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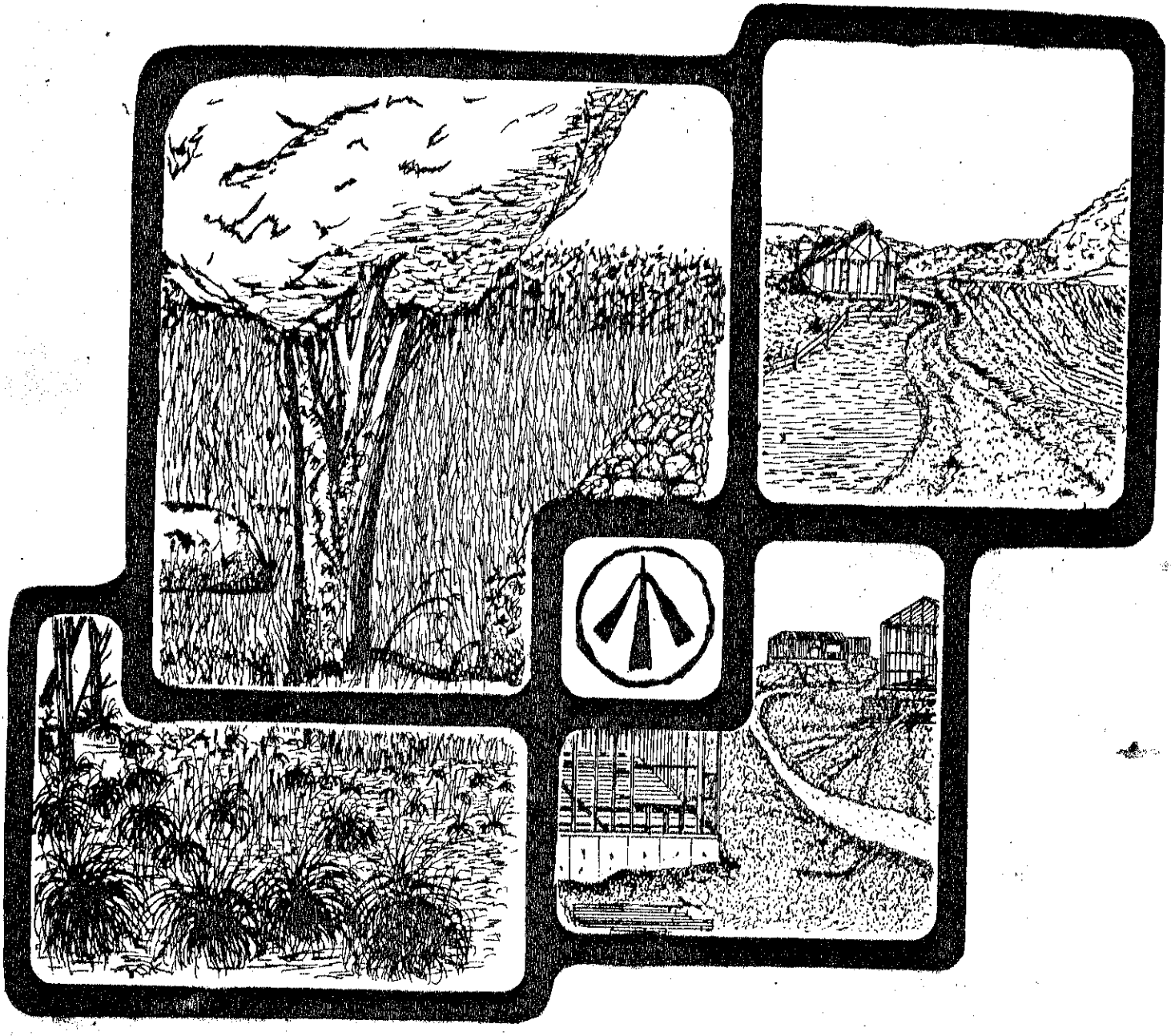
ENVIRONMENTAL REVIEW TEAM REPORT

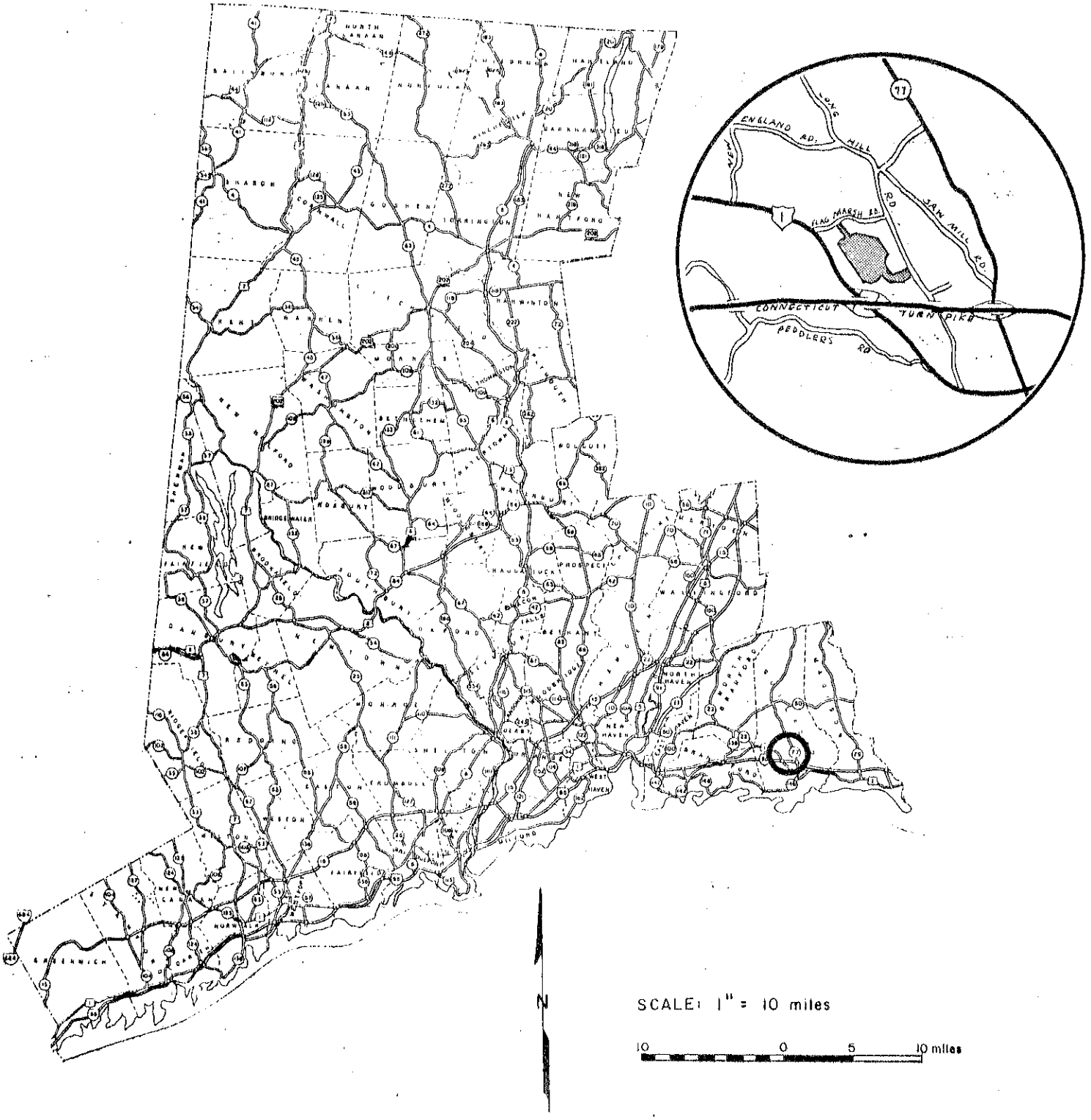


COPPER HILL PLANNED RESIDENTIAL DEVELOPMENT
GUILFORD, CONNECTICUT

KING'S MARK
RESOURCE CONSERVATION AND DEVELOPMENT AREA

LOCATION OF STUDY SITE

COPPER HILL PLANNED RESIDENTIAL DEVELOPMENT
GUILFORD, CONNECTICUT



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ON
COPPER HILL PLANNED RESIDENTIAL DEVELOPMENT
GUILFORD, CONNECTICUT

I. INTRODUCTION

The Town of Guilford, Connecticut is presently reviewing a preliminary proposal for planned residential development of ± 42 acres of land in the southcentral portion of town. The subject site is located off Flag Marsh Road, Crabapple Lane, and Long Hill Road, and is mostly wooded (see Figure 1). The proposed project calls for a total of 84 condominium dwelling units consisting of 20 two bedroom ranch units, 40 two bedroom town house units, and 24 one bedroom town house units. Supporting facilities include two ponds, two deck tennis courts, a bike/jogging trail, and a picnic area (see Figure 1).

Interior access to the project is proposed to be provided by constructing a private road network off Long Hill Road. An alternate, but less preferable, access route is available off Crabapple Lane. Access to the parcel is also possible off Flag Marsh Road; this access point is presently being considered for "emergency" vehicle use only.

Preliminary development plans indicate the project would be served by public water supply and on-site community subsurface sewage disposal systems.

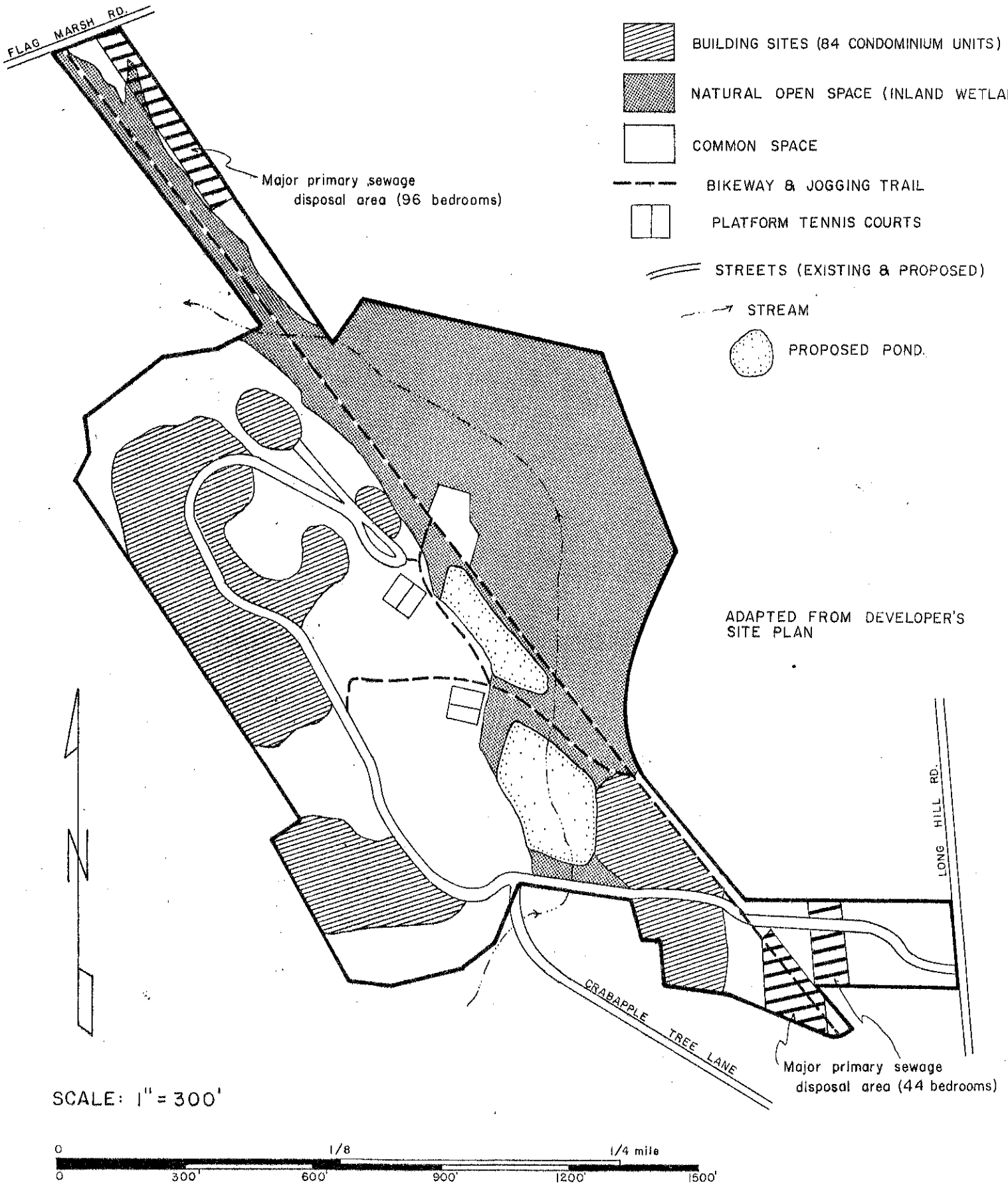
The Planning and Zoning Commission from the Town of Guilford requested the assistance of the King's Mark Environmental Review Team (ERT) to help the Town in analyzing the proposed development. Specifically, the ERT was asked to identify the natural resources of the site and to highlight opportunities and limitations for development of the land. Major concerns raised by the Town in requesting this review included the impact of the project on soil erosion, storm water run-off, and traffic; and the suitability of the site for the proposed sewage disposal system.

The ERT met and field reviewed the site on March 14, 1979. Team members for this review consisted of the following:

Frank Indorf	District Conservationist	U.S.D.A. Soil Conservation Service
Dwight Southwick	Civil Engineer	U.S.D.A. Soil Conservation Service
Michael Zizka	Geohydrologist	State Department of Environmental Protection
Robert Rocks	Forester	State Department of Environmental Protection
Gregory Bonadies	Sanitarian	State Department of Health
Norris Andrews	Regional Planner	Southcentral Connecticut Regional Planning Agency

FIGURE I.

SIMPLIFIED SITE PLAN



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. Preliminary plans and documents prepared by the developer as part of his application were made available to the team the day of the field review. 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 and recommendations. It is important to understand that the ERT is not in competition with private consultants, and hence does not perform design work or provide detailed solutions to development problems. Nor does the team recommend what ultimate action should be taken on a proposed project. The ERT concept provides for the presentation of natural resources information and preliminary development considerations--all conclusions and final decisions rest with the Town and developer. It is hoped the information contained in this report will assist the Town of Guilford and the landowner/developer in making environmentally sound decisions.

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

II. SUMMARY

- The Copper Hill site consists of three distinctly different soil areas. The western portion of the property consists of shallow to bedrock soils, the central portion consists of wetland soils, and the southeastern corner consists of shallow hardpan soils. According to Soil Conservation Service criteria, all of these soil types present severe limitations for residential development. Although these limitations do not necessarily preclude development of the proposed project, they do indicate that extensive and costly measures will be required to accomplish the project and that great care will be required to avoid significant environmental harm.

- The Copper Hill tract consists of six distinct vegetation types. Designation (as planned) of the wetland on the tract as natural open space will help preserve and protect the quality and productivity of this ecologically important area. Fuelwood thinnings in the mixed hardwood stands and the hardwood swamp would benefit the residual trees by reducing crowding and in time increasing stability.

- Most run-off from the site flows eastward into the wetland area, from which it is channeled northwest via a small, unnamed stream to join Spinning Mill Brook. Development of the property as planned would cause increases in the flow rates of both watercourses. It is estimated that peak flows in the small stream would increase approximately 10 percent for a 25-year frequency, 24-hour duration storm. Peak flows in Spinning Mill Brook would increase approximately 3 percent for the same storm event. These increases may cause some additional erosion along the banks of the streams, but they would not, by themselves, be expected to add significantly to flood elevations in the area. Consideration should be given to utilizing the proposed ponds for stormwater control.

- The suitability of the land proposed for sewage disposal is one of the most critical concerns of the Copper Hill development proposal. With a project bedroom count of 144, it is estimated that 21,600 gallons of wastewater per day would be discharged from the development into the proposed leaching fields. Two major primary areas are proposed for sewage disposal. The compact nature of the glacial till overburden (hardpan) in the southeastern leaching area is of concern in terms of the till's characteristically slow percolation rates and its seasonal wetness. Without appropriate engineering precautions, these natural conditions may result in the breakout of effluent at the surface or insufficient renovation of wastewater. The other major area proposed for waste disposal, a $\pm$ 1.5 acre sand and gravel area in the northeastern portion of the site, causes concern due to the rapid permeability typical of sand and gravel soil, the high water table identified in this soil area, and the large amount of effluent proposed to be discharged. Rapid percolation of such a large volume of septic effluent could negatively impact the quality of groundwater in this area and possibly pollute the small stream transecting the site. Drowning of the system by high groundwater levels is another potential concern. The importance of thorough hydraulic analysis and careful engineering at the Copper Hill site cannot be overemphasized.

- *Shallow to bedrock conditions in the western portion of the site will create difficulties in road construction, and in the installation of water mains, storm drains and sanitary sewer lines. Blasting will be required to get proper grade and alignment.*

- *It is calculated that the project, when fully occupied, would generate an average of between 539 and 570 vehicular trips per weekday. The current proposal for access to the project directly from Long Hill Road is superior to a previously considered plan of access from Crabapple Lane and Russet Drive.*

- *It is estimated that a development with this bedroom mix would have a final population of about 174 persons. School age population generated should be less than ten students.*

- *A principal issue to be resolved is whether the proposed planned residential development, which provides an opportunity for maximum utilization of the site by a close clustering of residential units, is preferable to what could only be a most limited development, if at all, given the character and physical constraints of the site itself. This issue can only be resolved by the Guilford Planning and Zoning Commission in the Commission's interpretation of the Town Plan of Development.*

III. SETTING, TOPOGRAPHY, LAND USE

The Copper Hill planned residential development site is located about 1½ miles northwest of the Town Center. The property is irregularly shaped and surrounded primarily by vacant land or single family units situated on large lots. Access to the parcel is provided by Flag Marsh Road on the north, Long Hill Road on the east, and Russet Drive/Crabapple Lane on the south. Route 1 is located just west of the tract and the Connecticut turnpike is located about ½ mile south of the site (see Figure 2).

The project site is an interesting tract of land. The eastern half of the property is nearly flat and consists primarily of wetland. Abutting this wetland area on its western edge is moderately to steeply sloping land which rises to a plateau on the western edge of the property. This western portion of the property contains numerous rock outcrops. Minimum and maximum elevations on the property are 60 feet and 140 feet respectively (see Figure 3).

The parcel contains several woods roads, and one small stream which winds through the wetland area of the property enroute to Spinning Mill Brook. Perhaps the most notable physical feature of the tract is the abandoned trolley right-of-way which bisects the parcel from north to south (see Figure 3).

IV. GEOLOGY

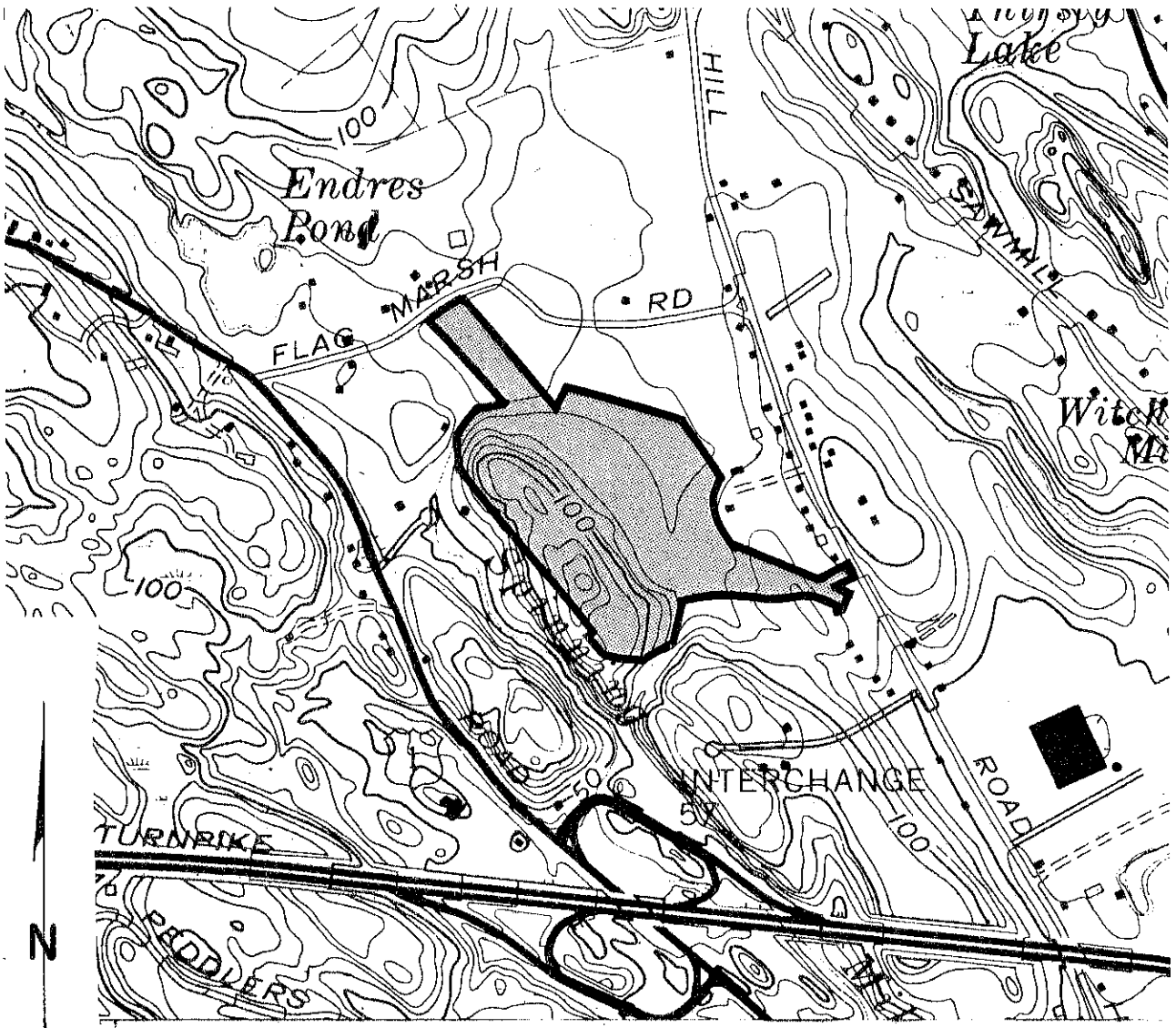
The surficial geology of the Guilford quadrangle, mapped by R. F. Flint, is published in Quadrangle Report No. 28 of the Connecticut Geological and Natural History Survey. The bedrock geology of the quadrangle, not yet published, was mapped by Stanley Bernold and is available for inspection at the Natural Resources Center of the Department of Environmental Protection. The two maps illustrate the general distribution and nature of geologic materials in the vicinity of the site proposed for development.

Most of the surficial materials on the property are of glacial origin. Till, which thinly covers the bedrock on the hillier, western portion of the site, consists of rock particles and fragments of various shapes and sizes. These particles were chipped, plucked, or abraded from preexisting bedrock outcrops or soils, and were redeposited directly from the ice without subsequent working by glacial meltwater. Sand and gravel deposits, which were laid down by meltwater streams, underlie the flatter, eastern section of the property. In many areas, the sand and gravel is covered by fine-grained, organic-rich swamp deposits.

Bedrock on the site consists of schists and gneisses of the Monson and Middletown formations. These are complex rock units of variable composition and texture. Major mineral components include quartz, plagioclase, biotite, and hornblende, while less prominent components include sillimanite, anthophyllite, garnet, and tremolite. Numerous outcrops of these rocks occur in the hillier section of the property.

FIGURE 2.

GENERAL SITE LOCATION MAP



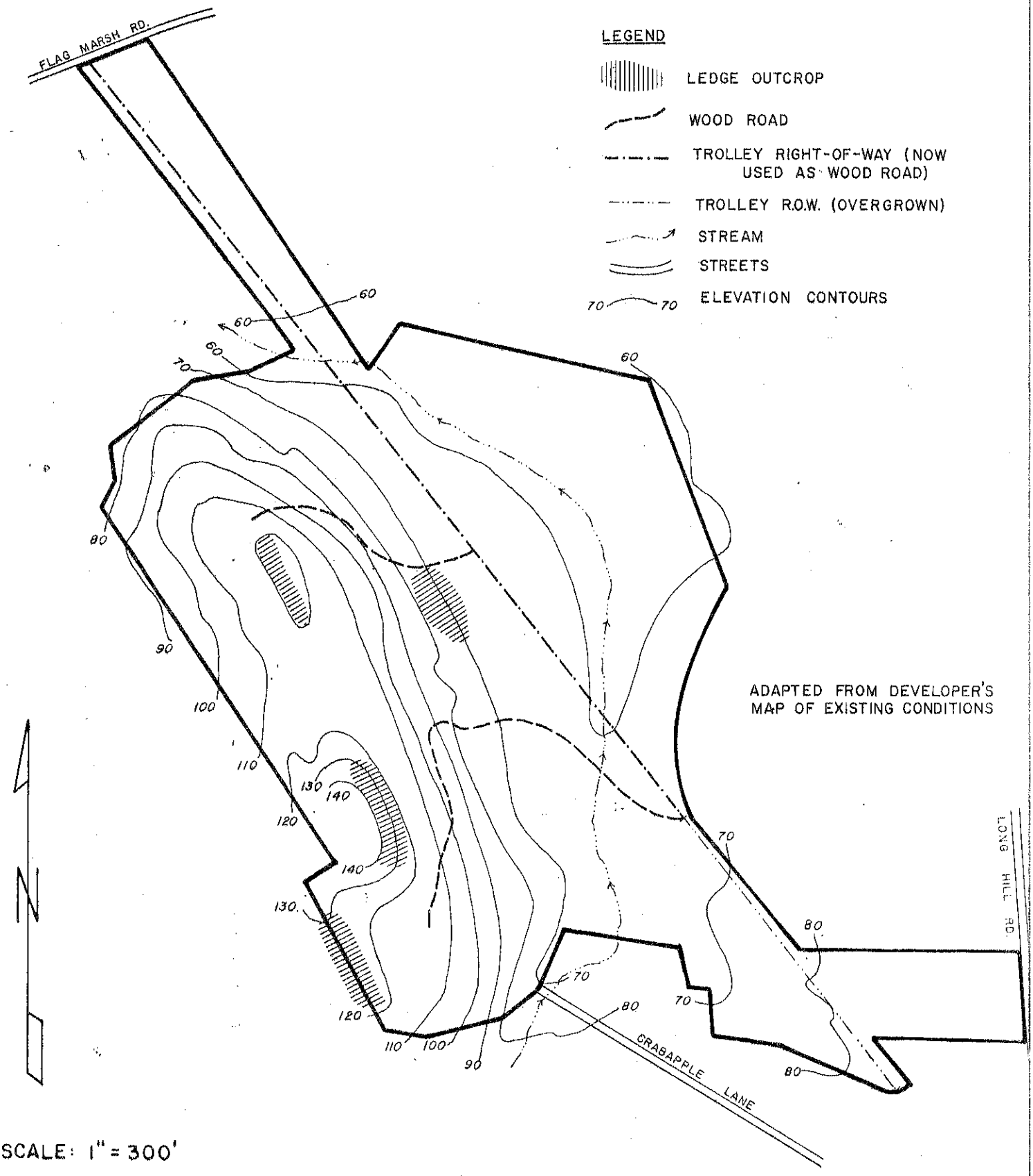
SCALE: 1" = 1000'

0 1/4 1/2 mile

0 1000' 2000' 3000'

FIGURE 3.

EXISTING LAND USE MAP



V. SOILS

The Copper Hill site consists of three distinctly different soil areas. The western third of the site consists of shallow to bedrock Hollis soils (map symbols 17MD and 17MC - see Soils Map in Appendix). Depth to bedrock on these soils ranges from 10 to 20 inches. Construction of houses and roads on these soils is severely limited by both shallowness to bedrock and slope.

The central portion of the site consists primarily of wetland soils (map symbols 466 and 464). These soils present severe limitations for development due to wetness and frost action and are regulated by Public Act 155, Connecticut's Inland Wetland and Water Courses Act.

The southeastern third of the property consists of hardpan soils (map symbols 31B and 35B). These soils present severe limitations for on-site sewage disposal due to slow percolation rates and seasonal wetness. Frost action is a concern in the construction of roads and driveways. Wetness and frost action are both legitimate concerns in the construction of buildings on these soils.

It is clear from the foregoing discussion and the information contained in the Soils Limitation Chart (see Appendix) that most of the soils on the property have severe limitations for residential development. These soil limitations do not necessarily preclude development of the proposed project, but they do indicate that costly measures will be needed to accomplish the project and that great care will be required to avoid significant environmental harm.

Soil Loss and Sedimentation

Due to the severe soil limitations on the Copper Hill site, close attention should be paid to sediment and erosion control. Of particular concern is the construction of housing units, roads, and parking lots in the steep western portion of the property. Potential for serious erosion problems is high in this area and the resultant sedimentation could adversely impact the wetland areas on-site. With implementation of the proposed project, it is recommended that a comprehensive erosion and sediment control plan be prepared and followed. This plan should include, but not be limited to, the following practices:

1. All disturbed areas, including homesites, road cuts and fills, and stockpiled topsoil, should be vegetated as follows:

    a. Permanent vegetation: where final grading is completed in time for seeding dates, April 1st - June 15th and August 15th - September 20th. Also where areas will be exposed for 12 months or more.

    b. Temporary vegetation: where final grading is not done in time for permanent seeding. Seeding dates for temporary vegetation are August 1st - October 15th.

    c. Mulch should be used to enhance propogation.

2. Roadways and driveways should be constructed as close to the land contour as possible with finished cut and fill grades at 2:1 side slopes (3:1 for sandy and gravelly soils).

3. Hay bale erosion checks should be placed around all storm drain inlets. Streams and gullys should also be protected with hay bales. All bales should be checked and replaced during construction as needed.

4. Top soil should be stock-piled and used to establish vegetation in critical areas.

5. All land disturbance in close proximity to wetlands and/or streams should be kept to a minimum where possible and hay bales used to help reduce sediment runoff.

VI. FORESTRY

The Copper Hill tract is characterized by six vegetation types. The location of these types is shown in Figure 4 and their composition is discussed below.

Vegetation Type Descriptions

STAND A. Hardwood Swamp. This 13 acre over stocked stand is made up of sapling to pole size red maple in clumps on hummocks. Pole size red maple, white ash and black cherry are present along the trolley right-of-way. Sweet pepper bush, highbush blueberry, spice bush, alder and honeysuckle form a dense understory in parts of this stand. Ferns, mosses, sedges, and skunk cabbage are the dominant ground cover species present.

STAND B. Oak Ridge. Sapling to pole size poor quality chestnut oak, white oak, scarlet oak, black oak and occassional black birch are present in this 8 acre under stocked stand. The understory is made up of hardwood tree seedlings, hemlock seedlings, mountain laurel, red cedar, highbush blueberry, sassafras and greenbrier. Huckleberry, grasses and club mosses form a dense ground cover.

STAND C. Hemlock. Pole to sawlog size hemlock dominate this 7 acre fully stocked stand. Occasional white oak, black oak and hickory are also present. Christmas fern, roundlobed hepatica and pipsissewa were the only ground vegetation observed.

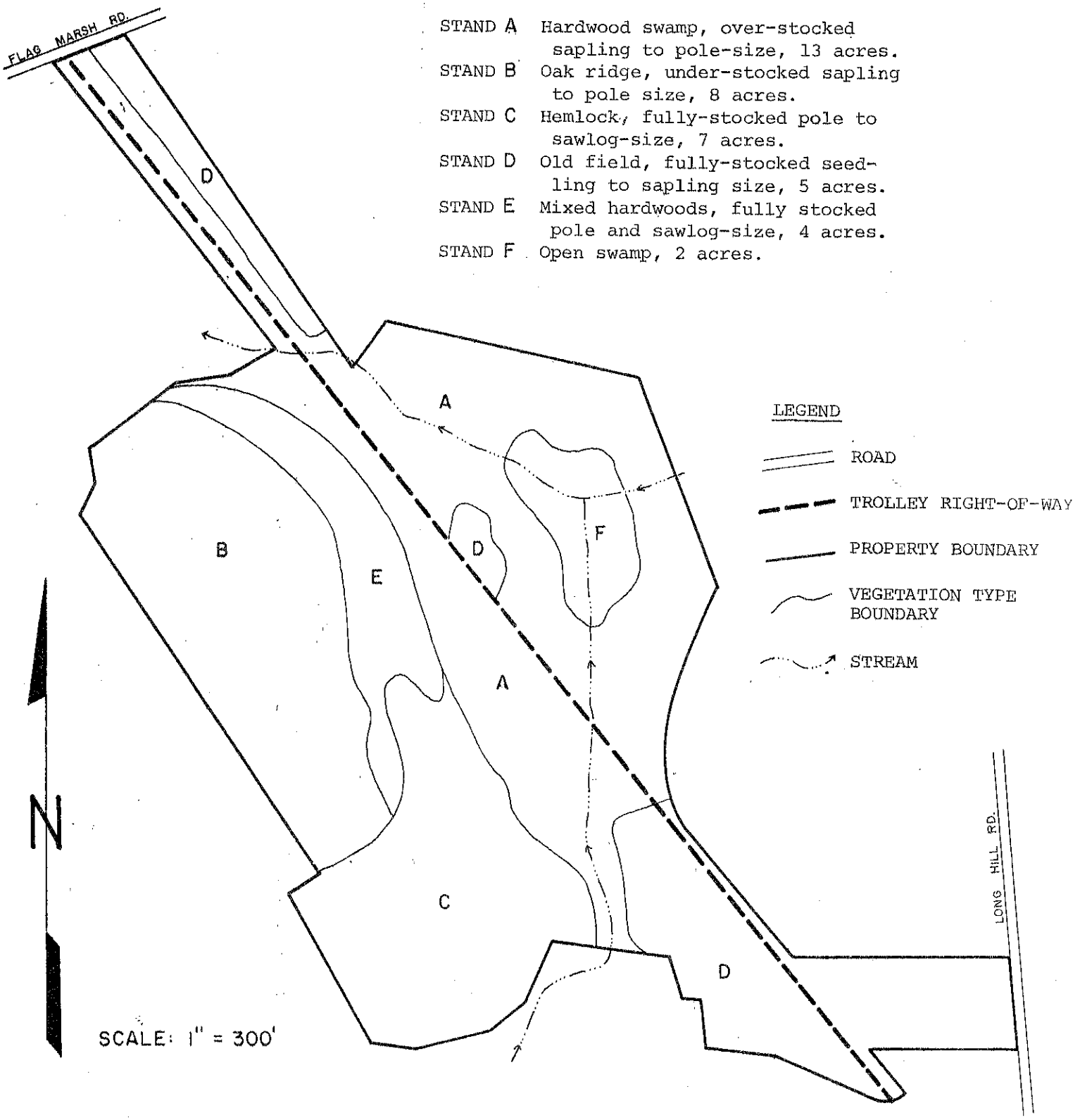
STAND D. Old Field. This 5 acre old field area is fully stocked with seedling to sapling size red cedar, quaking aspen and poor quality apple trees. Multi-flora rose, honeysuckle, greenbrier, red maple seedlings and black cherry seedlings are present along with grasses, goldenrod and dewberry.

STAND E. Mixed Hardwoods. This 4 acre two age stand is fully stocked and becoming crowded. Poor quality sawlog size white oak and scarlet oak are present with sapling to pole size white oak, hickory and black birch. Blue beech, sassafras, witchhazel, red cedar, gray birch and scattered hardwood tree seedlings form this areas understory. Grasses and club mosses are the ground cover species in this stand.

STAND F. Open Swamp. Approximately 2 acres of open swamp are present on this property. Sedges are the dominant form of vegetation with scattered thickets of speckled alder.

FIGURE 4.

VEGETATION TYPE MAP



*SEEDING SIZE - Trees less than 1 inch in diameter at breast height (d.b.h.)
SAPLING SIZE - Trees 1 to 5 inches in d.b.h.
POLE SIZE - Trees 5 to 11 inches in d.b.h.
SAWLOG SIZE - Trees 11 inches and greater d.b.h.

Forestry Related Concerns

AESTHETICS AND PRESERVATION

The 15 acre inland wetland located within this tract (Stand A and Stand F) has great ecological importance and should be preserved as open space. Vegetation plays a key role in the wetland's ability to store flood waters and release them slowly, reducing flooding down stream. The wetlands also serve to protect water quality by trapping sediment and biologically breaking down harmful pollutants which cling to sediments.

The dense shruby vegetation in this area provides excellent food and cover for a large variety of wildlife.

LIMITING CONDITIONS

The soils found in Stand B (oak ridge) are extremely shallow to bedrock, excessively drained and have restricted moisture reserves. Many of the trees present are slow growing, to the point of being stunted and malformed, because of the lack of adequate moisture during the rapid growth season. Chestnut oak which is somewhat tolerant of these low moisture conditions is the dominant tree species present.

The high water table and poor soil aeration in the hardwood swamp (Stand A) and the open swamp (Stand F), limit vegetation growth to species tolerant of excessive moisture conditions. Red maple will usually survive under these conditions, however early over-crowding often results in slow growing, poor quality trees which have little value for timber products. As fuelwood demand increases, these areas may be managed for fuelwood production.

POTENTIAL HAZARDS AND MITIGATING PRACTICES

Excavating, filling and grading for construction of roads, driveways or buildings will cause changes in soil conditions which will have an impact on tree health and vigor. Soil disturbances under a tree's crown may cause a decline in the tree's health and perhaps death within three to five years. Soil disturbances should be minimal near trees that are to be preserved.

Wherever possible, trees should be saved in small groups or "islands". This practice will help to protect trees from soil alteration and mechanical injury. Generally, trees which are healthy are better able to withstand development disturbances than unhealthy trees.

Windthrow may be a hazard in Stand A, B and C. The trees in the hardwood swamp (Stand A) are shallow rooted and crowded. The saturated soils in this stand do not provide a good substrate for trees to become anchored in; as a result the potential for windthrow is high. A thinning in this stand will allow trees to become more stable and wind firm over time.

The trees in Stand B (oak ridge) and Stand C (hemlock) are also shallow rooted. Unless the underlying bedrock is highly fractured, tree roots can not become adequately anchored in the shallow soil and windthrow potential will remain high.

SUGGESTED MANAGEMENT TECHNIQUES

A fuelwood thinning in the hardwood swamp (Stand A) would reduce stocking levels and result in a healthier, more stable residual stand less susceptible to windthrow. Approximately one-third of the volume should be removed, concentrating on unhealthy slow growing, poor quality trees and those trees directly competing with healthier higher quality trees. This thinning would be best carried out during the winter when the wetland is frozen over. Although a commercial thinning is not feasible in Stand E, a thinning could be implemented through a fuelwood sale. Once again this thinning would reduce crowding and in time the residual trees will become healthier and better able to withstand developmental stresses. The poor quality sawlog size trees should be removed along with between one-quarter and one-third of the pole size trees.

With implementation of the suggested fuelwood thinnings, a consultant should be contacted to mark the trees to be removed.

VII. HYDROLOGY

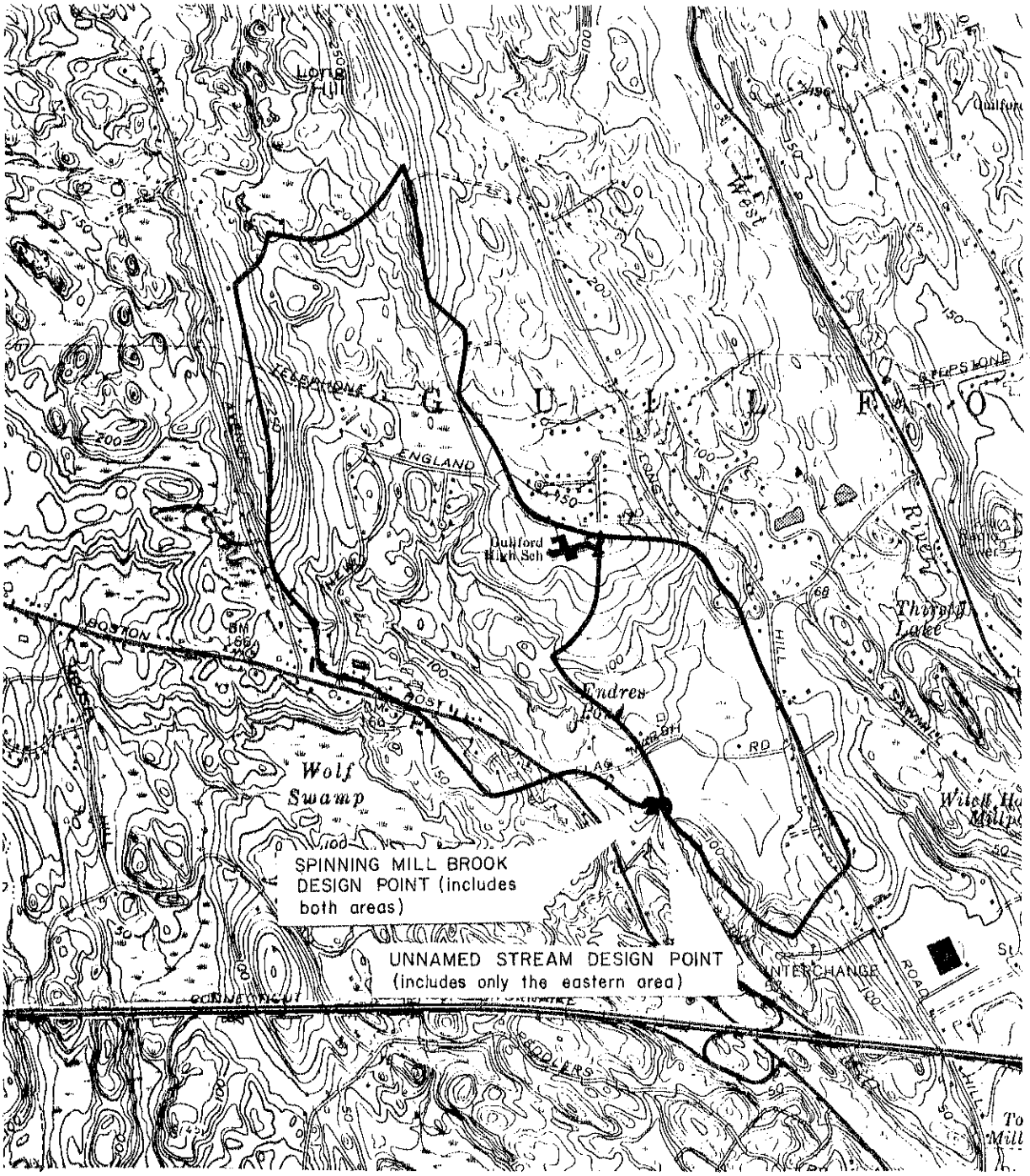
Most runoff from the site flows eastward into a wetland area, from which it is channeled northwest via a small, unnamed stream to join Spinning Mill Brook. For convenience, the unnamed stream is simply designated as "the stream" throughout this section; Spinning Mill Brook is designated as "the brook". Development of the property as planned would cause increases in the flow rates of both watercourses. These increases would be greater in percentage for times of lower flows than for times of higher flows.

Based on a procedure outlined in Technical Release No. 55 of the Soil Conservation Service, it is possible to estimate the magnitude of the peak flow increases to be expected in the two watercourses following development. The procedure involves an analysis of the drainage areas of the watercourses, including such factors as size, slopes, land uses, and soil types. The two drainage areas of concern for this study are shown in Figure 5, along with their respective design points (points of discharge). It was assumed that all water from the developed area would be carried either naturally or artifically into the wetland area of the site (although under completely natural drainage conditions, some runoff would flow westward, directly into the brook).

It is estimated that peak flows in the stream would increase approximately 10 percent for a 25-year frequency, 24-hour duration storm, and approximately 8 percent for a 50-year, 24-hour storm. Peak flows in the brook would increase approximately 3 percent for either storm. These increases may cause some additional erosion along the banks of the streams, but they would not, by themselves, be expected to add significantly to flood elevations in the area. As a matter of policy, however, it would be desirable to regulate flows in the stream to prevent any peak flow increases in the brook, since a number of future developments that could occur in the brook's drainage area ultimately could produce significant additional flooding. Flow regulation in the stream could be accomplished by outlet control from the proposed ponds, if these are also used as runoff detention basins.

FIGURE 5.

DRAINAGE AREAS FOR TWO DESIGN POINTS ON SPINNING MILL BROOK & ON THE UNNAMED STREAM ON THE COPPER HILL SITE.



VIII. SEWAGE DISPOSAL

According to soils mapping by the Soil Conservation Service, the western portion of the Copper Hill site consists of shallow to bedrock soils, the central portion consists of wetland soils, and the eastern portion consists of shallow hardpan soils. According to Soil Conservation Service criteria, all of these soils present severe limitations for septic absorption fields.

Two major primary areas for sewage disposal have been proposed. One area, in the southeastern corner of the property (see Figure 1), is proposed to service 44 bedrooms with 10,600 linear feet of leaching trench. The other area, in the northern portion of the property, is proposed to service 96 bedrooms with 1800 linear feet of 4 x 4 gallery. With a project bedroom count of 144, it is estimated that 21,600 gallons of wastewater per day would be discharged from the development into the proposed leaching fields. This substantial volume of effluent must receive adequate treatment in the soil zone prior to its discharge into the small streams and wetland on the site.

The compact nature of the glacial till overburden (hardpan) in the southeastern leaching area is of concern in terms of the till's characteristically slow percolation rates and its seasonal wetness. Without appropriate engineering precautions, these natural conditions may result in breakout of effluent at the surface or insufficient renovation of wastewater. In a recent State Department of Health publication entitled "Guidelines For Design of Sewage Disposal Systems" the following statements are made:

> "Sewage system failures are common in hardpan soil area. In most cases, these are related to failure to properly evaluate the effect of the underlying hardpan, perched water table and poor design of the leaching system. Often the percolation test hole only penetrates a few inches into the hardpan layer. When tested with a 12-inch depth of water, a fairly good percolation rate may be obtained due to lateral seepage into the layers of good soil on top of the hardpan. However, the leaching system subsequently may be constructed deeper into the underlying hardpan and fail due to poor seepage or ground water flowing on top of the hardpan layer.
>
> With proper testing, design and construction, sewage disposal is feasible in hardpan with a minimum percolation of one inch in 60 minutes or faster if the ground water can be controlled. It is also possible to construct leaching systems which will function properly in soils overlying less pervious hardpan layers, providing there is at least a 30-inch depth of suitable soil on top of the hardpan. Percolation tests should be made entirely within the underlying hardpan in order to determine its true minimum percolation rate. The size of the leaching system should be based on this rate, even though it may be located partially or entirely in the more suitable soil overlying the hardpan.
>
> There is almost always perched ground water flowing on top of the hardpan during the wet season or after periods of heavy rainfall. This ground water will collect in leaching systems which penetrate into the hardpan layer, particularly on hillsides where the ground water will flow down from higher elevations. Uphill curtain drains should be used whenever possible to alleviate this condition."

The foregoing illustrates the need for very cautious planning and design of the septic system in this area.

The other major area proposed for waste disposal, located in the northern portion of the property, is mapped as an inland wetland soil according to the Soil Conservation Service mapping (see Soils Map in Appendix). More detailed inland wetland mapping by the applicant indicates that a ± 1.5 acre portion of this northern area, corresponding to the eastern half of the tongue at the northern end of the property, is not wetlands. It is within the ± 1.5 acre area that most of the sewage generated by the project is to be disposed (see Figure 1).

Deep test pits in this northern area were not yet conducted by the applicant the day of the ERT field review. Hence the team could not inspect soil profiles in this area. The applicant's soil analysis of test pits conducted on April 26, 1979 shows the subject area underlain by sands and gravels with water present at 40" to 60". Percolation tests conducted in the area were fast (i.e. less than 5 minutes per inch).

Sewage disposal in this northern area is an area of special concern due to the rapid permeability typical of sand and gravel soils, the high water table identified in this soil area (40 to 60 inches), and the large volume of effluent proposed to be discharged in this area (an estimated 14,400 gallons per day for 96 bedrooms). Rapid percolation of such a large volume of septic effluent could negatively impact the quality of groundwater in this area and possibly pollute the small stream transecting the site. Drowning of the system by high groundwater levels is another potential concern.

Prior to construction of the proposed sewage disposal system, approval by the State Health Department will be required as will a permit from the State Department of Environmental Protection. Both agencies will require the developer to show that the sewage disposal system will work and that the system will not cause pollution. In addition, if the proposed leaching galleries infringe upon inland wetland boundaries as shown in preliminary development plans, a permit will be required by Guilford's Inland Wetland Commission.

The sutiability of the land proposed for sewage disposal is one of the most critical concerns of the Copper Hill development proposal. Preliminary analysis indicates that the proposed leaching areas may not be large enough to service the proposed number of bedrooms. The importance of thorough hydraulic analysis and careful engineering cannot be overemphasized.

IX. INTERIOR ROAD AND STORMWATER CONTROL

As shown in the soils limitation chart of this report, most of the soils on this property present severe limitations for road construction. Principal limiting factors include shallow to bedrock conditions, wetness, and frost action.

About 1800 feet of the proposed interior road is underlain by shallow to bedrock soils. Assuming a road width of 25 feet and an average of 3 feet of fill with 2 to 1 side slopes, this portion of the road alone would require about 6,200 cubic yards of earth fill. Road fill is proposed to be obtained by excavating the two proposed ponds on the property. According to the Soil Conservation Service soil maps, these pond areas are underlain by a Raynham silt loam soil. The description of this soil indicates that to a depth of about 4 to 5 feet the soil is a very fine sandy loam and would not be advisable to use as road fill or foundation subbase. The soil is susceptible to liquefaction and side slopes in this soil tend to be very unstable when saturated. This soil is also acidic and vegetation is established

with difficulty. The Raynham silt loam soils overlying any gravel deposits in the pond sites amounts to about 11,000 cubic yards. It would be desirable to dig deep test pits 5 to 10 feet to determine the amount and quality of underlying gravel that could be removed for earth fill purposes.

Shallow to bedrock conditions will also create difficulties in bringing in water mains, the storm drainage systems, and the sanitary sewer lines. Blasting will be required to get proper grade and alignment. Grading around living units, parking lots, and garages will be very difficult due to the presence of bedrock and steep slopes.

Consideration should be given to utilizing the two proposed ponds for sediment and runoff control purposes. Careful consideration should also be given to controlling runoff on the back side of the hill which drains towards White Birch Estates. Since the slope is very steep on this side, erosion could develop on the wooded slope and cause problems for the residents below. As suggested in the soils portion of the report, it is highly advisable to prepare and closely follow a conscientious erosion and sediment control plan with implementation of the proposed project.

X. PLANNING CONSIDERATIONS

Consistency of Proposed Project with State Plans

The "Locational Guide Map" of the State of Connecticut's advisory Conservation and Development Policies Plan identifies the Copper Hill site as a "Rural" area. The proposed State Action Strategy for "Rural" areas is "Avoiding support of structural development forms and intensities which exceed on-site carrying capacity for water supply and sewage disposal on a permanent basis, which are inconsistent with open rural character or conservation values of adjacent areas, and which are more appropriately located in Rural Community Centers".

The development as proposed would appear to be consistent with the State Action Strategy for Rural areas providing the site can support the proposed sewage disposal facilities on a permanent basis.

Traffic Impact

Two sources of traffic generation rates[1] indicate that about 5.3 to 5.6 average weekday trips could be expected for each town house unit and 10 to 10.6 trips per single family detached unit. (A trip is a one-way traffic movement either into or out of a development.) Given the number of units as 64 and 20 respectively, it is calculated that the project when fully occupied would generate an average of between 539 and 570 vehicular trips per weekday.

The above referenced Department of Transportation study indicates that the peak morning and afternoon traffic flows from the town houses would likely occur between 8 - 9 a.m. and 5 - 6 p.m. respectively. For the detached units there is a 70% chance the morning peak will occur between 7 - 8 a.m. and a 70% chance that the evening peak will be between 5 - 6 p.m. It appears that the evening peak will have the greater traffic volumes, due to the coincidence (5 - 6 p.m.) of town house and detached peak hourly traffic flows. It is estimated that the traffic flow will amount to 53 - 55 vehicle trips during the evening peak hour.

[1] Trip Generation - An Informational Report, Institute of Transportation Engineers. Trip Generation Study of Various Land Uses, Supplement A, Traffic Statistics Unit, Connecticut Department of Transportation.

The current proposal for access to the project directly from Long Hill Road is superior to a previously considered plan of access from Crabapple Lane and Russet Drive. It should also be noted that the developers plan to maintain the existing trolley line as an emergency vehicular access point is commendable and highly important for safety reasons.

Impact on Schools

It is very difficult to gauge the impact of the proposed development on the Guilford School System. The project as proposed calls for a total of 144 bedrooms in 64 town houses (24 contain 1 bedroom, 40 contain 2 bedrooms) and 20 detached 2 bedroom single family homes). Using criteria developed in The Fiscal Impact Handbook, Center for Urban Policy Research, it is estimated that a development with this bedroom mix would have a final population of about 174 persons. School age population generated should be less than ten students. It must be noted that these estimates are general and that the actual population may vary considerably. However, given that the unit mix is only for one and two bedroom units, the project will have a significantly lesser impact on the school system than if it included three and four bedroom units.

Given the fact that this development will generate less than 10 school age children, it appears that this project by itself, will not have a significant impact on the Guilford School System's elementary and middle schools. However, according to school enrollment figures provided to the ERT by the Town Planner, it appears that the Senior High School is presently over capacity by approximately 130 students. Therefore, this project may add a small number of students to this school, aggravating the overcapacity situation.

Proposed Bikeway

The Town of Guilford and the Southcentral Connecticut Regional Planning Agency are most interested in the development of the proposed "multi-use recreational trail" through the tract along the abandoned Shore Line Trolley right-of-way. The right-of-way through the Copper Hill site represents one link of a potential 25 mile public recreational trail running from New Haven to Madison. A "Proposal For A Feasibility Study" of the entire trail project has been prepared by the Connecticut Coalition of Bicyclists (1978) who are working with the State Department of Transportation and State Department of Environmental Protection in studying the feasibility of the trail project.

The proposed residential development plan indicates the trolley right-of-way through the Copper Hill site will be maintained as a recreational trail and "will be a space where public use will be allowed and encouraged". The developer of the Copper Hill Planned Residential Development has indicated to the ERT that he is aware of the multi-use recreational trail proposal and supportive of the concept.

Additional Comments

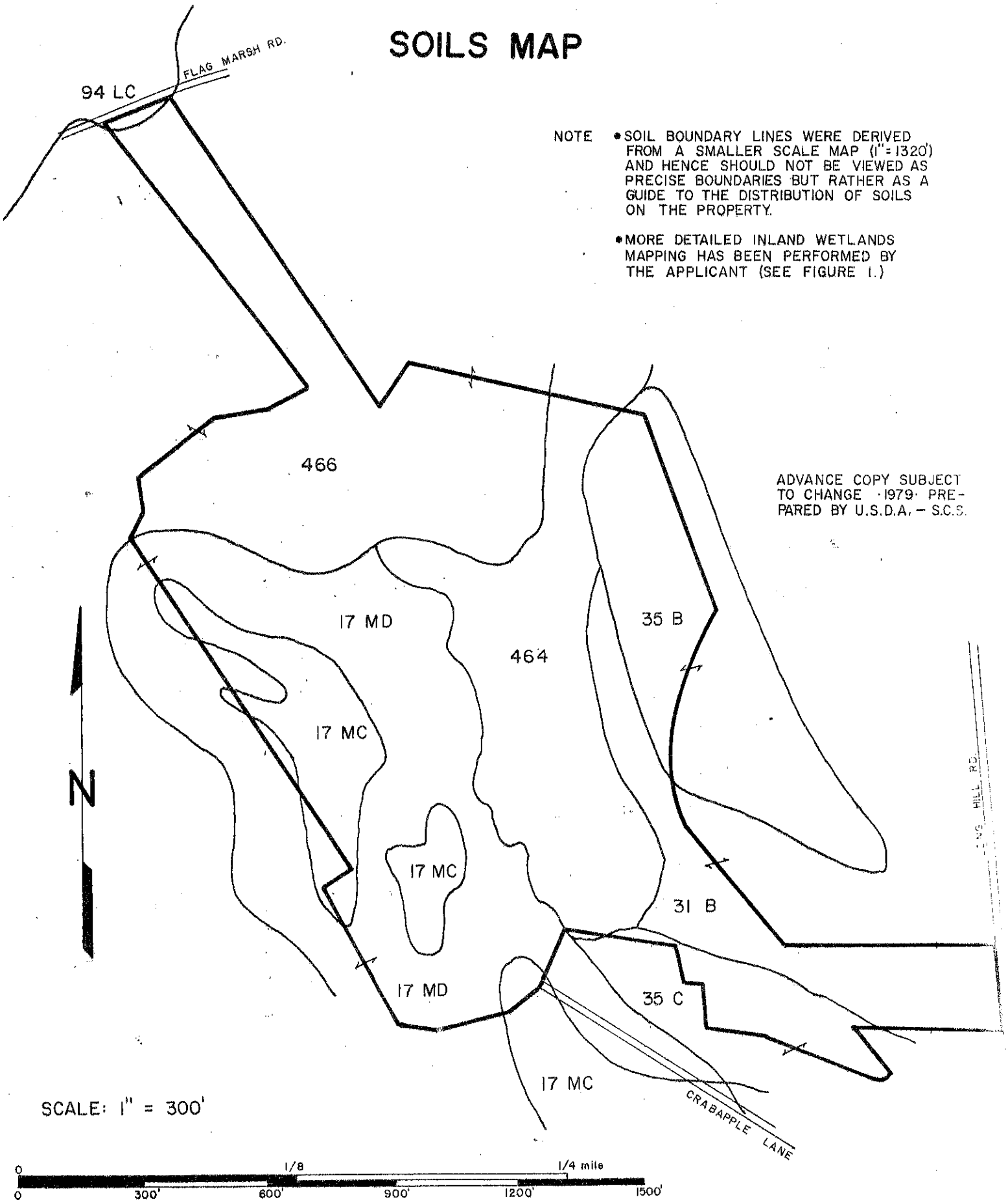
The number of units created by the proposed project, while double that which would be allowed under the present regulations for a conventional sub-division, does not increase overall the bedroom count that would be normal under the present density standard. A principal issue to be resolved is whether planned unit development, which provides an opportunity for maximum utilization of the site by a close clustering of the residential units, is preferable to what could only be a most limited development, if at all, given the character and the physical constraints

of the site itself. This question can only be resolved by the Planning and Zoning Commission in the Commission's interpretation of the Plan of Development and in particular, area A which is identified as that area more suitable for intensive growth than area B.

* * * * *

APPENDIX

SOILS MAP



NOTE
- SOIL BOUNDARY LINES WERE DERIVED FROM A SMALLER SCALE MAP (1" = 1320') AND HENCE SHOULD NOT BE VIEWED AS PRECISE BOUNDARIES BUT RATHER AS A GUIDE TO THE DISTRIBUTION OF SOILS ON THE PROPERTY.
- MORE DETAILED INLAND WETLANDS MAPPING HAS BEEN PERFORMED BY THE APPLICANT (SEE FIGURE 1.)

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

SCALE: 1" = 300'

0 1/8 1/4 mile
0 300' 600' 900' 1200' 1500'

SOILS LIMITATION CHART
COPPER HILL PLANNED RESIDENTIAL DEVELOPMENT

MAP SYMBOL	SOIL NAME	SEPTIC ABSORBTION FIELDS RATING	SEPTIC ABSORBTION FIELDS REASON	BUILDINGS W/ BASEMENTS RATING	BUILDINGS W/ BASEMENTS REASON	ROADS OR DRIVEWAYS RATING	ROADS OR DRIVEWAYS REASON	LANDSCAPING RATING	LANDSCAPING REASON
466	Walpole sandy loam	Severe	Wetness	Severe	Wetness	Severe	Wetness, Frost action	Severe	Wetness
464	Raynham silt loam	Severe	Percs slowly, Wetness	Severe	Wetness	Severe	Frost action, Wetness	Moderate	Wetness
17MC	Hollis extremely rocky fine sandy loam 3-15% slopes	Severe	Depth to rock	Severe	Depth to rock	Severe	Depth to rock	Severe	Depth to rock
17MD	Hollis extremely rocky fine sandy loam 15-35% slopes	Severe	Depth to rock, Slope	Severe	Depth to rock, Slope	Severe	Depth to rock, Slope	Severe	Depth to rock, Slope
35B	Paxton stony fine sandy loam, 3-8% slopes	Severe	Percs slowly	Moderate	Wetness, large stones	Moderate	Frost action	Moderate	Large stones
35C	Paxton stony fine sandy loam, 8-15% slopes	Severe	Percs slowly	Moderate	Wet, large stones	Moderate	Frost action	Moderate	Large stones
31B	Woodbridge fine sandy loam, 3-8% slopes	Severe	Percs slowly	Severe	Frost action	Severe	Frost action	Slight	

EXPLANATION OF RATING SYSTEM:

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

NOTE: Limitation ratings based on U.S.D.A. Soil Conservation Service criteria.

ACKNOWLEDGMENTS

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

Federal Agencies

U.S.D.A. SOIL CONSERVATION SERVICE

State Agencies

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

Local Groups and Agencies

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

x x x x x x

Funding Provided By

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

Policy Determined By

KING'S MARK RESOURCE CONSERVATION AND DEVELOPMENT AREA

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

Staff Administration Provided By

NORTHWESTERN CONNECTICUT REGIONAL PLANNING AGENCY

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

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.