer is very dark grayish brown gravelly sandy loam 2 inches thick (fig. 7). The subsoil is dark yellowish brown, yellowish brown, and brownish yellow gravelly sandy loam and gravelly loamy sand 16 inches thick. The substratum is pale yellow gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Windsor soils, somewhat excessively drained Merrimac soils, well drained Agawam soils, and moderately well drained Sudbury soils. Also included are a few areas of a soil with a surface layer of fine sandy loam and a few small areas with a few stones on the surface. Included areas make up about 15 percent of the unit.

The water table in this Hinckley soil is commonly below a depth of 6 feet. The available water capacity is low. Runoff is rapid. This soil has rapid permeability in the surface layer and subsoil and very rapid permeability in the substratum, and it is extremely acid to medium acid.

Most areas of this soil are in woodland. Some areas are in cropland, and a few large areas are in community development.

Irrigated areas of this soil are well suited to cultivated crops; nonirrigated areas are fairly suited. The soil dries and warms early in the spring and is easy to till. Minimum tillage and cover crops help to minimize the moderate erosion hazard in cultivated areas.

Droughtiness makes this soil poorly suited to use as woodland; it increases seedling mortality.

This soil generally is suited to community development, but the rapid permeability imposes a hazard of ground-water pollution in areas used for septic tanks. The slopes in some excavated areas are unstable.

The capability subclass is IVs.

PdB—Paxton very stony fine sandy loam, 3 to 8 percent slopes. This soil is gently sloping and well drained. It is on the tops and side slopes of drumlins and large hills of glacial till uplands. The areas are mostly oval or irregular in shape and range from 3 to 50 acres. Stones and boulders cover 1 to 8 percent of the surface.

Typically, the surface layer is dark brown fine sandy loam 7 inches thick. The subsoil is yellowish brown and dark yellowish brown fine sandy loam 18 inches thick. The substratum is very firm to firm, olive brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of somewhat excessively drained Hollis soils, well drained Charlton soils, moderately well drained Woodbridge soils, and poorly drained Ridgebury soils. Also included are a few nearly level areas and small areas that have no stones on the surface. A few large areas have a substratum of loamy sand. Included areas make up about 10 percent of the unit.

This Paxton soil has a seasonal high water table perched at a depth of about 2 feet for several weeks in the spring. This soil has moderate permeability in the surface layer and subsoil and slow to very slow permeability in the substratum. Runoff is medium. The soil has moderate available water capacity and is very strongly acid to slightly acid.

This soil is mostly in woodland. A few areas are in pasture or community development.

This soil generally is too stony for cultivation but is well suited to woodland. Stone removal makes the soil well suited to cultivated crops but is difficult. Cover crops and minimum tillage help to control erosion and maintain tilth in cultivated areas.

The slow to very slow permeability of the substratum limits this soil for community development, especially for onsite septic systems. Steep slopes of excavations in this soil slump when saturated. Lawns are commonly soggy in autumn and spring. The stones on the surface hinder landscaping.

The capability subclass is VIs.

PdC—Paxton very stony fine sandy loam, 8 to 15 percent slopes. This soil is sloping and well drained. It is on the side slopes of drumlins and hills of glacial till uplands. The areas are mostly oval or irregular in shape and range from 4 to 20 acres. Stones and boulders cover 1 to 8 percent of the surface.

Typically, the surface layer is dark brown fine sandy loam 7 inches thick. The subsoil is yellowish brown and dark yellowish brown fine sandy loam 18 inches thick. The substratum is very firm to firm, olive brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of somewhat excessively drained Hollis soils, well drained Charlton soils, moderately well drained Woodbridge soils, and poorly drained Ridgebury soils. Also included are a few small areas with no stones on the surface and a few large areas that have a substratum of loamy sand. Included areas make up about 10 percent of the unit.

This Paxton soil has a seasonal high water table perched at a depth of about 2 feet for several weeks in the spring. This soil has moderate permeability in the surface layer and subsoil and slow to very slow permeability in the substratum. Runoff is rapid. The soil has moderate available water capacity and is very strongly acid to slightly acid.

This soil is mostly in woodland. A few areas are in pasture or community development.

This soil generally is too stony for cultivation but is well suited to woodland. Stone removal makes this soil suited to cultivated crops but is difficult. Maintaining a permanent plant cover helps to control erosion in cultivated areas.

Slope and the slow or very slow permeability of the substratum limit this soil for community development, especially for onsite septic systems. Steep slopes of excavations in this soil slump when saturated. Lawns are commonly soggy in autumn and spring. The stones on the surface hinder landscaping.

The capability subclass is VIs.

PeD—Paxton extremely stony fine sandy loam, 15 to 35 percent slopes. This soil is moderately steep to steep and well drained. It is on side slopes of drumlins and hills of glacial till uplands. Areas of this soil are mostly oval or long and narrow and range from 5 to 25 acres. Stones and boulders cover 8 to 25 percent of the surface.

Typically, the surface layer is dark brown fine sandy loam 7 inches thick. The subsoil is yellowish brown and dark yellowish brown fine sandy loam 18 inches thick. The substratum is very firm to firm, olive brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of somewhat excessively drained Hollis soils, well drained Charlton soils, and moderately well drained Woodbridge soils. Also included are a few large areas where stones cover less than 8 percent of the surface and a few areas that have a substratum of loamy sand. Included areas make up about 15 percent of the unit.

This Paxton soil has a seasonal high water table perched at a depth of about 2 feet for several weeks in the spring. This soil has moderate permeability in the surface layer and subsoil and slow to very slow permeability in the substratum. Runoff is rapid. The soil has moderate available water capacity and is very strongly acid to slightly acid.

This soil is mostly in woodland. A few areas are used for pasture or community development.

This soil generally is too stony and too steep for cultivation. The soil is well suited to woodland, but the stones and slope hinder the use of some types of harvesting equipment.

Slope and the slow or very slow permeability of the substratum are major limitations of this soil for community development, especially for onsite septic systems. Steep slopes of excavations in this soil slump when saturated. Lawns are soggy in autumn and spring.

The capability subclass is VIIs.

Rn—Ridgebury, Leicester, and Whitman extremely stony fine sandy loams. This unit consists of nearly level, poorly drained and very poorly drained soils in depressions and drainageways of glacial till uplands. The areas are mostly long and narrow or irregular in shape and range from 5 to 150 acres. Slopes range from 0 to 3 percent and are mainly 100 to 300 feet long. Stones cover 8 to 25 percent of the surface. About 40 percent of the total acreage of this unit is Ridgebury soils, 35 percent is Leicester soils, 15 percent is Whitman soils, and 10 percent is other soils. Some areas of this unit consist of one of these soils, and some others consist of two or three. The soils of this unit were mapped together because they have no significant differences in use and management.

Typically, the Ridgebury soils have a surface layer of very dark brown fine sandy loam 8 inches thick. The subsoil is mottled, light brownish gray fine sandy loam 8 inches thick. The substratum is very firm to firm, grayish brown and light brownish gray fine sandy loam and sandy loam to a depth of 60 inches or more.

Typically, the Leicester soils have a surface layer of very dark brown fine sandy loam 7 inches thick. The subsoil is mottled, grayish brown and light olive brown fine sandy loam 23 inches thick. The substratum is mottled, light olive brown and grayish brown sandy loam to a depth of 60 inches or more.

Typically, the Whitman soils have a surface layer of very dark gray fine sandy loam 9 inches thick. The subsoil is gray, mottled fine sandy loam 5 inches thick. The substratum is mottled, light olive gray fine sandy loam and sandy loam to a depth of 60 inches or more.

Included with this unit in mapping are small areas of moderately well drained Sutton and Woodbridge soils and very poorly drained Adrian and Palms soils. Also included are a few areas where stones cover less than 8 percent of the surface.

The Ridgebury soils have a seasonal high water table at a depth of about 10 inches from fall through spring. The permeability of the soils is moderate to moderately rapid in the surface layer and subsoil and slow to very slow in the substratum. Runoff is slow. The Ridgebury soils have moderate available water capacity and are very strongly acid to medium acid.

The Leicester soils have a seasonal high water table at a depth of about 10 inches from fall through spring. The permeability of the soils is moderate or moderately rapid. Runoff is slow. The Leicester soils have moderate available water capacity and are very strongly acid to medium acid.

The Whitman soils have a seasonal high water table at or near the surface from fall through spring. The permeability of the soils is moderate or moderately rapid in the surface layer and subsoil and slow to very slow in the substratum. Runoff is slow. The Whitman soils have moderate available water capacity and are very strongly acid to slightly acid.

This unit is mostly in woodland. A few small areas are used for pasture or community development.

The soils of this unit are too stony for cultivation. The unit is suited to woodland. However, the stones on the surface and the high water table hinder the use of harvesting equipment. The water table causes a high rate of seedling mortality and restricts rooting, causing a hazard of uprooting during windy periods.

The high water table and slow to very slow permeability are major limitations of the soils of this unit for community development. Steep slopes of excavations in these soils slump when saturated. The stones on the surface restrict landscaping, and lawns are soggy most of the year.

Ru—Rippowam fine sandy loam. This soil is nearly level and poorly drained. It is on the lowest parts of the flood plains of major streams and their tributaries. The areas are mostly long and narrow and range from 5 to 100 acres. Slopes range from 0 to 3 percent.

Typically, the surface layer is very dark gray fine sandy loam 7 inches thick. The subsoil is dark brown, grayish brown, and dark grayish brown, mottled fine sandy loam 28 inches thick. The substratum is grayish brown and gray gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of moderately well drained Pootatuck soils, poorly drained Leicester soils, and very poorly drained Saco soils. Also included are a few large areas with a surface layer and subsoil of silt loam. Included areas make up about 20 percent of the unit.

This Rippowam soil has a seasonal high water table at a depth of about 10 inches from fall through spring. The soil is subject to frequent flooding, mainly from fall to spring. It has moderate or moderately rapid permeability in the surface layer and subsoil and rapid or very rapid permeability in the substratum. Runoff is slow. The soil has moderate available water capacity and is very strongly acid to medium acid.

This soil is mostly in woodland. Some areas are in hay or pasture or are used for corn for silage.

Drained areas of this soil are suited to cultivated crops. The seasonal high water table causes the soil to dry slowly in the spring, often delaying planting and making undrained areas poorly suited to cultivation.

The soil is suited to woodland, but the water table causes a high rate of seedling mortality and restricts the use of some types of harvesting equipment for part of the year.

Frequent flooding and the seasonal high water table are major limitations of this soil for community development. Steep slopes of excavations in this soil are unstable, and lawns are soggy from fall through spring. The rapid permeability in the substratum causes a hazard of ground-water poliution in areas used for septic tanks.

The capability subclass is IIIw.

SvB—Sutton fine sandy loam, 3 to 8 percent slopes. This soil is gently sloping and moderately well drained. It is near the base of slopes and in slight depressions in glacial till uplands. The areas are mostly long and narrow or irregular in shape and range from 4 to 50 acres. Slopes are smooth and concave.

Typically, the surface layer is dark brown fine sandy loam 5 inches thick. The subsoil is mottled, yellowish brown fine sandy loam and sandy loam 30 inches thick. The substratum is mottled, light olive brown sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Canton, Charlton, and Paxton soils; moderately well drained Woodbridge soils; and poorly drained Leicester soils. A few small areas have stones on the surface. Included areas make up about 15 percent of the unit.

This Sutton soil has a seasonal high water table at a depth of about 20 inches from fall to spring. This soil has moderate or moderately rapid permeability. Runoff is medium. The soil has moderate available water capacity and is very strongly acid to medium acid.

This soil is mostly used for corn for silage and hay and pasture. A few areas are in woodland, and a few are in community development.

This soil is well suited to woodland and cultivated crops. The seasonal high water table is the main limitation for crops. It causes the soil to dry slowly in the spring, restricting the use of farming equipment. Providing drainage helps to dry this soil earlier in the spring, but even drained areas remain wet for several days after heavy rains. Minimum tillage and cover crops help to maintain tilth and control a moderate erosion hazard in cultivated areas.

The seasonal high water table is the main limitation of this soil for community development, especially for homesites and onsite septic systems. Lawns on this soil are soggy in autumn and spring.

The capability subclass is IIw.

SwB—Sutton very stony fine sandy loam, 3 to 8 percent slopes. This soil is gently sloping and moderately well drained. It is near the base of slopes and in slight depressions in glacial till uplands. The areas are mostly oval or irregular in shape and range from 3 to 50 acres. Stones cover 1 to 8 percent of the surface. Slopes are smooth and concave.

Typically, the surface layer is dark brown fine sandy loam 5 inches thick. The subsoil is mottled, yellowish brown fine sandy loam and sandy loam 30 inches thick. The substratum is mottled, light olive brown sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Canton, Charlton, and Paxton soils; moderately well drained Woodbridge soils; and poorly drained Leicester soils. A few areas do not have stones on the surface. Included areas make up about 15 percent of the unit.

This Sutton soil has a seasonal high water table at a depth of about 20 inches from fall to spring. This soil has moderate or moderately rapid permeability. Runoff is medium. The soil has moderate available water capacity and is very strongly acid to medium acid.

This soil is mostly in woodland. A few areas are in pasture or community development.

This soil generally is too stony for cultivation but is well suited to woodland. Stones hinder the use of farming equipment and are difficult to remove. The seasonal high water table, which causes the soil to dry slowly in the spring, is an additional limitation for crops.

The seasonal high water table is the main limitation of this soil for community development, especially for homesites and onsite septic systems. Lawns on this soil are soggy in autumn and spring.

The capability subclass is VIs.

SxB—Sutton extremely stony fine sandy loam, 3 to 8 percent slopes. This soil is gently sloping and moderately well drained. It is at the base of slopes and in slight depressions in glacial till uplands. The areas are mostly oval or irregular in shape and range from 5 to 35 acres. Stones cover 8 to 25 percent of the surface. Slopes are smooth and concave.

Typically, the surface layer is dark brown fine sandy loam 5 inches thick. The subsoil is mottled, yellowish brown fine sandy loam and sandy loam 30 inches thick. The substratum is mottled, light olive brown sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Canton, Charlton, and Paxton soils; moderately well drained Woodbridge soils; and poorly drained Leicester soils. Also included are a few small areas where stones cover less than 8 percent of the surface or where slopes are more than 8 percent. Included areas make up about 15 percent of the unit.

This Sutton soil has a seasonal high water table at a depth of about 20 inches from fall to spring. This soil has moderate or moderately rapid permeability. Runoff is medium. The soil has moderate available water capacity and is very strongly acid to medium acid.

This soil is mostly in woodland. A few areas are in pasture or community development.

This soil generally is too stony for cultivation. The soil is well suited to woodland, but the stones hinder the use of some types of harvesting equipment.

The seasonal high water table is the main limitation of this soil for community development, especially for homesites and onsite septic systems. Lawns on this soil are soggy in autumn and spring.

The capability subclass is VIIs.

WyA—Woodbridge very stony fine sandy loam, 0 to 3 percent slopes. This soil is nearly level and moderately well drained. It is on the tops and lower side slopes of large drumlins and hills on glacial till uplands. The areas are mostly oval or irregular in shape and range from 3 to 30 acres. Stones cover 1 to 8 percent of the surface.

Typically, the surface layer is very dark grayish brown fine sandy loam 8 inches thick. The subsoil is mottled, dark yellowish brown and yellowish brown fine sandy loam 22 inches thick. The substratum is firm to very firm, olive gray fine sandy loam and gravelly fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Paxton soils, moderately well drained Sutton soils, and poorly drained Leicester and Ridgebury soils. A few small areas do not have stones on the surface. Included areas make up about 15 percent of the unit.

This Woodbridge soil has a seasonal high water table at a depth of about 20 inches from fall to spring. It has moderate available water capacity. This soil has moderate permeability in the surface layer and subsoil and slow to very slow permeability in the substratum. Runoff is slow. The soil is very strongly acid to medium acid in the surface layer and subsoil and very strongly acid to slightly acid in the substratum.

This soil is mostly in woodland. A few areas are in pasture, and a few are in community development.

This soil generally is too stony for cultivation but is well suited to woodland. Stone removal makes the soil well suited to crops but is difficult. Seasonal wetness in fall and spring is an additional limitation for crops.

The water table and the slow or very slow permeability in the substratum are the main limitations of this soil for community development, especially for onsite septic systems. Lawns on this soil are soggy in the autumn and spring and after heavy rains.

The capability subclass is Vs.

WyB—Woodbridge very stony fine sandy loam, 3 to 8 percent slopes. This soil is gently sloping and moderately well drained. It is on the tops and side slopes of drumlins and hills on glacial till uplands. The areas are mostly long and narrow or irregular in shape and range from 3 to 25 acres. Stones cover 1 to 8 percent of the surface.

Typically, the surface layer is very dark grayish brown fine sandy loam 8 inches thick. The subsoil is mottled, dark yellowish brown and yellowish brown fine sandy loam 22 inches thick. The substratum is firm to very firm, olive gray fine sandy loam and gravelly fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Paxton soils, moderately well drained Sutton soils, and poorly drained Leicester and Ridgebury soils. A few small areas do not have stones on the surface. Included areas make up about 10 percent of the unit.

This Woodbridge soil has a seasonal high water table at a depth of about 20 inches from fall to spring. The available water capacity is moderate. This soil has moderate permeability in the surface layer and subsoil and slow to very slow permeability in the substratum. Runoff is medium. The soil is very strongly acid to medium acid in the surface layer and subsoil and very strongly acid to slighty acid in the substratum.

Most areas of this soil are in woodland. A few areas are in pasture, and a few are in community development.

This soil generally is too stony for cultivation but is well suited to woodland. Stone removal makes the soil well suited to cultivated crops but is difficult. Seasonal wetness is an additional limitation of the soil for crops.

The water table and the slow or very slow permeability in the substratum are the main limitations of this soil for community development, especially for onsite septic systems. Lawns on this soil are soggy in the autumn and spring and after heavy rains.

The capability subclass is VIs.

WzA—Woodbridge extremely stony fine sandy loam, 0 to 3 percent slopes. This soil is nearly level and moderately well drained. It is on the tops of large drumlins and hills on glacial till uplands. The areas are mostly oval or irregular in shape and range from 5 to 40 acres. Stones cover 8 to 25 percent of the surface.

Typically, the surface layer is very dark grayish brown fine sandy loam 8 inches thick. The subsoil is mottled, dark yellowish brown and yellowish brown fine sandy loam 22 inches thick. The substratum is firm to very firm, olive gray fine sandy loam and gravelly fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Paxton soils, moderately well drained Sutton soils, and poorly drained Ridgebury soils. Also included are a few small areas where stones cover less than 8 percent of the surface. Included areas make up about 15 percent of the unit.

This Woodbridge soil has a seasonal high water table at a depth of about 20 inches from fall to spring. It has moderate available water capacity. The soil has moderate permeability in the surface layer and subsoil and slow to very slow permeability in the substratum. Runoff is medium. The soil is very strongly acid to medium acid in the surface layer and subsoil and very strongly acid to slightly acid in the substratum.

This soil is mostly in woodland. A few areas are in pasture, and a few are in community development.

This soil generally is too stony for cultivation but is well suited to woodland. Stone removal makes the soil well suited to crops but is difficult. Seasonal wetness in fall and spring is an additional limitation for crops.

The water table and the slow or very slow permeability in the substratum are the main limitations of this soil for community development, especially for onsite septic systems. Lawns on this soil are soggy in the autumn and spring and after heavy rains.

The capability subclass is VIIs.

WzC—Woodbridge extremely stony fine sandy loam, 3 to 15 percent slopes. This soil is gently sloping to sloping and moderately well drained. It is on the tops of large drumlins and hills on glacial till uplands. The areas are mostly oval or irregular in shape and range from 3 to 60 acres. Stones cover 8 to 25 percent of the surface.

Typically, the surface layer is very dark grayish brown fine sandy loam 8 inches thick. The subsoil is mottled, dark yellowish brown and yellowish brown fine sandy loam 22 inches thick. The substratum is firm to very firm, olive gray fine sandy loam and gravelly fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Paxton soils, moderately well drained Sutton soils, and poorly drained Ridgebury soils. Included areas make up about 15 percent of the unit.

This Woodbridge soil has a seasonal high water table at a depth of about 20 inches from fall to spring. It has moderate available water capacity. The soil has moderate permeability in the surface layer and subsoil and slow to very slow permeability in the substratum. Runoff is rapid. This soil is very strongly acid to medium acid in the surface layer and subsoil and very strongly acid to slightly acid in the substratum.

This soil is mostly in woodland. A few areas are in pasture, and a few are in community development.

This soil generally is too stony for cultivation but is well suited to woodland. Stone removal makes the soil well suited to crops but is difficult. Seasonal wetness in fall and spring is an additional limitation for crops.

The water table and the slow or very slow permeability in the substratum are the main limitations of this soil for community development, especially for onsite septic systems. Lawns on this soil are soggy in the autumn and spring and after heavy rains.

The capability subclass is VIIs.

About The Team

The Eastern Connecticut Environmental Review Team (ERT) is a group of professionals in environmental fields drawn together from a variety of federal, state, and regional agencies. Specialists on the Team include geologists, biologists, foresters, climatologists, soil scientists, landscape architects, archeologists, recreation specialists, engineers and planners. The ERT operates with state funding under the supervision of the Eastern Connecticut Resource Conservation and Development (RC&D) Area--an 86 town area.

The Team is available as a public service at no cost to Connecticut towns.

PURPOSE OF THE TEAM

The Environmental Review Team is available to help towns and developers in the review of sites proposed for major land use activities. To date, the ERT has been involved in reviewing a wide range of projects including subdivisions, sanitary landfills, commercial and industrial developments, sand and gravel operations, elderly housing, recreation/open space projects, watershed studies and resource inventories.

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

REQUESTING A REVIEW

Environmental reviews may be requested by the chief elected officials of a municipality or the chairman of town commissions such as planning and zoning, conservation, inland wetlands, parks and recreation or economic development. Requests should be directed to the Chairman of your local Soil and Water Conservation District. This request letter should include a summary of the proposed project, a location map of the project site, written permission from the landowner allowing the Team to enter the property for purposes of review, a statement identifying the specific areas of concern the Team should address, and the time available for completion of the ERT study. When this request is approved by the local Soil and Water Conservation District and the Eastern Connecticut RC&D Executive Council, the Team will undertake the review on a priority basis.

For additional information regarding the Environmental Review Team, please contact Elaine A. Sych (774-1253), Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, P.O. Box 198, Brooklyn, Connecticut 06234.