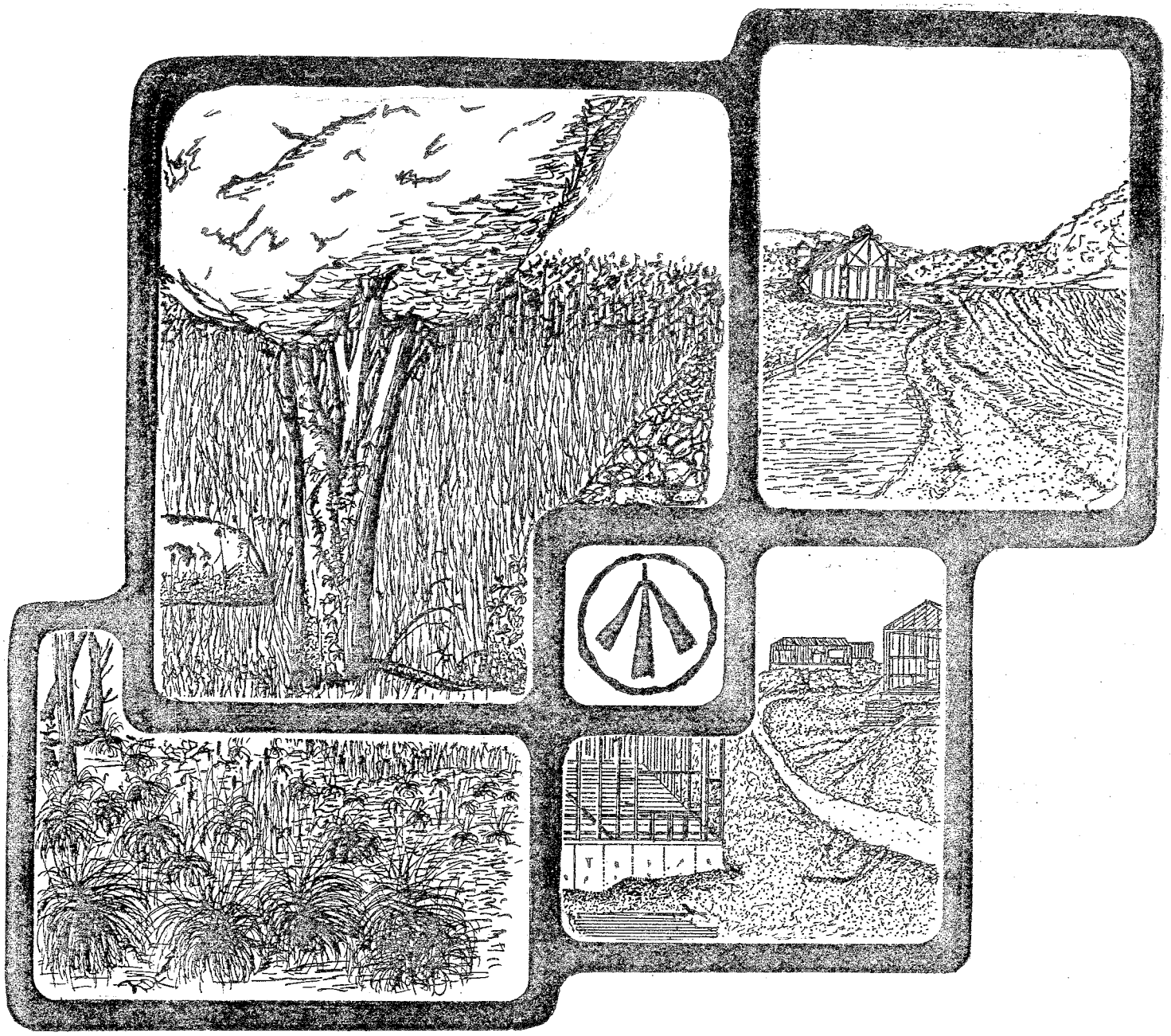
ENVIRONMENTAL REVIEW TEAM REPORT



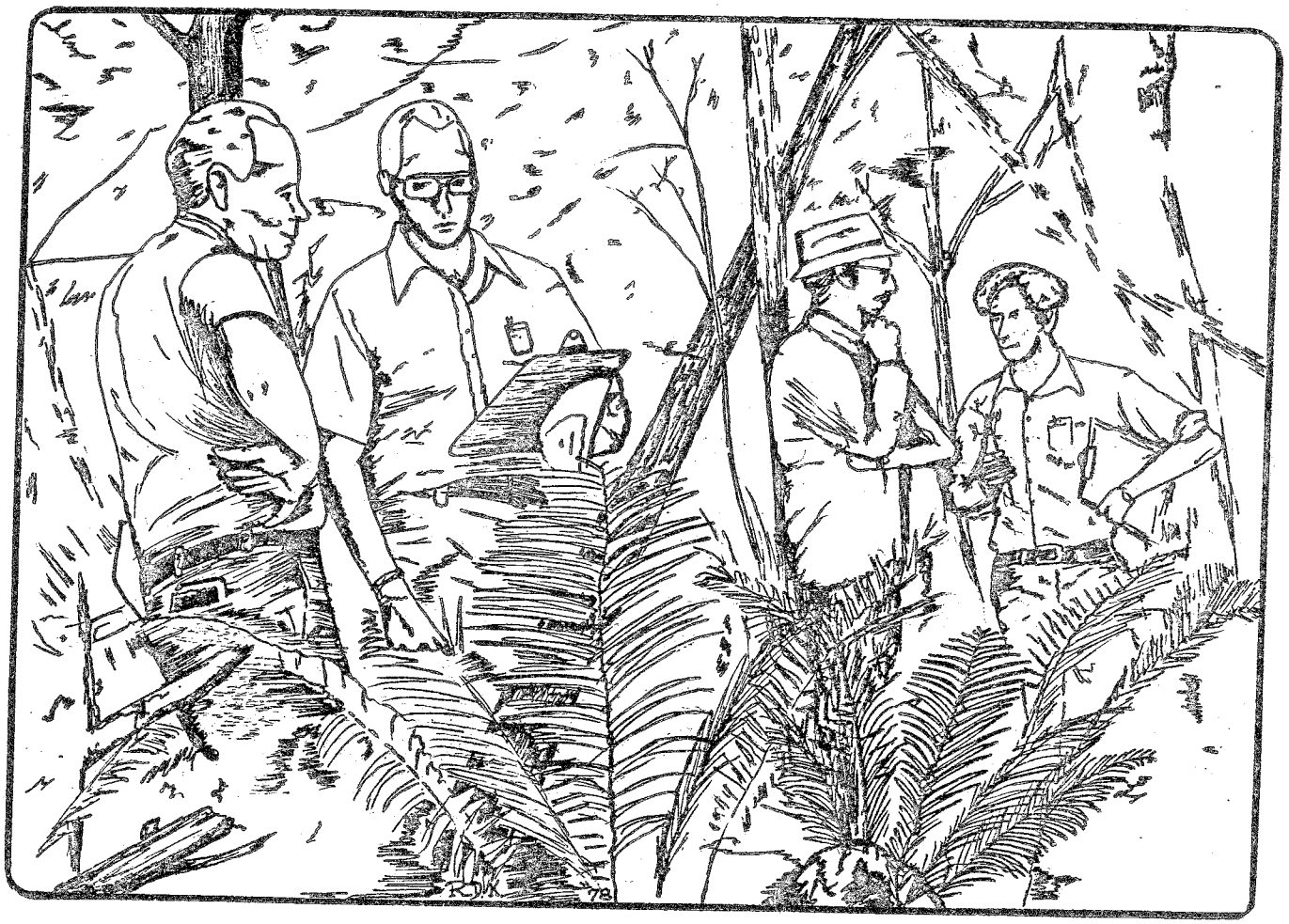
HAWLEYVILLE COMPANY INDUSTRIAL SUBDIVISION
NEWTOWN, CONNECTICUT

KING'S MARK
RESOURCE CONSERVATION & DEVELOPMENT AREA

KING'S MARK
ENVIRONMENTAL REVIEW TEAM REPORT

ON

HAWLEYVILLE COMPANY INDUSTRIAL SUBDIVISION
NEWTOWN, CONNECTICUT



DECEMBER 1980

King's Mark Resource Conservation and Development Area

Environmental Review Team

P. O. Box 30

Warren, Connecticut 06754

ACKNOWLEDGMENTS

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

Federal Agencies
U.S.D.A. SOIL CONSERVATION SERVICE

State Agencies
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DEPARTMENT OF HEALTH
DEPARTMENT OF TRANSPORTATION
UNIVERSITY OF CONNECTICUT COOPERATIVE EXTENSION SERVICE

Local Groups and Agencies
LITCHFIELD COUNTY SOIL AND WATER CONSERVATION DISTRICT
NEW HAVEN COUNTY SOIL AND WATER CONSERVATION DISTRICT
HARTFORD COUNTY SOIL AND WATER CONSERVATION DISTRICT
FAIRFIELD COUNTY SOIL AND WATER CONSERVATION DISTRICT
NORTHWESTERN CONNECTICUT REGIONAL PLANNING AGENCY
VALLEY REGIONAL PLANNING AGENCY
LITCHFIELD HILLS REGIONAL PLANNING AGENCY
CENTRAL NAUGATUCK VALLEY REGIONAL PLANNING AGENCY
HOUSATONIC VALLEY COUNCIL OF ELECTED OFFICIALS
AMERICAN INDIAN ARCHAEOLOGICAL INSTITUTE

x x x x x x

Funding Provided By

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

Policy Determined By

KING'S MARK RESOURCE CONSERVATION AND DEVELOPMENT AREA

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

Staff Administration Provided By

NORTHWESTERN CONNECTICUT REGIONAL PLANNING AGENCY

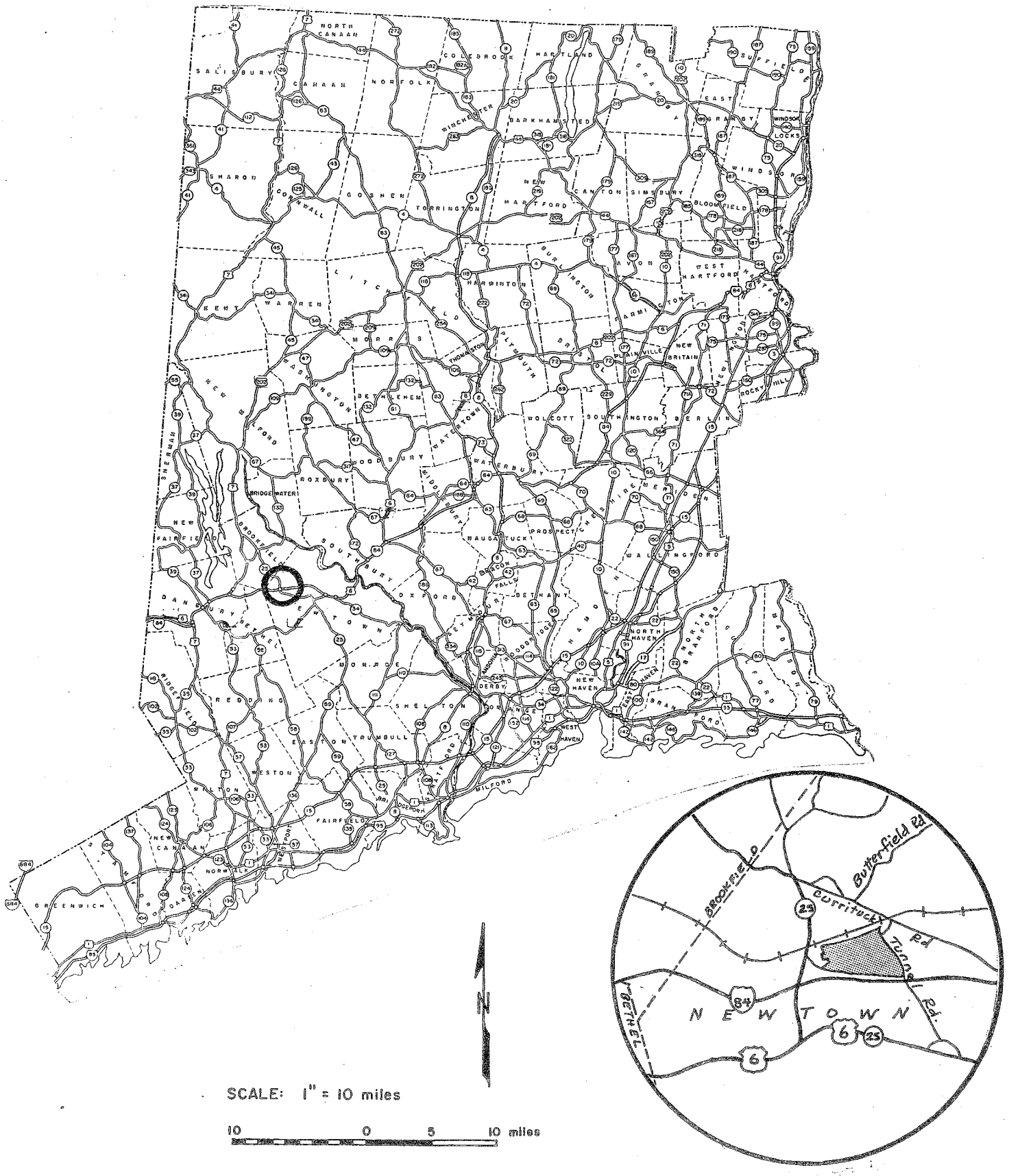
Leicester H. Handsfield, Chairman
Charles A. Boster, Director
Richard Lynn, ERT Coordinator
Rebecca West, ERT Cartographer
Irene Nadig, Secretary
Brenda Lloyd, Secretary

TABLE OF CONTENTS

LIST OF FIGURES

LOCATION OF STUDY SITE

HAWLEYVILLE COMPANY INDUSTRIAL SUBDIVISION
NEWTOWN, CONNECTICUT



ENVIRONMENTAL REVIEW TEAM REPORT

ON

HAWLEYVILLE COMPANY INDUSTRIAL SUBDIVISION

I. INTRODUCTION

The Newtown Conservation Commission is presently reviewing an application for industrial subdivision of ± 94 acres of land. The subject site is located in the northwestern quarter of town just north of I-84 and east of Rte. 25. Direct access to the parcel is available from the south and east via Barnabas Road and Tunnel Road, respectively. A Penn Central Railroad Line abuts the northern border of the property.

The Hawleyville Company property consists of wooded land and open fields. Slopes on the property range from moderate to steep (see Figure 1). According to USGS mapping, the site is traversed by one perennial stream and one intermittent stream. There are approximately 15 acres of wetlands on the property according to a soils consultant for the developer.

The subdivision plan for the property calls for seven industrial lots of 10+ acres in size (see Figure 2). Each lot would be served by an individual well and subsurface sewage disposal system. One new road of ±1450 feet would be constructed as part of this project to service the five eastern-most lots. Drainage from this road would be directed to the wetland in the northeastern corner of the property.

The Newtown Conservation Commission requested the assistance of the King's Mark Environmental Review Team to help the town in analyzing the proposed project. Specifically the Team was asked to prepare a report discussing the opportunities and limitations of the subject site for industrial development. Of major concern to the Conservation Commission are: the suitability of the soils for the proposed land use, the impact of the project on inland wetlands, and the possibility of pollution with industrial use of the land.

The ERT met and field reviewed the site on October 8, 1980. Team members for this review consisted of the following:

Brian Curtis.....Sanitary Engineer.....Connecticut Department of Environmental Protection

Ken Faroni.....Regional Planner.....Housatonic Valley Council of Elected Officials

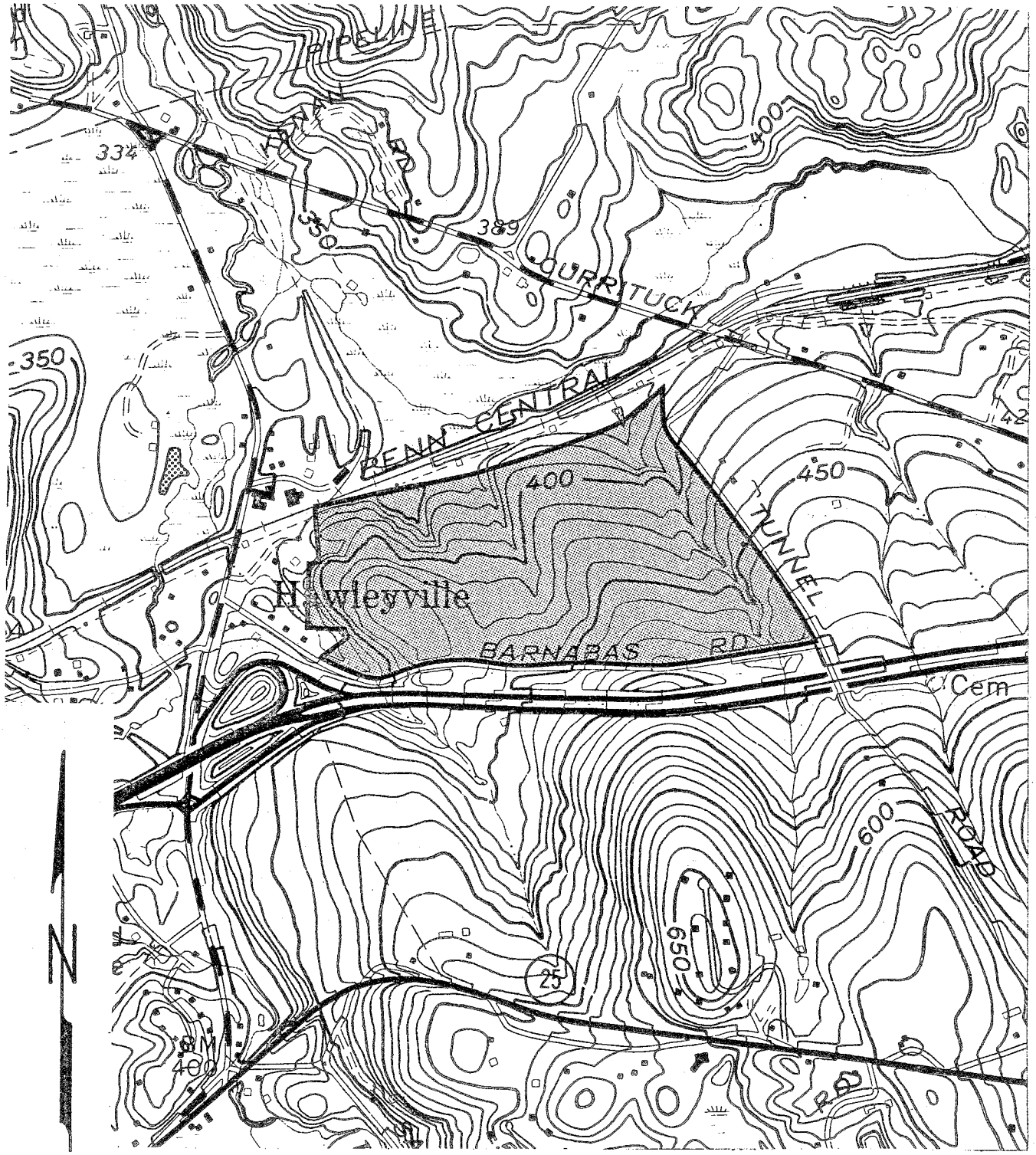
Robert Rocks .....Forester.....Connecticut Department of Environmental Protection

David Thompson.....District Conservationist.....U.S.D.A. Soil Conservation Service

Mike Zizka.....Geohydrologist.....Connecticut Department of Environmental Protection

FIGURE I.

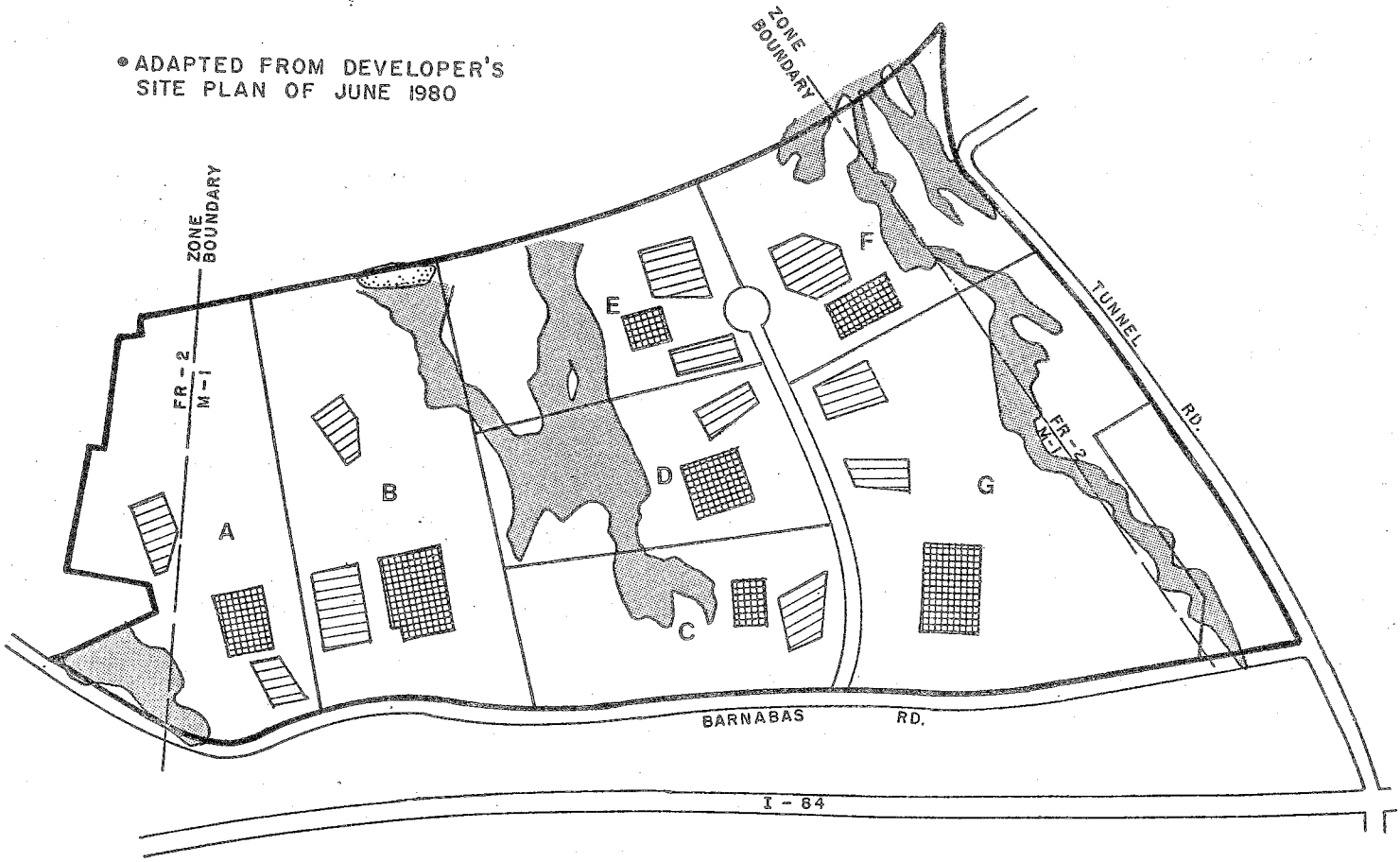
TOPOGRAPHIC MAP



SCALE: 1" = 1000'

FIGURE 2.

SIMPLIFIED SITE PLAN



SCALE: 1" = 500'

EXPLANATION

E — LOT

FEASIBLE INDUSTRIAL BUILDING SITE

FEASIBLE SUBSURFACE SEWAGE DISPOSAL SITE

WETLAND (FIELD REVISED)

POND

Prior to the review day, each team member was provided with a summary of the proposed project, a checklist of concerns to address, a detailed soil survey map, a soils limitation chart, a topographic map, and a simplified site plan of the development proposal. Following the field review, individual reports were prepared by each team member and forwarded to the ERT Coordinator for compilation and editing into this final report.

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

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

* * * * * * * *

II. SUMMARY

- Overlying bedrock on most of the site is a variably thick mantle of glacial sediment known as till. On the steep slopes in the western section of the property, the till probably averages less than 10 feet in thickness; on the rest of the site, the average till thickness probably exceeds 10 feet.

- Development of the site as planned would cause surface runoff and peak flows in local stream courses to increase. The greatest increases would appear to occur in the stream course that exits the site through a swamp-pond about 500 feet east of the northwest corner. Peak flow increases in the stream are expected to be only moderate however for the larger storm events (i.e. less than 10% increase for 25-year, 50-year, and 100-year streams). Whereas there would be an increased erosion potential, it seems unlikely that any significant adverse flooding effects would be experienced downstream of the site, particularly in view of the existing basin at the outlet from the site.

- The present subdivision plan indicates that no encroachment on or filling of the wetland would take place. The effectiveness of the wetlands in peak-flow reduction should, therefore, be unimpeded by the development.

- In light of the surficial geology of the site, it seems probable that bedrock would be the most practical aquifer for on-site wells. Based upon statistical data, it would appear that sufficient water could be obtained from the site to support industries with low water demands (2000 gallons per day or less). The initial quality of the ground water should be good. Future ground water quality would depend upon the satisfactory design and installation of septic systems and on the protective measures used to prevent introduction of salts or industrial wastes into the soils.

- The predominant soils on the property are upland soils over compact glacial till. The major soil related consideration on this site is the fragipan in the Paxton and Woodbridge soils. The fragipan will cause a seasonal, perched water table and careful engineering will be required to prevent the drowning of septic system leachfields, wet basements, and water seepage on cut slopes.

- The proposed provisions for erosion and sediment control during the construction of the access road are adequate. Proposals for individual lot development should also include plans for effective erosion and sediment control.

- The open space proposal paralleling I-84 is valuable only as a buffer between the highway corridor and the property. The open space area fronting on Tunnel Road has potential as a recreational area. The possibility exists for two ball fields. The site will require extensive drainage improvements and regrading to accommodate this use however.

- Five major vegetation types occupy the subject site. A fuelwood thinning in the western portion of the property would be desirable. The impact of the proposed project on wetland vegetation should be slight is appropriate erosion and sediment controls are implemented and the wetlands are

not directly disturbed. The soils underlying the Hawleyville site generally have excellent potential for landscaping.

- *Based upon available information, it appears the soils on this site are capable of handling sewage flows of approximately 2000 gallons per day per site. If the groundwater in this area is classified as GAA or GA, as anticipated, the only wastewater suitable for discharge to the ground is domestic sewage on wastes which readily biodegrade in the soil-groundwater system.*

- *Advisory state and local plans are generally in accord with the proposed use of this land. Barnabas Road will likely require upgrading to handle the increased traffic from the project.*

- *With the possible exception of printing and publishing establishments, permitted uses as promulgated in the zoning regulations do not appear to present major problems in terms of possible contamination. Nevertheless there are aspects of industrial development which could present a threat to ground and surface water quality. Not all of these aspects are regulated by state or federal programs. Therefore, the importance of critical site plan review by the town of each proposed firm/lot cannot be overemphasized.*

III. GEOLOGY

The Hawleyville Company property is located in an area encompassed by the Newtown topographic quadrangle. A bedrock geologic map of the quadrangle, by R. S. Stanley and K. G. Caldwell, has been published by the Connecticut Geological and Natural History Survey (Quadrangle Report No. 33). Bedrock underlying and cropping out on the site is identified as part of the Brookfield Gneiss formation. This rock unit is dark gray to black with white spots, is medium - to coarse-grained, and is composed largely of the minerals quartz, hornblende, plagioclase, biotite, magnetite, chlorite, and shene. Small exposures of bedrock and numerous boulders are present on the steeply sloped area near the western boundary of the property.

Overlying bedrock on most of the site is a variably thick mantle of glacial sediments. These sediments include rock particles of widely ranging sizes and shapes. Little or no sorting by grain size is evident, and the particles generally have angular shapes. The sediments were deposited directly from glacier ice and are collectively called "till". Typically, the upper one to three feet of till are sandy, very stony, and somewhat friable. Below that zone, the till generally becomes siltier,less stony, and tightly compact. On the steep slopes in the western section of the property, the till probably averages less than 10 feet in thickness; on the rest of the site, the average till thickness probably exceeds 10 feet.

IV. HYDROLOGY

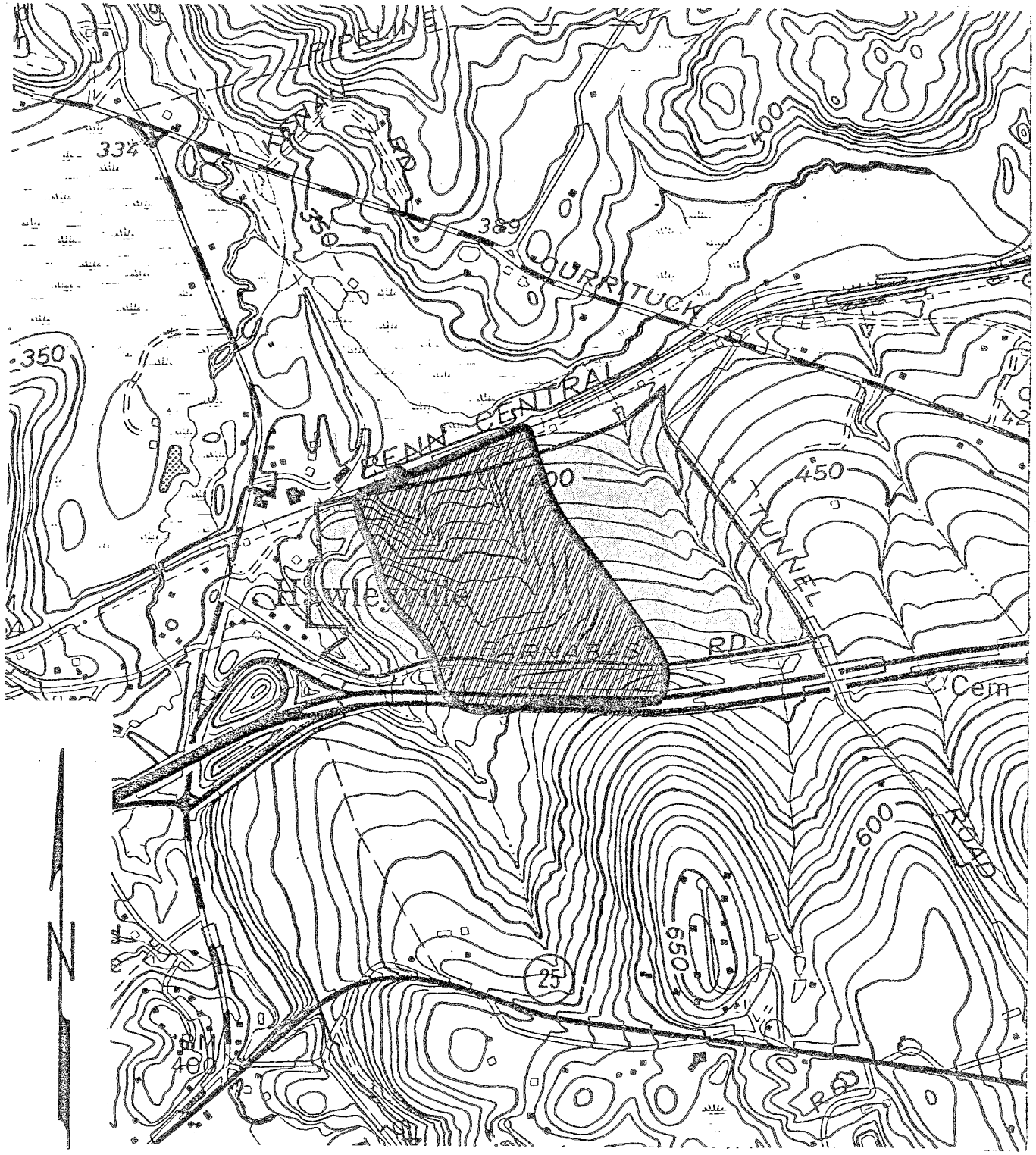
Drainage flows north - northwest through the site. Several swales carrying intermittent flows divide the property. None of the swales carries water year-round; although the eastern most channel is characterized as a perennial stream on the topographic map, it was dry at the time of the field review.

Despite the seasonal nature of surface flows on the site, the stream courses may occasionally carry significant volumes of water. This is a result of the relatively heavy amounts of rainfall to which the Newtown area is subject. Maps prepared by the Water Resources Division of the U.S.Geological Survey show that the Newtown - Oxford - Middlebury area receives among the greatest amounts of precipitation in the state during major storm events.

Development of the site as planned would cause surface runoff and peak flows in local stream courses to increase. There are several methods by which the present runoff volumes and peak flows and the potential future increases can be estimated. Using the SCS runoff curve-number method, as described in "Flood Flow Formulas for Connecticut", a technical paper by Paul Biscuti of the Department of Environmental Protection, the Team has estimated present and potential future drainage parameters for the stream course that exits the site through a swamp-pond about 500 feet east of the northwest corner. The overall drainage area of the stream course is shown in figure 3. The two other drainage channels crossing the site have larger watersheds and only one or two lots would be created in each. Although some discrete runoff increases would still occur in these latter watersheds, the increases would be too small to be adequately estimated under the SCS method. It should also to noted that the various methods used in estimating

FIGURE 3.

Watershed of the swamp-pond at the northern boundary of the site



runoff and peak flows may produce significantly different results. For these reasons, the estimates given below should be viewed more as indicators of the magnitude of the anticipated increases than as indicators of the exact peak flow and runoff rates to be expected.

Peak flows and runoff volumes were estimated for the 25-year, 50-year, and 100-year storms. These storms have, respectively, a four-percent, two-percent, and one-percent chance of occurring in any given year. Peak flows are given in cubic feet per second (cfs); runoff volumes are given in inches of overall depth.

PEAK FLOWS

	25-year storm	50-year storm	100-year storm
Present	192 cfs	271 cfs	371 cfs
Future	210 cfs	295 cfs	401 cfs
Percent Increase	9%	9%	8%

RUNOFF VOLUMES

Present	4.21 inches	5.70 inches	7.55 inches
Future	4.42 inches	5.95 inches	7.82 inches
Percent Increase	5%	4%	4%

The increases estimated above are based on an assumption that one acre of impermeable surfaces (roofs, parking lots,etc.) would be created for each lot and the remainder would remain vegetated. If more or less impermeable surface area is actually created, the estimates would be respectively greater or less for future parameters. The estimates given above reflect a potential for only moderate increases in peak flows and runoff. Whereas there would be an increased erosion potential, it seems unlikely that any significant adverse flooding effects would be experienced downstream of the site, particularly in view of the existing basin at the outlet from the site.

Apart from the swamp-pond mentioned above, the wetlands as presently mapped on the site consist of fairly flat swales adjacent to the seasonal streamcourses. As such, the wetlands have a limited runoff-storage potential that serves to reduce by at least a slight amount the peak flows in the streams. It does not appear that these wetlands serve any other significant hydrologic functions. The present subdivision plan indicates that no encroachment on or filling of the wetlands would take place. The effectiveness of the wetlands in peak-flow reduction should therefore be unimpeded by the development.

V. WATER SUPPLY

On-site wells are proposed to serve the industrial occupants of the subdivision. In light of the surficial geology of the site, it seems probable that bedrock would be the most practical aquifer. Groundwater yields from a bedrock aquifer depend upon the number and size of water-bearing fractures that an individual well intersects. Unfortunately, the distribution of such fractures in the rock may be highly variable and is generally incapable of prediction. For this reason, it is not practical to attempt to assess specific

areas within the site for water production. However, Connecticut Water Resources Bulletin No. 21 provides statistical data that allows an estimate of the chances of achieving certain yields in wells on the site.

The developer's stated desire is to attract industrial occupants with low (2000 gallons per day or less) water demands. The major reason for this approach is to respect the limitations that the till soils with their seasonally high water tables place on septic system development. Assuming adequate storage volumes, either in the well shaft or in accessory tanks, a 2000 gpd demand could be satisfied by a well yielding 1.5 - 2.0 gallons per minute. From the statistical data mentioned above, it may be estimated that a well drilled at any given location should have at least a 90-percent chance of realizing such a yield. The chances of achieving a 5 gpm yield would be less than 70 percent; a 10 gpm yield, less than 50 percent; and a 50 gpm yield, less than 5 percent.

The initial quality of the ground water should be good, although there is a slight chance that iron, manganese, or other elements may be present in objectionable amounts. Future groundwater quality would depend upon the satisfactory design and installation of septic systems and on the protective measures used to prevent introduction of salts or industrial wastes into the soils.

VI. SOILS

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

SOIL CHARACTERISTICS:

There are five soil types on the property. They represent the following four natural soil groups.

Upland soils over friable to firm glacial till.
Upland soils over compact glacial till.
Upland soils rocky and shallow to bedrock.
Marsh and swampy soils.

The predominant soils on the property are in the second group (upland soils over compact glacial till).

SOIL DESCRIPTIONS:

Natural Soil Group - Upland soils over friable to firm glacial till.

Soil name - Sutton fine sandy loam.

Soil Identification 41-B

This is a moderately well drained upland soil developed in very friable to firm glacial till. Surface soil and subsoil texture to a depth of 20 to 30 inches is fine sandy loam with some small, angular rock fragments. The under lying material is sandy loam or fine sandy loam with many stones and gravel size rock fragments in places. The lower subsoil is mottled indicating waterlogging. A fluctuating water table is sometimes within 15 to 20 inches of the surface during winter and early spring. This soil is moderately permeable throughout, but slowly permeable layers may be present below 36 inches in places. Stones and boulders have been removed from the surface of this soil on this site. Sutton soils are members of the drainage sequence that includes the well drained Charlton and poorly drained Leicester soils.

Natural Soil Group - Upland soils over compact glacial till.

Soil Name- Paxton fine sandy loam

Soil Identification -35B-35C

35B:

Paxton fine sandy loam, 3 to 8% slopes: This is a gently sloping, well drained, upland soil with a slowly to very slowly permeable fragipan at about 24 to 30 inches in depth. The surface soil and subsoil texture above the fragipan is very friable or friable fine sandy loam. The compact fragipan restricts internal drainage. There may be a perched water table above the fragipan in the winter season and after heavy rains. The excess water may move downslope over the fragipan in wet seasons and cause seeps on lower slopes. Paxton soils are members of a drainage sequence that includes the moderately well drained Woodbridge, poorly drained Ridgebury, and the very poorly drained Whitman soils. Surface stones and boulders have been removed from this soil on this site.

35C:

Paxton fine sandy loam, 8-15% slopes: This sloping, well drained upland soil has a slowly to very slowly permeable fragipan at about 24 to 30 inches in depth. The surface soil and subsoil texture above the fragipan is very friable or friable fine sandy loam. The compact fragipan restricts internal drainage. A perched water table may occur above the fragipan in wet seasons and after heavy rains. The water often moves downslope over the fragipan in wet seasons. Paxton soils are members of a drainage sequence that includes the moderately well drained Woodbridge, poorly drained Ridgebury, and the very poorly drained Whitman soils. Surface stones and boulders have been removed from this soil on this site.

Soil Name - Woodbridge:

Soil Identification - 31B-31XB-31MB

31B:

Woodbridge fine sandy loam, 3 to 8 percent slopes. This is a moderately well drained soil on gentle slopes. It has a slowly to very slowly permeable fragipan at about 24 inches in depth. Surface soil and subsoil texture above the fragipan is friable or very friable fine sandy loam. The lower part of the subsoil is mottled indicating a water-logged condition from late fall until early spring and after heavy rains in summer. This soil is moderately permeable above the very firm fragipan which restricts internal drainage. Water may move downslope over the fragipan in wet seasons. This soil is a member of the drainage sequence that includes the well drained Paxton, poorly drained Ridgebury, and the very poorly drained Whitman soils.

31XB:

Woodbridge stony fine sandy loam, 3-8% slopes. This is a moderately well drained soil with a slowly or very slowly permeable fragipan at about24 inches in depth. It has 0.1 to 3 percent of the surface covered with stones or boulders. Surface soil and subsoil texture above the fragipan is friable or very friable fine sandy loam. The lower part of the subsoil is mottled indicating a waterlogged condition from late fall until spring and after heavy rains in summer. This soil is moderately permeable above the very fine fragipan which restricts internal drainage. Water may move downslope over the fragipan in wet seasons and cause seeps on lower slopes. This soil is a member of the drainage sequence that includes the well drained Paxton, the poorly drained Ridgebury, and the very poorly drained Whitman soils.

31MB:

Woodbridge very stony fine sandy loam, 3-15% slopes. This is a moderately well drained soil with a slowly or very slowly permeable fragipan at about 24 inches in depth. It has more than 3 percent of the surface covered with stones or boulders. Surface soil and subsoil texture above the fragipan is friable to very friable silt loam. The lower part of the subsoil is mottled indicating a water-logged condition from late fall until spring and after heavy rains in summer. This soil is moderately permeable above the compact and very firm fragipan which restricts internal drainage. Water commonly moves downslope over the fragipan in wet seasons. Woodbridge is a member of the drainage sequence that includes the well drained Paxton, the poorly drained Ridgebury, and the very poorly drained Whitman soils.

Natural Soil Group - Upland soils - Rocky and Shallow to bedrock.

Soil Name - Hollis - Charlton Complex

Soil Identification - 17MC-17MD.

17MC:

Hollis extremely rocky fine sandy loam, 3 to 15 percent slopes. This shallow soil is less than 20 inches to the underlying bedrock. It is somewhat excessively drained. Bedrock outcrops are numerous and surface stones and boulders are present in most places. This soil is very friable fine sandy loam and is moderately permeable above the bedrock. The gently sloping and sloping topography is mostly irregular.

17MD:

Hollis extremely rocky fine sandy loam, 15-30% slopes. This moderately steep and steep soil is less than 20 inches deep over bedrock. It is somewhat excessively drained. Bedrock outcrops are numerous and surface stones and boulders are present in most places. This soil is very friable or friable fine sandy loam and is moderately permeable above the bedrock.

Natural Soil Group - Marsh and Swampy soils.

Soil Name: Ridgebury

Soil Identification - 98

Ridgebury fine sandy loam. This is a nearly level poorly drained soil with a slowly to very slowly permeable fragipan at depths of about 24 inches. Surface soil and subsoil texture above the fragipan is friable or very friable fine sandy loam. The subsoil has gray mottled colors which indicate a waterlogged condition from fall until spring and after heavy summer rains. The permeability above the fragipan is moderate. Water may move downslope over the fragipan during wet seasons. This soil is a member of the drainage sequence that includes the well drained Paxton, moderately well drained Woodbridge, and the very poorly drained Whitman soils.

Soil Name - Leicester, Ridgebury and Whitman

Soil Identification - 43M

Leicester, Ridgebury and Whitman very stony fine sandy loams. This very stony mapping unit includes poorly and very poorly drained soils. These soils occur in such an intricate and complex pattern that the separation of each individual soil was not possible on the scale of map that was used. These soils have a water table at or near the surface from fall to spring and after heavy rains during the summer.

SOIL RELATED CONSIDERATIONS:

All of the proposed structures are located on deep glacial till soils. Of the eleven potential septic system sites, nine are on well drained sites and two are on moderately well drained sites.

The major soil related consideration on this site is the fragipan in the Paxton and Woodbridge soils. Coping with the seasonal, perched watertable is not an insurmountable problem however. Techniques used to mitigate the limitation are simple and effective. The Newtown Health Code presently has provisions specifically designed to provide safeguards in the design and construction of septic systems in fragipan soils.

Other soil related considerations include the need for footing drains around building foundations, and the use of curtain drains to divert subsurface seepage from cut slopes.

Erosion & Sediment Control:

The development plan outlines and illustrates adequate provisions for erosion and sediment control during the construction of the access road.

The need for erosion and sediment control measures can be anticipated on all of the proposed lots. Although none of the lots present significant hazards, all proposals should include erosion and sediment control plans.

Open Space:

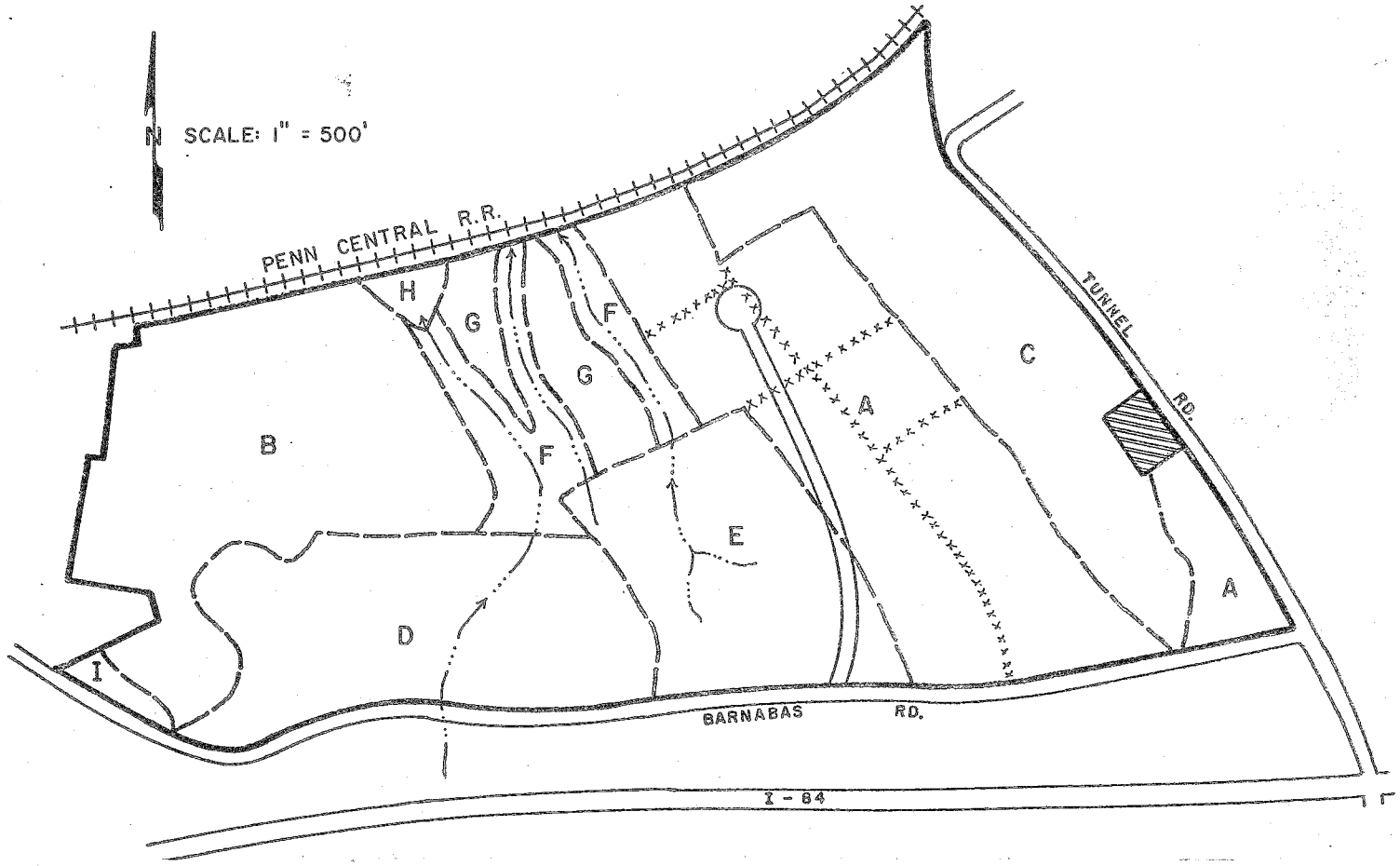
The open space proposal paralleling I-84 is valuable only as a buffer between the highway corridor and the property. The open space area fronting on Tunnel Road has potential as a recreational area. The possibility exists for two ball fields. The site will require extensive drainage improvements and regrading to accommodate this use however.

VII. VEGETATION

The property proposed for development into "Hawleyville Company Industrial Subdivision" may be divided into five major vegetation types. These include four mixed hardwood stands which total 51± acres, open fields totaling 23± acres, old fields which total 17± acres, open swamp 1± acre, and a harwood swamp totaling 1± acre. Figure 4 shows the location of these vegetation types. A description of each vegetation type is presented in the following section.

FIGURE 4.

VEGETATION TYPE MAP



LEGEND

- ROAD
- RAIL ROAD
- PROPERTY BOUNDARY
- VEGETATION TYPE BOUNDARY
- STREAM
- RESIDENCE 1± ACRE
- ××××× VEGETATION FENCE ROWS BETWEEN FIELDS

VEGETATION TYPE DESCRIPTION*

TYPE A Open field. 23± acres.

TYPE B Mixed hardwoods. 19± acres fully-stocked, pole with occasional sawtimber.

TYPE C Mixed hardwoods. 17± acres. Two aged, fully-stocked, sapling & sawtimber.

TYPE D Old field. 13± acres. Under-stocked, seedling to sapling size.

TYPE E Mixed hardwoods. 11± acres. Over-stocked, seedling to sapling size.

TYPE F Mixed hardwoods/streambelt. 5± acres. Fully to over-stocked, pole to sawtimber size.

TYPE G Old field/wetland. 4± acres. Under-stocked, seedling size.

TYPE H Open swamp. 1± acre.

TYPE I Hardwood swamp. 1± acre. Over-stocked, seedling to sapling size.

*Seedling size - Trees less than 1 inch in diameter at 4½ ft. above the ground (d.b.h.)
Sapling size - Trees 1 to 5 inches in d.b.h.
Pole size - Trees 5 to 11 inches in d.b.h.
Sawtimber size - Trees 11 inches and greater in d.b.h.

Vegetation Type Descriptions

TYPE A. OPEN FIELD. Twenty three acres of open fields are present on this property. Some of these fields are used in the production of corn, while others are vegetated with grasses and occasional goldenrod and black eyed susan. The fence rows which traverse these fields are vegetated with sapling and pole-size red maple, american elm, white ash, black cherry, mockernut hickory and sassafras. Shrub species present include flowering dogwood, red osier dogwood, and barberry. Dense patches of poison ivy and raspberry are located within these fence rows.

TYPE B. MIXED HARDWOODS. This 19± acre fullystocked stand is made up of medium quality pole-to sawtimber-size red oak, black oak, white oak and occasional black birch, red maple, pignut hickory, sugar maple and american beech. The trees in this stand are just beginning to decline in vigor. The understory is dominated by blue beech, maple leaved viburnum and hardwood tree seedlings. Grasses, huckleberry, christmas fern, wild sarsaparilla and club moss form the ground cover in this stand.

TYPE C. MIXED HARDWOODS. Sapling and sawtimber-size sugar maple, red maple, shagbark hickory, american beech, black birch and scattered american elm are present in this two-aged fullystocked stand which totals approximately 17 acres. Spice bush, witchhazel, blue beech and maple leaved viburnum are present in the understory. Sugar maple and white ash seedlings form the ground cover in this area, along with poison ivy, virginia creeper, wild onion, wild sarsaparilla, christmas fern and clubmoss.

TYPE D. OLD FIELD. This 13 ± acre old field area is under-stocked with seedling to sapling-size black oak, white oak, red oak, red maple, black birch, gray birch, quaking aspen, eastern red cedar and sassafras. The shrub species which are present include gray stemmed dogwood, red osier dogwood, deciduous holly and arrow wood. Steeplebush, sweet fern, spreading dogbane, aster, golden rod, wild strawberry and grasses are also present.

TYPE E. MIXED HARDWOODS. Seedling to sapling size red maple, sugar maple, white ash and american elm are present in this 11 ± acre over-stocked stand. Hawthorn and highbush blueberry are scattered throughout this stand. Ground cover vegetation is sparse, however where sunlight does reach the forest floor, grasses, cinquefoil and wild geranium have become established. Sensitive fern, sedges and sphagnum moss are present where the stream passes through this stand.

TYPE F. MIXED HARDWOODS/STREAM BELT. There are approximately 5 acres of stream belt areas which are vegetated by pole to sawtimber size sugar maple, black birch, white ash and shagbark hickory. Sugar maple seedlings and spice bush dominate the understory in these areas. Skunk cabbage, sedges, christmas fern, poison ivy, wild ginger, and wild sarsaparilla form the ground cover in this area.

TYPE G. OLD FIELD/WETLAND. This 4 ± acre area is understocked with seedling-size red maple, white ash and american elm. Shrub species include gray stemmed dogwood, red osier dogwood, silky willow and arrowwood. Ground cover consists of grasses, sedges, goldenrod, Joe-pye-weed, spirea and sensitive fern.

TYPE H. OPEN SWAMP. The vegetation present in this one acre open swamp is dominated by tussock sedge, skunk cabbage and sphagnum moss.

TYPE I. HARDWOOD SWAMP. This one acre area is overstocked with seedling to sapling-size red maple along with occasional american elm and white ash. Ground cover in this area is made up of skunk cabbage, false hellebore tussock sedge and sphagnum moss.

Impact of Road Drainage and Sheet Runoff on Wetlands.

Road drainage and sheet runoff will have little effect on the wetland vegetation as long as no part of the wetland is filled. Wetland filling could cause drainage ways to be blocked or restricted, resulting in an unnatural build up or ponding of water.

Blocking or restricting natural flows such that water ponds over vegetation roots may cause vegetation mortality. It is a good practice to avoid any alterations of normal drainage patterns that will cause water to pond over tree roots.

Road drainage carrying deicing salts may have an impact on the health of wetland vegetation. The chemicals commonly used (sodium chloride and calcium chloride) for the deicing of roads are toxic to trees. Some species are more intolerant of these salts than others. The maples, hickories, pines and hemlocks are very susceptable to salt injury, while the birches, oaks, aspen, and ashes are not.

Little is actually known about the total effect which deicing salts have on wetlands. It is known, however, that the concentration of salt, distance the salt travels before reaching the wetland, type of wetland, size of wetland, and volume of flow through the wetland all play a part in the impact of deicing salts. Sedimentation of wetland areas may also be injurious to tree health and vigor. Therefore, it is important that proper erosion control practices be implemented during and after construction to safeguard against accelerated erosion and subsequent siltation.

Value of Wetlands

The wetlands which are present within this tract are the areas that are directly adjacent to streams, where soils are somewhat poorly drained. These stream belt areas support for the most part large, tall healthy trees and/or luxurious under story and ground cover vegetation. When left relativitly undisturbed, these areas act as buffer strips which help to keep stream water quality high. The vegetation in these areas

provide shade for streams, keeping water temperatures low, and act as a filter which aids in trapping silt and sediment. These areas also provide corridors which are utilized by many species of wildlife for cover, hunting, breeding and traveling between other habitat types. The proposed project is not expected to have a significant impact on these wetland functions if appropriate erosion and sedimentation controls are implemented and wetlands are not directly disturbed. The project can be expected to lower wildlife values to an extent due to the increased presence in the area.

Limiting Conditions

Few conditions limit the potential for design and maintenance of vegetative cover over most of this tract. In fact the majority of the soils are among Connecticuts best for growing trees and other vegetation.

The soils present within vegetation type B (mixed hardwoods) do, however, limit vegetation growth potentials. These soils are very stony, shallow to bedrock and excessively drained. The trees present in this area are somewhat slow growing, because of the lack of adequate moisture during the spring growth season when the demand for water is highest. The large rocks and shallow to bedrock soils limit the depth of tree root systems, which results in high windthrow potentials as trees are unable to become securely anchored.

The saturated soils present in vegetation type H (open swamp) and vegetation type I (hardwood swamp) limit vegetation to species which are tolerant of excessive moisture conditions. Where standing water is present for a better part of the year, tree species are unable to become established. Where trees do become established they are generally slow growing and of poor quality.

Suggested Management Practices

The trees in vegetation type B (mixed hardwoods) are beginning to become crowded and as a result are declining in health and vigor. A thinning in this stand to reduce the crowded condition would improve the health and stability of the trees in this stand over time.

The trees in this stand are not large enough to be marketed as sawtimber without reducing stocking levels to well below acceptable limits.

A fuelwood thinning, however, utilizing the "Crop Tree Selection Method" would reduce the competition between residual trees for space, sunlight, water and nutrients , and result in a healthier forest over time.

Under the "Crop Tree Selection Method", 100 of the highest quality trees in each acre should be identified (trees spaced about 20' x 20' will equal 100 trees per acre) and one to three trees that are in direct competition with each of those identified should be removed. The 100 trees per acre that are selected as crop trees should be healthy, large crowned, and show

little or no signs of serious damage. Trees which are not competing with the 100 selected trees should not be removed, unless they are severely damaged. This thinning, if implemented, should provide between 4 and 5 cords of fuelwood per acre.

If the above thinning is agreed to, a consultant forester or public service forester should be contacted to help select crop trees and mark the trees that are to be removed.

Trees which are cleared for construction purposes on this site should be utilized as fuelwood whenever possible.

VIII. SEWAGE DISPOSAL AND WATER QUALITY CONSIDERATIONS

Suitability of Soils for On-Site Subsurface Sewage Disposal.

In the opinion of the Team's sanitary engineer, Mr. Michael F. Miller's report to the Newtown Conservation Commission dated September 25, 1980 addresses the subject of subsurface sewage disposal rather accurately and completely. The soils identified on parcels A-G have been mapped by the Soil Conservation Service as Hollis extremely rocky fine sandy loam, Woodbridge very stony fine sandy loam and Paxton fine sandy loam. The Woodbridge and Paxton soils are moderately well to well drained soils with a seasonally high ground water table due to the occurance of a compact substratum. The Hollis soils are somewhat excessively drained but are of limited use due to the occurance of shallow depths to ledge. Mr. Miller has indicated that on-site soils would have a hydraulic capacity of approximately 2,000 gallons per day of sewage for each lot. Based upon available information, it appears that this is a reasonable figure for the upper limit of the sites capacities. However, there are several requirements which should be considered if this quantity of sewage is to be properly disposed of on each lot.

a. Final determination of the capacity and limitation of each lot should be based upon detailed site testing conducted by Newtown health officials.

b. Upgradient curtain drains or drainage swales should be considered for use to employ the maximum hydraulic capacity of the soils for the transmission of leachfield effluent.

c. The systems should be designed and laid out so that the leaching fields extend as far as possible along the contour. If the leachfield for a particular site has the distribution pipes stacked one line above another all the way up slope rather than spreading them out along the slope, hydraulic capacity could be exceeded and result in failure.

d. The leachfield should be arranged to take advantage of the more permeable subsoil rather than the compact substratum.

It may be that due to the occurance of shallow depths to ledge on portions of sites A and B difficulties may arise in obtaining the proper layout of the leachfields. Detailed site testing through the excavation of an adequate number of test pits should take place in these areas to determine if the proper leachfield areas along the contours exist.

Types of Wastewater Suitable for Discharge in this Area.

It is anticipated that this area of Newtown will be classified and mapped as a GAA or GA area in Connecticut's Water Quality Standards and Classifications. As such, the only wastewater suitable for discharge to the ground is domestic sewage or wastes which readily biodegrade in the soil - ground water system. Typical industrial wastewaters could not be discharged due to the actual and potential detrimental impact such discharges would have upon ground water quality on the sites themselves and adjacent properties. All potential industrial applicants should be notified that this restriction exists. Discharges of domestic sewage at less than 2,000 gallons per day are reviewed and approved by the Local Health Department. Flows between 2,000 - 5,000 gallons per day are also reviewed by the State Department of Health Services. For flows of greater than 5,000 gallons per day, a State Discharge Permit must also be obtained from the Department of Environmental Protection. All discharge of any process or industrial wastewaters, regardless of quantity, must obtain a State Discharge Permit from the Department of Environmental Protection.

Threat of Industrial Park Development on Local Water Resources

The Town of Newtown should be concerned with those aspects of industrial development which pose a hazard to surface and ground water quality and are not regulated by State or Federal programs. As discussed earlier, the discharge of domestic sewage or industrial wastewaters are regulated by Local or State officials.

The generation, storage, transportation, treatment and disposal of certain types and quantities of Hazardous Wastes are regulated by the Department of Environmental Protection and the Federal Environmental Protection Agency.

However, there are aspects of industrial activity which pose a threat to ground water quality which are not actively regulated from the standpoint of water pollution control. Examples of this would include: the storage and/or use of a variety of chemical products or fuel oils; small generators of hazardous wastes may not fall under the requirements of State or Federal Hazardous Waste regulations; the bulk or drum storage of solvents and their use; the location of floor drains in product use areas, etc.

These types of concerns should be considered and acted upon by local officials in their review of prospective industrial developments. Consideration should focus on whether or not industries which use such materials will be permitted in certain areas of the Town, and if so, what safeguards and restrictions will be imposed.

The Department of Environmental Protection Hazardous Materials Management Unit or Water Compliance Unit may be called upon for assistance in the

review of a specific industrial development. The Department also has the authority to issue State Pollution Abatement Orders for existing or potential sources of pollution.

In closing, it should be recognized that certain aspects of industrial development are controlled from the viewpoint of water pollution control and certain aspects are not. The Town should consider this and plan its course of action so that the category and location of industrial types proceeds in a planned and controlled manner which is compatible with local water resource use.

IX. PLANNING CONSIDERATIONS

A. Consistency of Project with State, Regional, and Local Plans

STATE PLAN

Economic development policies and goals stated in The State Conservation and Development Policies Plan 1979-1982 are essentially too nebulous to relate to this analysis, e.g. "the state must retain and develop new industries which can successfully operate here in order to provide jobs." However, the locational guide map which accompanies that report designates the subject parcel as a "conservation" and "rural" area.

Several standards have been established to define "conservation" and "rural" areas. Those applicable to the subject site are outlined below:

Conservation Area

- Prime agricultural lands - active agricultural lands or prime soils of 25 or more acres;
- Inland-wetland areas.

Rural Area

- Generally remote from existing urban areas, lacking pubic water and sewer as well as industrial, commercial, or residential concentrations;
- Scenic value of general concern;
- No outstanding character of major concern of either a development or conservation nature.

The state plan continues, "Prime agricultural lands should be maintained for food production to the maximum extent feasible by....permitting irreversible conversion to other uses only when a specific proposal conforms to long-range plans, compelling public concerns are demonstrated and alternative sites are not technically feasible or economically justified" (emphasis added). The industrial subdivision proposal would remove "prime agricultural lands" but concurrently, if the preliminary planning designs are implemented (through site plan review of each individual lot), industrial development can exist in harmony with the contiguous land uses. With careful design, the project can also be compatible with other identified conservation values (e.g. inland wetlands).

REGIONAL PLAN

The HVCEO's Regional Development Plan, "A Growth Management Option for the Housatonic Valley Region", is currently under in-house review. Accordingly, until the Council of Elected Officials approves the plan, policies cannot be promulgated.

LOCAL PLAN

Newtown's Plan of Development is currently in the process of being updated. Consequently, the 1969 Plan of Development serves as the focus of local policy. The land use plan identifies the site for industrial use and, consequently, the land is zoned industrial (M-1). A major land development policy in the plan states *"it will be desirable to maintain a healthy relationship between manufacturing jobs in Newtown and the town's population, both to provide employment opportunities within the town, and to maintain a stable economic base".*

The Plan continues, *"The present trends in industry are towards a less intensive use of the land, with more land areas devoted to attractive landscaping and open space. This type of open development is required in three of the industrial zones by the present Newtown zoning regulations....*

Most of the land now zoned or proposed for industry has, or will have, good access to the expressways, a goodly amount has rail access, no great problems of sanitary waste disposal are apparent, and the locations have a minimal or negligible impact on residential streets and homes. Also, the contours of the land present minimal grading and construction problems in the erection of industrial type buildings.

Based on the existing criteria, there is more than adequate industrial land now zoned in suitable locations to meet the needs of the population in 1990, and at theoretical development."

Addressing the industrial protential of Newtown, the Plan concludes: *"There is one condition that will have to be rectified if this potential is recognized--the land zoned for industry must be used for industry. Present zoning permits, in all industrial zones, any use permitted in other zones. Thus residential uses, stores, and roadside businesses can be interspersed with industry to the extent that it is not possible to create a first class industrial complex. The zoning regulations revisions in the 1966 Plan propose to limit new uses in industrial zones to the industrial types, not permitting incompatible uses. Modern industry needs and wants as much protection for its type of use as a first class residential subdivision or a modern shopping center. The types of industrial plants Newtown should encourage to locate here deserve and will require protection against depreciation of their property values from encroachment by incompatible uses".*

Based upon the foregoing, it would appear that State and local plans are generally in accord with the proposed use of this land.

B. Traffic Analysis

The type and density of land use is the most critical input in the design of traffic systems. A primary measure of this interrelationship is entitled "trip

generation". Rates of trip generation vary for equal areas of different land uses.

The proposed project centers on consideration of an industrial subdivision. As such, potential clients (firms) can only be speculated, though the owner of land has stated that corporate headquarters, regional warehouses, and/or "light industry" will be sought.

The table below provides some typical trip generation rates (trip generation rates include travel to and from the site) that were developed by ConnDOT from data gathered in Connecticut.

TRIPS GENERATED BY VARIOUS LAND USES

Industrial Parks

Trips per 1000 sq. ft. of gross floor area	7.6
Trips per acre of gross land area	52.1
Trips per employee	4.2
A.M. peak hour as percent of total day	13.0%
P.M. peak hour as percent of total day	13.7%

Corporate Headquarters

Trips per 1000 sq. ft. of gross floor area	6.9
Trips per acre of gross land area	23.6
Trips per employee	3.3
Trips per parking space	3.1
A.M. peak hour as percent of total day	19.7%
P.M. peak hour as percent of total day	18.3%

Regional Offices

Trips per 1000 sq. ft. gross floor area	22.6
Trips per employee	3.0
Trips per parking space	4.0
A.M. peak hour as percent of total day	16.8%
P.M. peak hour as percent of total day	22.7%

Office Building - General

Trips per 1000 sq. ft. gross floor area	20.6
Trips per employee	4.6
Trips per parking space	4.8
A.M. peak hour as percent of total day	14.1%
P.M. peak hour as percent of total day	11.5%

For discussion purposes only, the following example is provided. Assuming the industrial subdivision represents an industrial park, one might expect approximately 4950 trips generated as a result of this proposal. (95 total acres x 52.1 trips/acre of gross land area). The 4,950 trips is synonymous with the additional average daily traffic (ADT) to be expected on the local road network.

Barnabas Street is designated as a residential street (Circulation Plan from 1969 Plan of Development) and is relatively narrow from the proposed access road, serving the eastern end of the property, west to Route 25. Road improvements would be necessary to handle the increased traffic while meeting safety standards (assuming the predominant traffic flow is from Route 25). Accordingly, the functional classification and the design standards of Barnabas Street would have to be upgraded.

C. Permitted Uses in the M-1 Industrial Zone - Impact to Surface (Wetlands) and Ground Waters

In general, permitted uses as promulgated in the zoning regulations appear to present no major problems in terms of possible contamination except for printing and publishing establishments. Consideration should be given to excluding printing and publishing establishments as a permitted use due to the potential qualitative characteristics of the wastewater generated. Wastewater quantities generated are relatively low but the management alternatives for discharge are limited.

Solvents, in the form of chlorinated hydrocarbons, are often used to clean printing presses while oil and grease, dissolved and suspensed solids are other typical wastewater characteristics. Discharge of these wastewaters on site could create significant groundwater contamination as chlorinated hydrocarbons are persistent, not readily biodegradable, and carcinogenic.

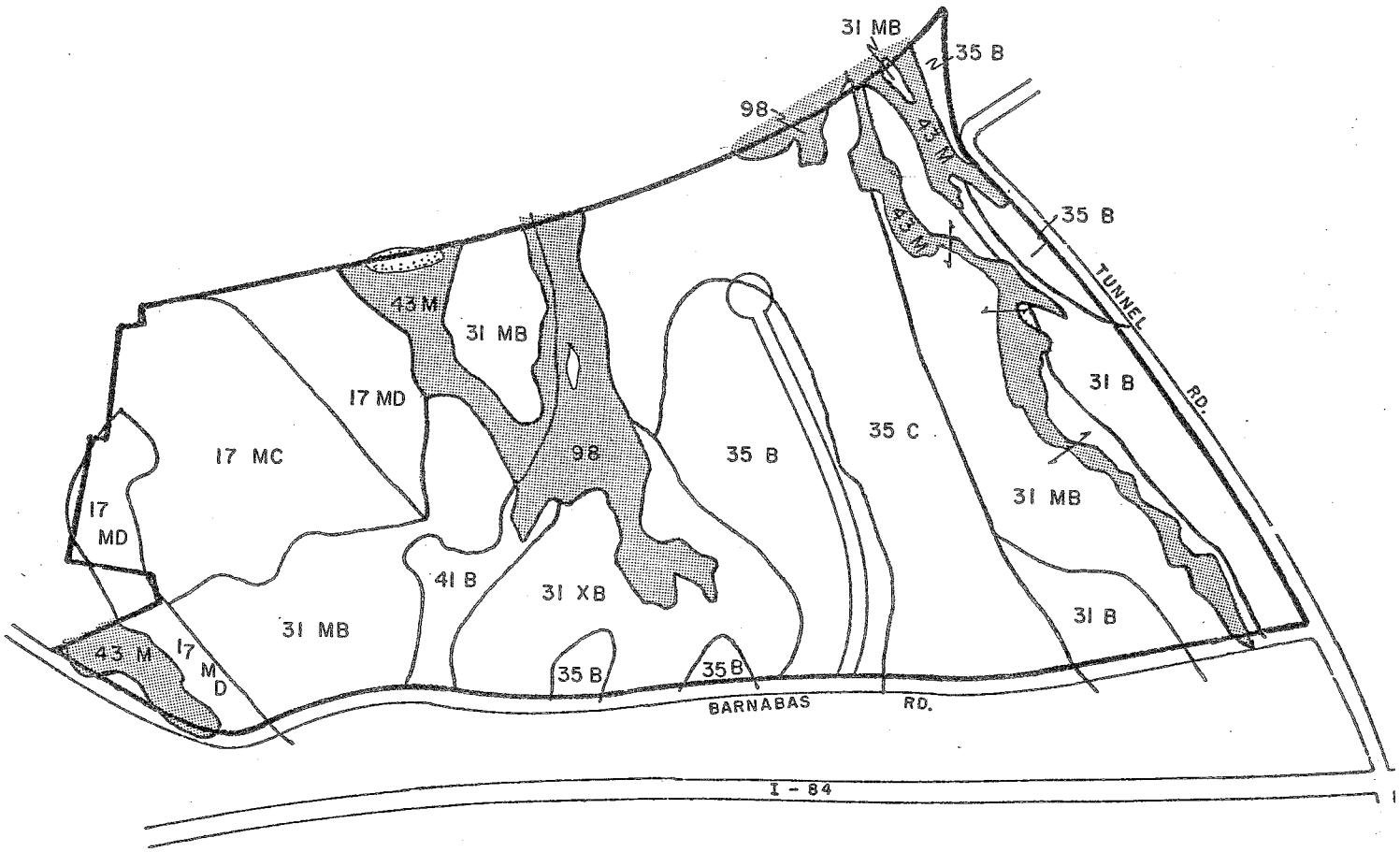
As discussed in the preceeding section of this report, there are aspects of industrial development which pose a hazard to surface and ground water quality and are not regulated by State or Federal programs. The importance of thorough site plan review of each potential firm/lot by the town therefore becomes apparent. Section 4.03c of the Newtown Zoning Regulations provides for such critical site plan review and states:

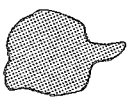
"No use shall be permitted, even if otherwise listed as a principal or accessory use, which causes or results in: Any discharge into the atmosphere, the ground or any brook or other body of water of any substance which, in the form and quantity discharged, will damage the environmental fauna and flora off the lot in question, or which will be harmful to persons breathing the atmosphere or drinking or bathing in the water off the lot."

* * * * *

APPENDIX

SOILS MAP





"FIELD REVISED" WETLAND BOUNDARIES

POND

• INFORMATION ADAPTED FROM DEVELOPER'S SITE PLANS OF 6/80.

SCALE: 1" = 500'

SOILS LIMITATION CHART

MAP SYMBOL	SOIL NAME	ON-SITE SEWAGE DISPOSAL	SMALL COMMERCIAL BUILDING	ROADS AND DRIVEWAYS	LANDSCAPING
17MC	Hollis extremely rocky fine sandy loam, 3 - 15% slopes	Severe; Depth to rock, Slope	Severe; Slope, Depth to rock, Large stones	Severe; Depth to rock	Severe; Depth to rock, Large stones
17MD	Hollis extremely rocky fine sandy loam, 15 - 35% slopes	Severe; Depth to rock, Slope	Severe; Slope, Depth to rock, Large stones	Severe; Depth to rock, Slope	Severe; Slope, Depth to rock, Large stones
31B	Woodbridge fine sandy loam, 3 - 8% slopes	Severe; Percs slowly, Wetness	Severe; Frost action	Severe; Frost action	Slight --
31MB	Woodbridge very stony fine sandy loam, 3 - 15% slopes	Severe; Percs slowly, Wetness, Slope	Severe; Frost action, Slope	Severe; Frost action	Moderate; Large stones
31XB	Woodbridge stony fine sandy loam, 3 - 8% slopes	Severe; Percs slowly, Wetness	Severe; Frost action	Severe; Frost action	Moderate; Large stones
35B	Paxton fine sandy loam, 3 - 8% slopes	Severe; Percs slowly	Moderate; Frost action	Moderate; Frost action	Moderate; Small stones
35C	Paxton fine sandy loam, 8 - 15% slopes	Severe; Percs slowly, Smears, Slope	Severe; Slope	Moderate; Frost action	Moderate; Small stones
41B	Sutton fine sandy loam, 3 - 8% slopes	Severe; Wetness, Smears	Moderate; Slope, Wetness	Moderate; Frost	Slight; --
43M	Leicester, Ridgebury, and Whitman very stony fine sandy loam	Severe; Wetness	Severe; Wetness, Frost action	Severe; Wetness, Frost action	Severe; Wetness
98	Ridgebury fine sandy loam	Severe; High water table	Severe; High water table	Severe; High water table	Severe; High water table

EXPLANATION OF RATING SYSTEM:

SLIGHT LIMITATION: indicates that any property of the soil affecting use of the soil is relatively unimportant and can be overcome at little expense.

MODERATE LIMITATION: indicates that any property of the soil affecting use can be overcome at a somewhat higher expense.

SEVERE LIMITATION: indicates that the use of the soil is seriously limited by hazards or restrictions that require extensive and costly measures to overcome.

ABOUT THE TEAM

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

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

PURPOSE OF THE TEAM

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

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

REQUESTING A REVIEW

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

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