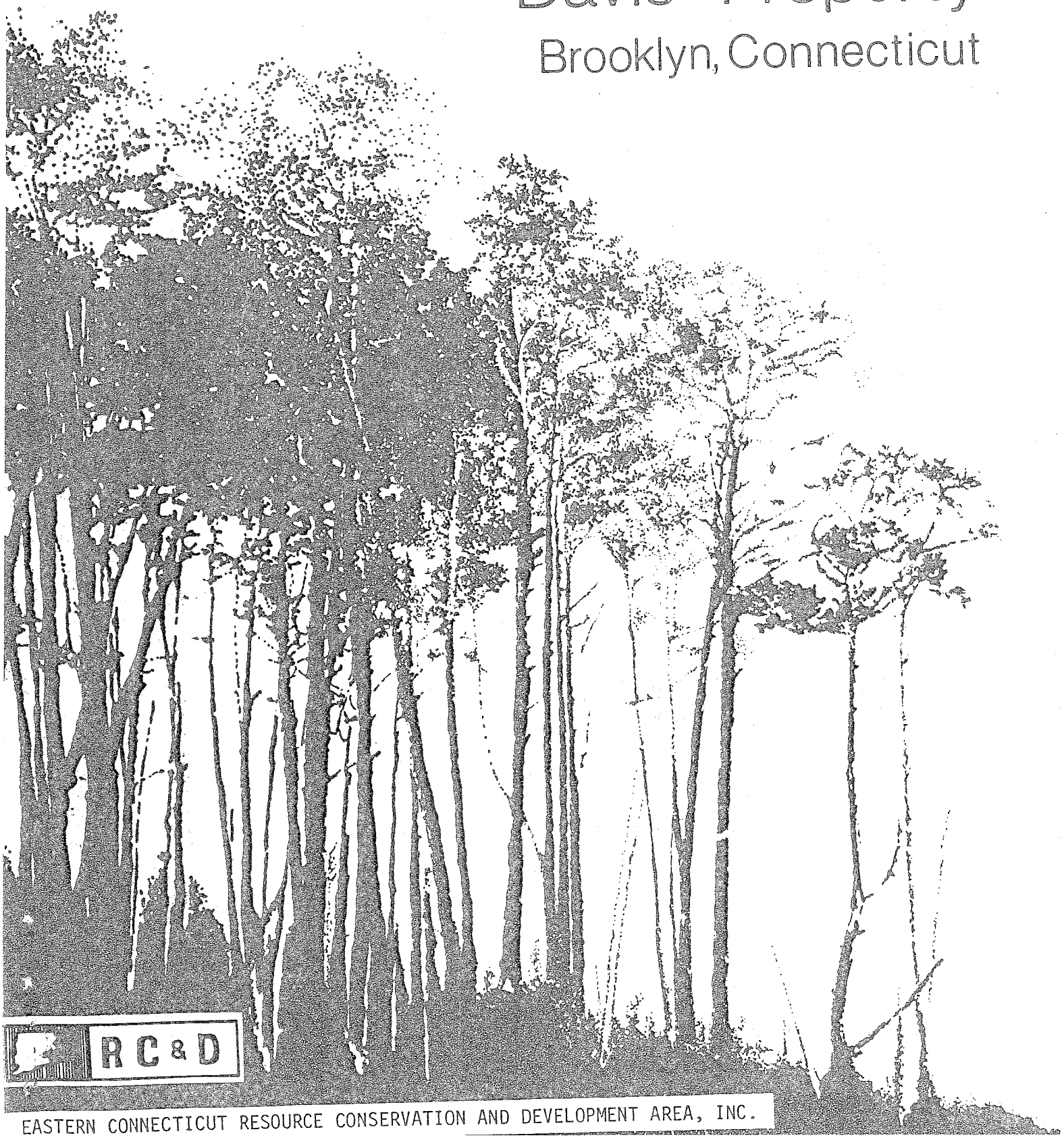
Environmental Review Team Report

Davis Property

Brooklyn, Connecticut



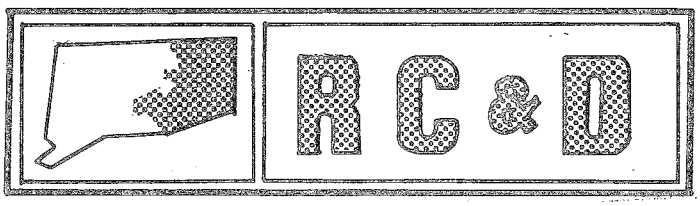
RC&D

EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

Environmental Review Team Report
on

Davis Property
Brooklyn, Connecticut

July 1981

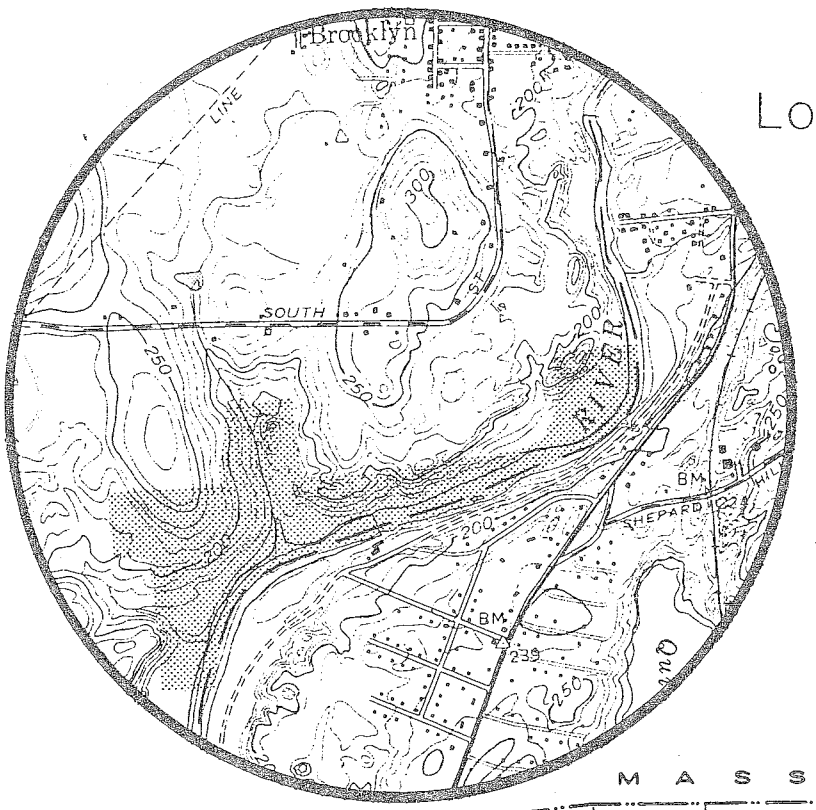


eastern connecticut resource conservation & development area

environmental review team
139 boswell avenue
norwich, connecticut 06360

Location of Study Site

DAVIS PROPERTY
BROOKLYN, CONNECTICUT



EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT

ENVIRONMENTAL REVIEW TEAM REPORT
ON
DAVIS PROPERTY
BROOKLYN, CONNECTICUT

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

The soils of the site were mapped by a soil scientist from the United States Department of Agriculture, Soil Conservation Service (SCS). Reproductions of the soil survey map, a table of soils limitations for certain land uses and a topographic map showing property boundaries were distributed to all Team members prior to their review of the site.

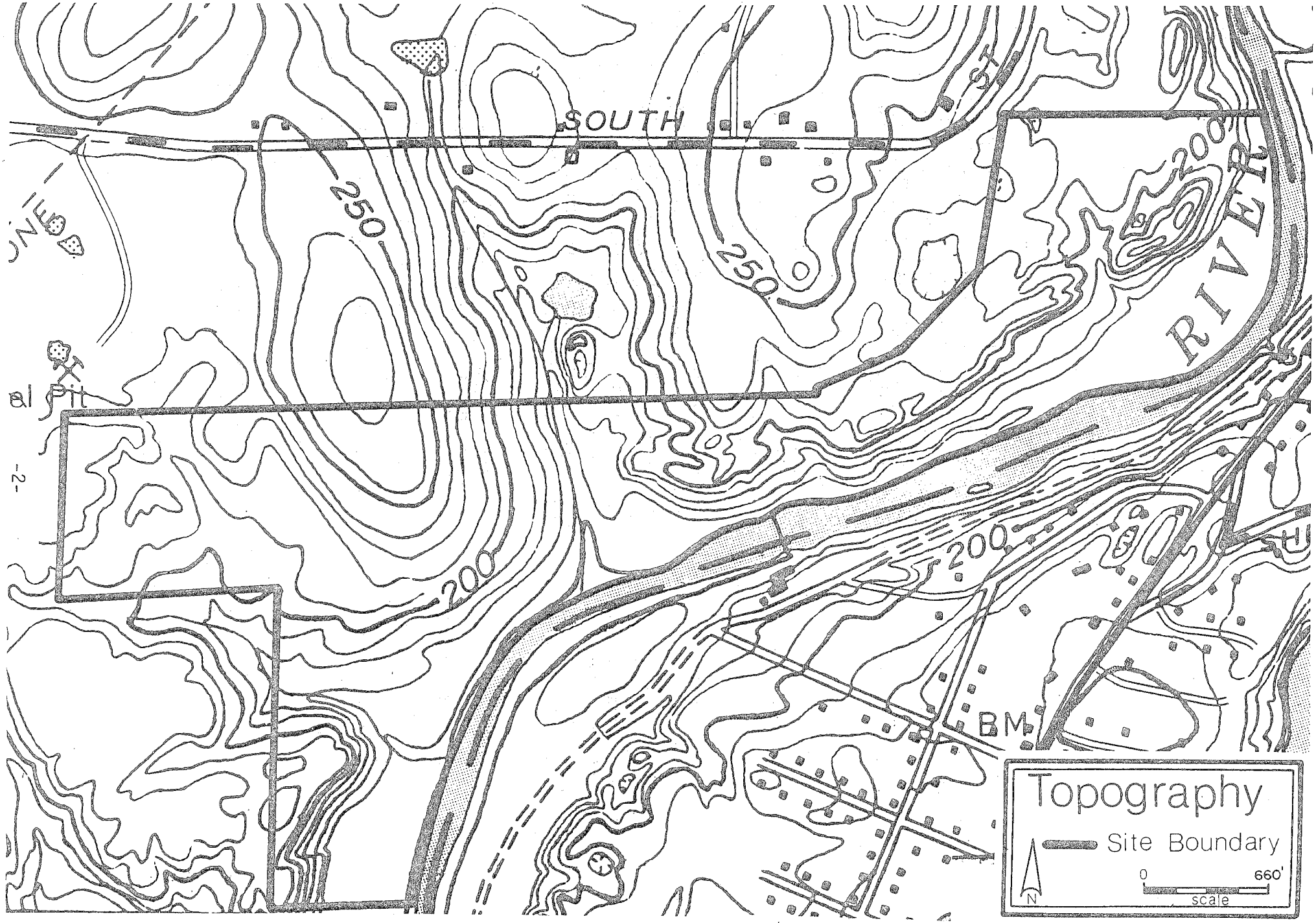
The ERT that field-checked the site consisted of the following personnel: Howard Denslow, District Conservationist, Soil Conservation Service (SCS); Ed Lukacovic, Soil Conservationist, (SCS); Michael Zizka, Geologist, Connecticut Department of Environmental Protection (DEP); Jud White, Forester, (DEP); Frank Homiski, Sanitarian, State Department of Health; Marcia Banach, Regional Planner, Northeastern Connecticut Regional Planning Agency (NECRPA); Tim Dodge, Wildlife Biologist (SCS); Loretta Johnson, Ecologist, (DEP); Andy Petracco, Recreation Specialist, (DEP); and Jeanne Shelburn, ERT Coordinator, Eastern Connecticut RC&D Area.

The Team met and field checked the site on Thursday, May 21, 1981. Reports from each contributing Team member were sent to the ERT Coordinator for review and summarization for the final report.

This report is not meant to compete with private consultants by supplying site designs or detailed solutions to development problems. This report identifies the existing resource base and evaluates its significance to the proposed development and also suggests considerations that should be of concern to the developer and the town of Brooklyn. The results of this Team action are oriented toward the development of a better environmental quality and the long-term economics of the land use.

The Eastern Connecticut RC&D Area Committee hopes that this report will be of value and assistance in making any decisions regarding this particular site.

If you require any additional information, please contact: Ms. Jeanne Shelburn, Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, 139 Boswell Avenue, Norwich, Connecticut 06360, 889-2324.


SOUTH
250
250
200
200
200
RIVER
BM
Topography
Site Boundary
0
660'
scale
N

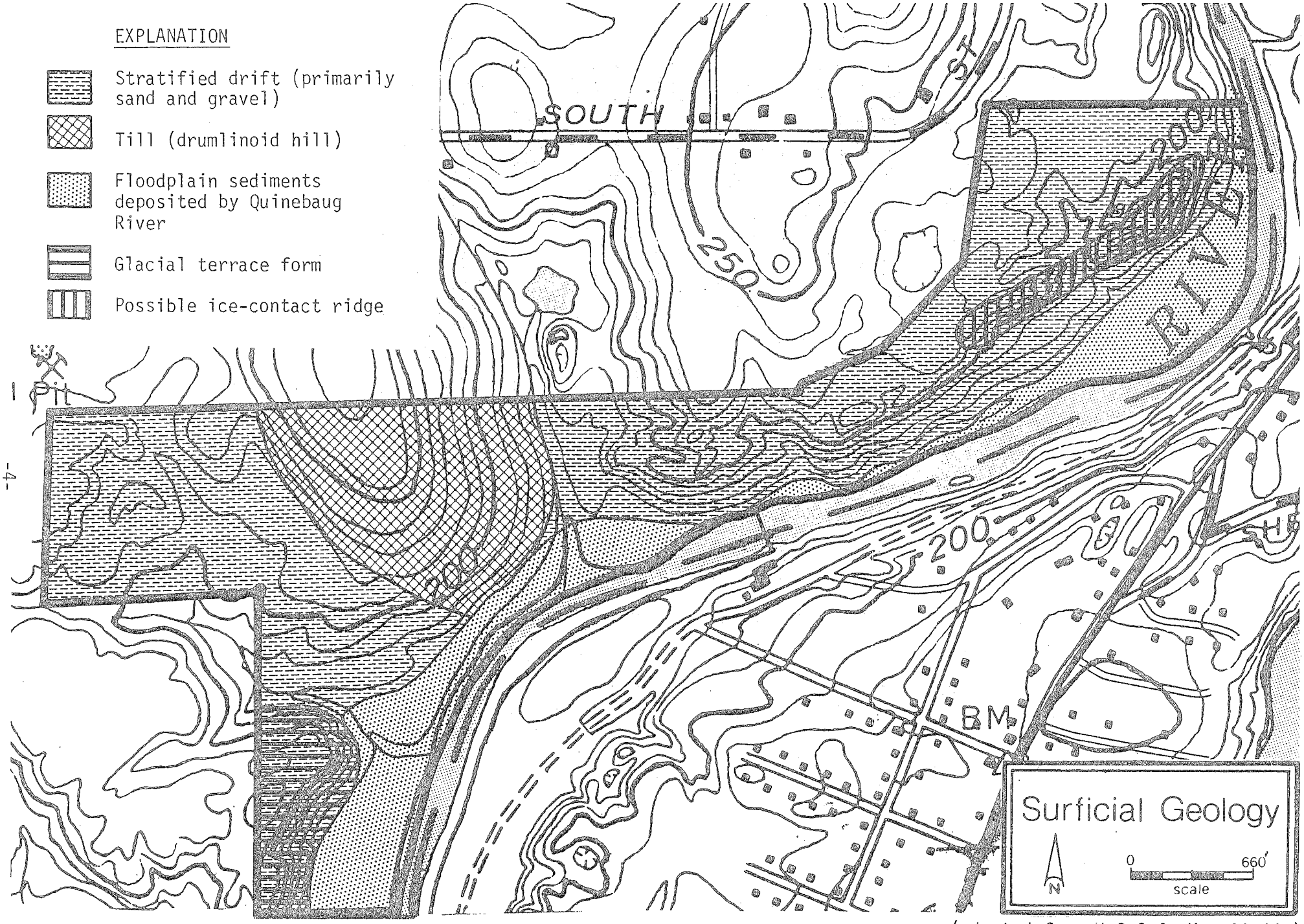
INTRODUCTION

The Eastern Connecticut Environmental Review Team was asked to prepare a resource inventory and evaluation of the Davis property for the town of Brooklyn. The town is considering the purchase of this property for open space and recreational uses. At present, Brooklyn has no town-owned open space. The Team was requested to provide natural resource information and suggestions for future recreational development if the parcel was found suitable for this use.

The property is approximately 124 acres in size and has 7,700 feet of frontage on the west side of the Quinebaug River. The site has no direct access on a local road, but a right-of-way to South Street has been maintained through an adjacent property. The Davis parcel falls into two zoning districts. The eastern section and all of the western section within 1000 feet of the river is zoned Rural Residential (R-40). The remainder of the site is zoned for industrial use (I-1). No utilities (electricity, telephone) are presently extended into the site. Public water supply and sewer are not available to this area. Scheduled public transportation is also unavailable at present.

The property is entirely wooded with pines and mixed hardwoods. The understory is sparse in most areas. Ground cover is diverse and includes such wildflower species as Solomon's Seal, False Solomon's Seal, Wake-Robin and Pink Ladyslipper. Pink Ladyslipper was abundant in the pine and beech areas of the site. The topography of the site is generally level near the river, but is gently sloping to steep to the northern section of the site. The soils were formed through an alluvial process and are basically sandy and gravelly in texture. A small stream, flowing north to south, bisects the site. Evidence of stream diversion was also found near the remains of an old mill on the Quinebaug River.

The Team has provided detailed information on each of the site's natural resources in the following sections of the report. The section prepared by the Team Recreation Specialist discusses the types of activities suited to the parcel in its present condition and those suited to the site with minor development modifications.



(adapted from U.S.G.S. Map GQ-660)

ENVIRONMENTAL ASSESSMENT

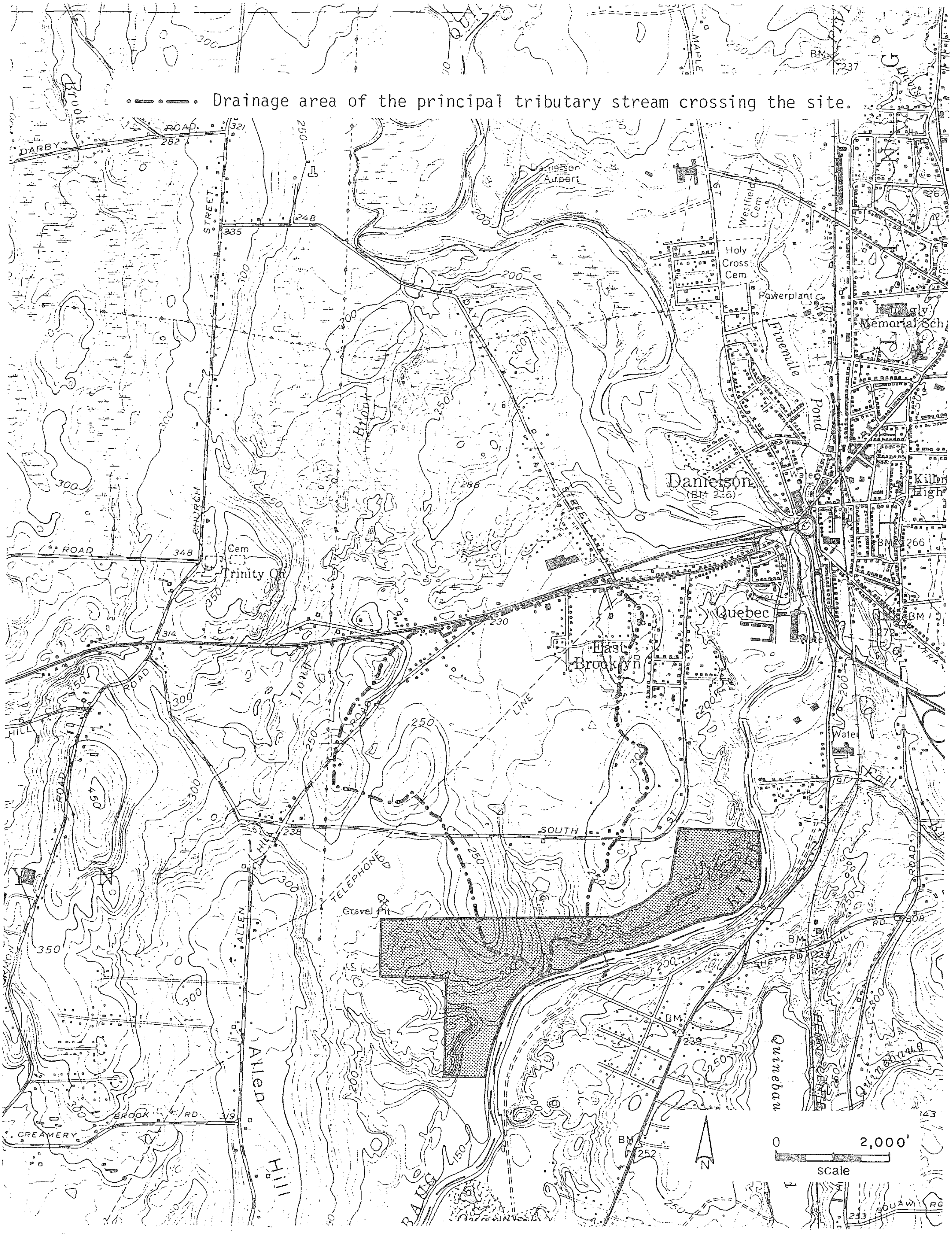
TOPOGRAPHY

The Davis property essentially consists of a narrow strip of land, approximately 7000 feet long, fronting on Quinebaug River. That portion of the tract that immediately adjoins the river is relatively flat and is subject to periodic flooding. At its widest, the flat section extends about 400 feet from the river; at its narrowest, it extends only a few feet inland. Most of the rest of the parcel consists of a dissected glacial terrace. Originally a fairly flat-topped landform, the terrace has been carved by running water, mass soil movements, and other types of erosion. Presently, high, level areas are interspersed with ravines, swales, and short valleys. A ridge, which is bisected by a ravine, separates the floodplain from a flat terrace surface in the northeastern portion of the site. The southern half of a broad, elliptical hill occupies part of the western section of the parcel. Although the hill is a distinct, somewhat incongrous topographic feature within the overall tract, it is not a feature whose unusual qualities make themselves obvious during a walking tour.

GEOLOGY

The Davis property is located in a portion of the town of Brooklyn that is encompassed by the U.S. Geological Survey's Danielson topographic quadrangle map. The survey has published a surficial geologic map (Map GQ-660, by A.D. Randall and F. Pessl, Jr.) and a bedrock geologic map (Map GQ-696, by H.R. Dixon) of the quadrangle. The bedrock map indicates that gneisses are predominant on the site. Gneisses are rocks in which thin bands of platy, flaky, or elongate minerals alternate with layers of more granular minerals. This structure resulted from intense pressures to which the rocks were subjected when they were deep within the earth's crust. The major mineral components of the gneisses on the property are quartz, andesine, hornblende, biotite, microcline, and epidote. Accessory minerals include garnet, allanite, sphene, zircon, apatite, rutile, and opaque minerals (principally iron and manganese-rich minerals). Bedrock was visible in only a few isolated locations on the parcel.

The principal surficial materials (those materials which overlie solid bedrock) on the site are stratified sands and gravels which were deposited by glacial meltwater streams. During the waning stages of the last glacial period in Connecticut, masses of ice were left in the valleys as the front of the active ice sheet retreated northward. The tremendous volumes of rock debris that had been accumulated by the ice were left in the valleys as the front of the active ice sheet retreated northward. The tremendous volumes of rock debris that had been accumulated by the ice were washed away by surging streams of meltwater and deposited in layers both adjacent to and away from the remnant ice masses. When the ice melted completely, the sediments that had been placed against it collapsed along the margin. This explains the terrace morphology that exists not only on the Davis property, but also in many portions of the Quinebaug River valley and other valleys. The best preserved (from erosion)



Drainage area of the principal tributary stream crossing the site.
DARBY ROAD
CHURCH STREET
Danielson Airport
Westfield Cem
Holy Cross Cem
Powerplant
Fivemile Pond
Danielson
Trinity Ch
Cem
Quebec
East Brooklyn
Long Brook
SOUTH ST
TELEPHONE LINE
Gravel Pit
ALLEN HILL ROAD
Allen Hill
CREAMERY BROOK RD
SHEPARD HILL RD
RIVER
Quinebaug
SQUAW RD
N
0
2,000'
scale

glacial terrace form is found in the southwestern corner of the site. In other areas, the terrace face has been more disrupted by gullying, slumping, etc. In the northeastern section of the parcel, a ridge forms a distinct break between the floodplain of Quinebaug River and the high, flat area to the north. The sediments that make up the ridge probably were deposited in a tunnel or surface fracture at the margin of an ice mass.

Sediments that were deposited directly from glacier ice (i.e., without subsequent transport and redeposition by meltwater) constitute the surficial geology of the elliptical hill in the northwestern section of the property. These sediments, known collectively as till, include clay, silt, sand, gravel, and boulders mixed in varying proportions. The upper five to ten feet of till may be relatively sandy, very stony, and friable. Where the till is deeper, it probably becomes siltier and tightly compact. Although one small bedrock outcrop was seen on the hill, it seems likely that the average thickness of the till on the site exceeds the ice sheet as it overrode the till deposit. If so, the hill could properly be classified as a drumlin, or at least a rock-cored drumlin. U.S.G.S. Map GQ-660 identifies the hill as a "streamline hill," suggesting that ice movement did indeed affect its shape.

The flat floodplain area adjoining Quinebaug River has a surface deposit of alluvium, i.e., sediments deposited in post-glacial times by Quinebaug River. These sediments are similar to the stratified glacial deposits in most respects, but they tend to be finer-grained. It has been estimated that the alluvium along Quinebaug River is as much as 25 feet thick.

WATER RESOURCES

Quinebaug River is clearly the property's principal water resource and one of its principal assets. In the vicinity of the site, the river appears to have fair to good water quality. A water-quality-management plan for the Thames River basin, of which Quinebaug River is a part, was released in 1976 by the Water Compliance Unit of DEP. The plan included a comprehensive analysis of the then-existing point-source discharges in the basin, at least to the extent that those sources were potential polluters. The plan indicated that the major problems associated with Quinebaug River were discharges originating in Massachusetts. Steps have been and are being taken to mitigate those problems, with one objective being to maintain a "B" water-quality rating in the river. Such a rating indicates that the water quality is acceptable for, among other things, bathing and other recreational uses, and for fish and wildlife habitat. This rating, however, would not assure that bathing would be practical at all times in all reaches of the river. One special consideration on the Davis property would be the proximity of a sewage-treatment plant (less than one-half mile upstream) and other wastewater discharges in the Danielson area. If bathing is a desired recreational use for the site, water quality should be tested during low flow periods, when pollutants are likely to achieve their highest concentrations. This will allow one to estimate whether bathing would be permissible under worst-case conditions.

Several small streams, both seasonal and intermittent, cross the site. The largest such stream drains an area of approximately 470 acres and enters the site from the western edge of a golf course. Apart from the golf course, the bulk of the drainage area of this stream appears to be in active agricultural

usage. It may therefore be anticipated that the nutrient levels in the stream become high during the summer, when fertilizers are heavily utilized and flows are relatively low. Minor deterioration of water quality may consequently occur in Quinebaug River near the mouth of the stream. It is doubtful that this factor would in itself seriously affect the river's potential for recreation. Any seasonal deterioration of quality in the stream itself or in the other small streams is unlikely to impair the recreational value of the site.

The stratified sand and gravel deposits may have a significant potential for public water-supply purposes. In general, the rate at which groundwater can be pumped from an aquifer other than bedrock depends upon the texture of the materials penetrated by the well and the thickness of the saturated section (the zone of the aquifer in which all spaces, or voids, are filled with water). Coarse materials, such as gravel, typically allow higher groundwater yields than fine materials, such as silt. U.S.G.S. Map GQ-660 indicates that gravel is predominant in at least the uppermost levels of the stratified overburden on the site. Nevertheless, it is probable that sand becomes the principal textural component at depths of 10 to 20 feet or more. Test drilling and pumping would be the only conclusive method of demonstrating the parcel's suitability or unsuitability for large-scale water supplies. The best present conclusion is that the property probably does have at least a moderate potential. Passive and most active recreational usage of the site would not diminish this potential. An accompanying illustration shows the areas of the site in which the saturated section of the stratified glacial deposits is inferred to be 10 feet thick or greater. These areas have the maximum potential for water-supply.

Groundwater quality is certainly an important factor in the development of any water supplies on the site. Currently available data suggests that the local groundwater quality is good. Recreational development of the parcel should not impair the quality. If, however, high yielding wells are developed on the site, some of the water withdrawn from the wells may actually be derived from Quinebaug River by a flow pattern known as "induced infiltration." Maintaining acceptable river quality may, therefore, be crucial for preserving the potential of the sand-and-gravel aquifer.

Small water supplies for recreational needs could almost certainly be obtained without major problems on the site. Both the stratified sediments and the underlying bedrock would be suitable aquifers. If the well for this purpose were located 100 feet or more from the river, induced infiltration would probably not occur to a significant extent.

SOILS

A detailed soils map of this site is included in the Appendix to this report accompanied by a chart which indicates soil limitations for various urban uses. As the soil map is an enlargement from the original 1320 feet/inch scale to 660 feet/inch, the soil boundary lines should not be viewed as absolute boundaries, but as guidelines to the distribution of soil types on the site. The soil limitation chart indicates the probable limitations for each of the soils for on-site sewerage, buildings with basements, buildings without basements, streets and parking, and landscaping. However, limitations, even though severe, do not preclude the use of the land for development. If economics permit large expenditures for land development and the intended objective is

consistent with the objectives of local and regional development, many soils and sites with difficult problems can be used. The soils map, with the publication Soil Survey, Windham County, Connecticut, can aid in the identification and interpretation of soils and their uses on this site. Know Your Land: Natural Soil Groups for Connecticut can also give insight to the development potentials of the soils and their relationship to the surficial geology of the site.

Soil series typical of this site include:

17LC Charlton-Hollis fine sandy loams, very rocky, 3 to 15 percent slopes. This complex consists of gently sloping to sloping, somewhat excessively drained and well drained soils on hills and ridges of glacial till uplands. Areas of this complex are mostly irregular in shape and range from 5 to 200 acres. Slopes are mostly complex and 100 to 200 feet long. The areas have rough surfaces with bedrock outcrops and a few narrow intermittent drainageways and small wet depressions. Stones cover 1 to 8 percent of the surface. This complex is about 55 percent Charlton soils, 20 percent Hollis soils, and 25 percent other soils and rock outcrops. Rock outcrops make up to 10 percent of this unit. The soils are in such a complex pattern that they could not be separated at the scale mapped. Typically, Charlton soils have a dark yellowish brown fine sandy loam surface layer 5 inches thick. The subsoil is yellowish brown fine sandy loam and sandy loam 20 inches thick. The substratum is light yellowish brown and light brownish gray sandy loam to a depth of 60 inches or more. Typically, Hollis soils have a dark grayish brown fine sandy loam surface layer 2 inches thick. The subsoil is yellowish brown gravelly fine sandy loam 12 inches thick and overlies hard unweathered schist bedrock. The water table is commonly below a depth of 6 feet in the Charlton soils. The runoff is medium to rapid. The soil is very strongly acid to medium acid. The Hollis soils have a low available water capacity. Permeability is moderate or moderately rapid above the bedrock. Runoff is medium to rapid. The soil is very strongly acid to medium acid. The erosion hazard is moderate to severe. Maintaining permanent vegetative cover is a suitable management practice. This complex is fairly suited to commercial woodland production. Charlton soils have better productivity than the Hollis soils. Hollis soils are droughty and have a high seedling mortality. Tree windthrow is common because of the shallow rooting depth above the bedrock. The Charlton soils are well suited to woodland wildlife habitat, but the Hollis soils are poorly suited because they are droughty. These soils are poorly suited to openland wildlife habitat because stoniness hinders the use of equipment. They are too dry for wetland wildlife habitat. This complex is fairly suited to community development. It is limited mainly by rock outcrops and the shallow depth to bedrock in the Hollis soils. Large lots are commonly needed to locate a suitable site for an on-site septic system, and the shallow depth to bedrock hinders excavations in many places. Stones and boulders need to be removed for landscaping. Establishing quick plant cover, mulching, and using siltation basins are suitable management practices to control runoff and erosion during construction. This complex is poorly suited to most recreation uses because of stoniness and the shallow depth to bedrock.

35XB Paxton very stony fine sandy loam, 3 to 8 percent slopes. This gently sloping, well drained, soil is on the tops and sideslopes of drumlins and large hills of glacial till uplands. Areas are mostly oval or irregular in shape and

range from 3 to 50 acres. Stones and boulders cover 1 to 8 percent of the surface. Typically, the surface layer is dark brown fine sandy loam 7 inches thick. The subsoil is yellowish brown and dark yellowish brown fine sandy loam 18 inches thick. The substratum is very firm to firm, olive brown fine sandy loam to a depth of 60 inches or more. This soil has a perched water table at a depth of about 2 feet for several weeks in the spring. It has a moderate available water capacity. This soil has moderate permeability in the surface layer and subsoil and slow to very slow permeability in the substratum. Runoff is medium. This soil is very strongly acid to slightly acid. This soil is well suited to commercial woodland production, and to woodland wildlife habitat. It is poorly suited to openland wildlife habitat because stoniness hinders the use of equipment. This soil is too dry for wetland wildlife habitat. This soil is fairly suited to community development. It is limited mainly by the slow to very slow permeability of the substratum. On-site septic systems require careful design and installation. Steep slopes of excavations slump when saturated. Foundation drains help prevent wet basements. Lawns are commonly wet and soggy in autumn and spring. Stones need to be removed for landscaping. Establishing quick plant cover and the use of mulch and siltation basins are suitable management practices to control runoff and erosion during construction. This soil is poorly suited to some recreational uses because of stoniness.

##60C Hinckley gravelly sandy loam, 3 to 15 percent slopes. This gently sloping to sloping, excessively drained soil is on terraces of stream valleys and on glacial outwash plains. Areas of this soil are oval or irregular in shape and range from 5 to 200 acres. Slopes are convex and undulating and are mostly less than 200 feet long. Typically, the surface layer is very dark grayish brown gravelly sandy loam 2 inches thick. The subsoil is dark yellowish brown, yellowish brown, and brownish yellow gravelly sandy loam and gravelly loam sand 16 inches thick. The substratum is pale yellow gravelly sand to a depth of 60 inches or more. The water table is commonly below a depth of 6 feet. The available water capacity is low. This soil has rapid permeability in the surface layer and subsoil and very rapid permeability in the substratum. Runoff is rapid. The soil is extremely acid to medium acid. Droughtiness is the major limitation. The erosion hazard is moderate. Minimum tillage and the use of cover crops are suitable management practices to control runoff and erosion. This soil is fairly suited to commercial woodland production. It has low productivity. Seedling mortality is high because of droughtiness. This soil is poorly suited to woodland and openland wildlife habitat because it is droughty. It is too dry for wetland wildlife habitat. This soil is well suited to community development, but on-site spetic systems pollute the groundwater in places. Steep slopes of excavations are unstable. Lawns and gardens need watering during summer. Establishing quick plant cover and the use of mulch and siltation basins are suitable management practices to control runoff and erosion during construction. This soil is poorly suited to most recreational uses because of the gravelly surface and steepness of slopes.

60D Hinckley gravelly sandy loam, 15 to 40 percent slopes. This moderately steep to very steep, excessively drained soil is on sideslopes and terrace breaks of stream valleys and outwash plains. Areas of this soil are long and narrow or irregularly shaped and range from 5 to 60 acres. Slopes are convex or undulating and are mostly less than 300 feet long. Typically, the surface

layer is very dark grayish brown gravelly sandy loam about 2 inches thick. The subsoil is dark yellowish brown, yellowish brown, and brownish yellow gravelly sandy loam and gravelly loamy sand 16 inches thick. The substratum is pale yellow gravelly sand to a depth of 60 inches or more. The water table is commonly below a depth of 6 feet. The available water capacity is low. This soil has rapid permeability in the surface layer and subsoil and very rapid permeability in the substratum. Runoff is rapid. The soil is extremely acid to medium acid. The erosion hazard is severe. Maintaining permanent vegetative cover is a suitable management practice to control runoff and erosion. This soil is fairly suited to commercial woodland production because it is droughty. Seedling mortality is high. Steep slopes hinder the use of some harvesting equipment. This soil is poorly suited to woodland and openland wildlife habitat because it is droughty. It is too dry for wetland wildlife habitat. This soil is poorly suited to community development. The main limitation is the steep slope. Onsite septic systems pollute the groundwater in places. Steep slopes of excavation are unstable. Establishing quick plant cover and the use of mulch and siltation basins are suitable management practices to control runoff and erosion during construction. This soil is poorly suited to recreational uses because of the steep slopes.

#67A Windsor loamy sand, 0 to 3 percent slopes.
#67B Windsor loamy sand, 3 to 8 percent slopes. These excessively drained soils are on glacial outwash plains and terraces. Areas are irregular in shape. Typically, the surface layer is dark brown loamy sand 7 inches thick. The subsoil is dark yellowish brown loamy sand 25 inches thick. The substratum is light olive brown sand to a depth of 60 inches or more. This soil does not commonly have a water table above a depth of 6 feet. It has a low available water capacity. This soil has rapid or very rapid permeability. Runoff is slow. The soil is very strongly acid to medium acid in the surface layer and subsoil and very strongly acid to slightly acid in the substratum. This soil is well suited for cultivated crops when irrigated. This soil is droughty and irrigation is needed. It warms up early in the spring and is easy to work. When irrigated, this soil is well suited to most crops commonly grown in the area. Minimum tillage, use of cover crops, and returning crop residue to the soil are suitable management practices. This soil is poorly suited to commercial woodland production because it is droughty. Seedling mortality is high and productivity is low. This soil is fairly suited for woodland and openland wildlife habitat. Droughtiness is the main limitation. This soil is too dry for wetland wildlife habitat. This soil is well suited to community developments. Onsite septic systems are easy to install, but they pollute the groundwater in places. Steep slopes of excavations are unstable. Lawns and gardens need water during the summer. The steepness of slope is a moderate limitation when this soil is used for small commercial developments. Establishing quick plant cover is a suitable management practice during construction. This soil is poorly suited for most recreational uses because it is droughty and too sandy. It does not produce a grass cover than can withstand heavy foot traffic.

##70A Merrimac sandy loam, 0 to 3 percent slopes.
##70B Merrimac sandy loam, 3 to 8 percent slopes. This somewhat excessively drained soil is on terraces and outwash plains of stream valleys. Areas are irregular in shape. Typically, the surface layer is dark brown sandy loam 8 inches thick. The subsoil is yellowish brown sandy loam and loamy sand 16

inches thick. The substratum is yellowish brown gravelly sand and stratified sand and gravel to a depth of 60 inches or more. The water table is commonly below a depth of 6 feet. The available water capacity is moderate. This soil has moderately rapid permeability in the surface layer and upper part of the subsoil, moderately rapid or rapid permeability in the lower part of the subsoil, and rapid permeability in the substratum. Runoff is slow to medium. The soil is extremely acid to medium acid. This soil is well suited to cultivated crops, but it tends to be droughty during extended dry periods. This soil has a moderate erosion hazard. It is easy to maintain in good tilth. The use of cover crops and minimum tillage are suitable management practices to control runoff and erosion. This soil is fairly suited to commercial woodland production. Droughtiness causes a moderate seedling mortality rate. This soil is fairly suited to woodland and openland wildlife habitat and it is limited mainly by droughtiness. This soil is too dry for wetland wildlife habitat. This soil is well suited to community development, but the rapid permeability of the substratum causes pollution of the groundwater in places. Steep slopes of excavations are unstable. Lawns and gardens need watering during the summer. Establishing quick plant cover and the use of mulch and siltation basins are suitable management practices to control runoff and erosion during construction. This soil is well suited to most recreational uses.

#455A Sudbury sandy loam. This nearly level to gently sloping, moderately well drained soil is in slight depressions of outwash plains and stream terraces. Areas are mostly oval or irregular in shape. Typically, the surface layer is dark brown sandy loam 10 inches thick. The subsoil is mottled, yellowish brown and strong brown sandy loam, gravelly sandy loam and gravelly loamy sand 18 inches thick. The substratum is light brownish gray and dark gray stratified sand and gravel to a depth of 60 inches or more. This soil has a seasonal water table at a depth of about 20 inches from autumn to spring. It has a moderate available water capacity. This soil has moderately rapid permeability in the surface layer and subsoil and rapid permeability in the substratum. Runoff is slow. This soil is very strongly acid to medium acid. This soil is well suited to cultivated crops. It is limited mainly by wetness and is slow to dry out and warms up in the spring. Artificial drainage helps dry this soil earlier in the spring, but even if drained, it remains wet for several days after heavy rains. Minimum tillage and use of cover crops are suitable management practices. This soil is well suited to commercial woodland production and to woodland and openland wildlife habitat. It is poorly suited to wetland wildlife habitat. This soil is fairly well suited to community developments. Wetness is the major limitation. Steep slopes of excavations are unstable. Foundation drains help prevent wet basements. Lawns are wet and soggy in autumn and spring. Onsite septic systems need special design and installation, and sites generally require filling. In places, onsite septic systems pollute the ground water. Establishing quick plant cover and mulching are suitable management practices to control erosion. This soil is fairly suited to most recreational uses.

#695A Agawam fine sandy loam, 0 to 3 percent slopes. This nearly level, well drained, soil is on outwash plains and stream terraces. Areas of this soil are irregular in shape or are long and narrow and are mostly 4 to 20 acres. Typically, the surface layer is dark grayish brown fine sandy loam 10 inches thick. The subsoil is yellowish brown and strong brown fine sandy loam 20

inches thick. The substratum is very pale brown fine sand and sand to a depth of 60 inches or more. The water table is commonly below a depth of six feet. The available water capacity is moderate. This soil has moderately rapid permeability in the surface layer and upper part of the subsoil, moderately rapid or rapid permeability in the lower part of the subsoil, and rapid permeability in the substratum. Runoff is slow. This soil is strongly acid to slightly acid. The hazard of erosion is slight and controlling runoff and erosion is fairly easy. The use of cover crops and minimum tillage are suitable management practices. This soil is well suited to commercial woodland production and for producing openland and woodland wildlife habitat. This soil is too dry to develop wetland wildlife habitat.

This soil is well suited to community development. Onsite septic systems will function with normal design and installation; however, they will pollute the groundwater in places. Steep slopes of excavations are unstable. Establishing quick plant cover and the use of mulch are suitable management practices during construction. This soil is well suited to most recreational uses.

*43M Ridgebury, Leicester & Whitman extremely stony fine sandy loams. This unit consists of nearly level, poorly drained and very poorly drained soils in depressions and drainageways of glacial till uplands. Areas are mostly long and narrow or irregular in shape and range from 5 to 150 acres. Slopes range from 0 to 5 percent and are mostly 100 to 300 feet long. Stones cover 8 to 25 percent of the surface. About 40 percent of the mapped acreage of this unit is Ridgebury soils, 35 percent is Leicester soils, 15 percent is Whitman soils, and 10 percent is other soils. Some areas of this unit consist of one of these soils and some areas consist of two or three. The soils of this unit were mapped together because they have no significant differences in use and management. Typically, Ridgebury soils have a very dark brown fine sandy loam surface layer 8 inches thick. The subsoil is mottled, light brownish gray fine sandy loam 8 inches thick. The substratum is very firm to firm, grayish brown and light brownish gray fine sandy loam and sandy loam to a depth of 60 inches or more. Typically, Leicester soils have a very dark brown fine sandy loam surface layer 7 inches thick. The subsoil is mottled, grayish brown and light olive brown fine sandy loam 23 inches thick. The substatum is mottled, light olive brown and grayish brown sandy loam to a depth of 60 iches or more. Typically, Whitman soils have a very dark gray fine sandy loam surface layer 9 inches thick. The subsoil is gray, mottled fine sandy loam 5 inches thick. The substratum is mottled, light olive gray fine sandy loam and sandy loam to a depth of 60 inches or more. Ridgebury and Leicester soils have a seasonal water table at a depth of about 10 inches from fall through spring. It has a moderate available water capacity. This soil has moderate or moderately rapid permeability. Runoff is slow. The soil is very strongly acid to medium acid. Whitman soils have a water table at or near the surface from fall through spring. It has a moderate available water capacity. This soil has moderate or moderately rapid permeability in the surface layer and upper part of the substratum, and slow to very slow permeability in the lower part of the substratum. Runoff is slow. The soil is very strongly acid to slightly acid. The soils of this unit are too stony for cultivation. Stoniness makes the use of farming equipment impractical. This unit is fairly suited to commercial woodland production. Stoniness and wetness hinder the use of harvesting equipment. Seedling mortality is high and windthrow is common because of the wetness. Ridgebury and Leicester soils are fairly suited to woodland wildlife habitat, but Whitman soils are

poorly suited. These soils are poorly suited to openland wildlife habitat because stoniness hinders the use of equipment. These soils are well suited to wetland wildlife habitat where slopes are less than 1 percent. The soils of this unit are poorly suited to community development. Wetness and the slow to very slow permeability are the major limitations. Steep slopes of excavations slump when saturated. Areas used for onsite septic systems require extensive filling. Surface stones need to be removed for landscaping. Lawns are wet and soggy most of the year. The soils of this unit are poorly suited to recreation because of stoniness and wetness.

*91 Adrian and Palms mucks. This unit consists of nearly level, very poorly drained organic soils in depressions and along streams of outwash plains and glacial till uplands. Areas are mostly oval or long and narrow and range from 5 to 40 acres. Slopes range from 0 to 2 percent, but are mostly less than 1 percent. About 45 percent of the mapped acreage of this unit is Adrian soils, 35 percent is Palms soils, and 20 percent is other soils. Areas of this unit consist of either Adrian soils, Palms soils, or both. The soils of this unit were mapped together in this survey area because they react similarly to most uses and management. Typically, Adrian soils have a black and very dark gray muck surface layer 12 inches thick. The subsurface layer is black muck 21 inches thick. The substratum is gray gravelly sand to a depth of 60 inches or more. Typically, Palms soils have a black muck surface layer 9 inches thick. The subsurface layer is very dark brown and black muck 21 inches thick. The substratum is gray and grayish brown silt loam and fine sandy loam to a depth of 60 inches or more. These soils are wet most of the year and are ponded for several weeks from fall through spring and after heavy summer rains. They have a high available water capacity. Adrian soils have moderately rapid permeability in the organic layers and rapid permeability in the substratum. Palms soils have moderately rapid permeability in the organic layers and moderate or moderately slow permeability in the substratum. Runoff is very slow or the soils are ponded. These soils are strongly acid to medium acid in the organic layers and medium acid to slightly acid in the substratum. The soils of this unit are not suited to cultivated crops because of wetness. Most areas are difficult to drain. If drained, the proper water table level should be maintained to minimize subsidence and loss of organic material. This unit is poorly suited to commercial woodland production. Wetness severely limits the use of equipment. Seedling mortality is high. These soils have a severe windthrow hazard; the trees are shallow rooted because of the high water table. The soils in this map unit are poorly suited to producing woodland wildlife habitat and openland wildlife habitat. They are well suited to wetland wildlife habitat. These soils are poorly suited for community development because of wetness, low strength of the organic layers, and flooding or ponding. Onsite septic systems cannot be feasibly used on these soils. For most uses, the removal of the organic layers is not feasible. If fill is placed on top of the organic layers, the fill will settle over a period of several years. The soils of this unit cannot feasibly be used for most recreational uses because of wetness and the poor stability of the organic layers.

##*466 Walpole sandy loam. This nearly level, poorly drained soil is in depressions and drainageways of stream terraces and outwash plains. Areas are mostly irregular in shape and range from 3 to 15 acres. Slopes range from 0 to 3 percent. Typically, the surface layer is very dark brown sandy loam 6 inches thick. The subsoil is mottled, dark grayish brown and grayish brown sandy loam and gravelly sandy loam 17 inches thick. The substratum is mottled,

light brownish gray gravelly loamy sand and gravelly sand to a depth of 60 inches or more. This soil has a seasonal water table at a depth of about 10 inches during autumn and spring. It has a moderate available water capacity. This soil has moderate or moderately rapid permeability in the surface layer and subsoil, and rapid or very rapid permeability in the substratum. Runoff is slow. The soil is very strongly acid to medium acid. This soil is fairly suited to cultivated crops when drained. The main limitation is wetness. This soil dries out and warms up slowly in the spring and artificial drainage is needed. Even when drained, this soil remains wet for several days after heavy rains, restricting the use of farming equipment. Minimum tillage and the use of cover crops are suitable management practices. This soil is fairly suited to commercial woodland production, but wetness causes high seedling mortality and restricts the use of some harvesting equipment during the wet seasons. Tree windthrow is common. This soil is fairly suited to the development of woodland and openland wildlife habitat and wetness is the main limitation. This soil is well suited to the development of wetland wildlife habitat. This soil is poorly suited to community development because of wetness. On-site septic systems require special design and installation and sites generally require extensive filling. Steep slopes of excavation are unstable. If suitable outlets are available, artificial drains can be used to help prevent wet basements. Lawns are wet and soggy in autumn and spring and after heavy summer rains. This soil is poorly suited to most recreational uses because of wetness.

#*806 Occum fine sandy loam. This nearly level, well drained soil is on floodplains along major streams and their tributaries. Areas are long and narrow or irregular in shape and range from 5 to 30 acres. Typically, the surface layer is dark grayish brown fine sandy loam 8 inches thick. The subsoil is dark yellowish brown and yellowish brown fine sandy loam 27 inches thick. The substratum is yellowish brown and dark yellowish brown loamy fine sand to a depth of 60 inches or more. This soil has a water table that is commonly below a depth of 6 feet. The soil is subject to frequent flooding, mainly from fall to spring. The available water capacity is moderate. This soil has moderately rapid permeability in the surface layer and subsoil and rapid permeability in the substratum. Runoff is slow. This soil is very strongly acid to medium acid. This soil is well suited to cultivated crops. It is easy to maintain in good tilth. This soil seldom floods during the growing season. Minimum tillage and the use of cover crops are suitable management practices. This soil is well suited to commercial woodland production and to woodland and openland wildlife habitat. It is too dry for wetland wildlife habitat. This soil is poorly suited to community development because it is subject to frequent flooding. This soil is poorly suited to most types of recreation because it floods frequently. It can be used for ballfields and playgrounds during the summer.

#*815 Pootatuck fine sandy loam. This nearly level, moderately well drained soil is on floodplains along the major streams and their tributaries. Areas are irregular or long and narrow in shape and range from 15 to 45 acres. The slope ranges from 1 to 3 percent. Typically, the surface layer is very dark grayish brown fine sandy loam 5 inches thick. The subsoil is mottled dark brown, yellowish brown, and brown fine sandy loam and sandy loam 22 inches thick. The substratum is olive brown and grayish brown sand to a depth of 60 inches or more. This soil has a seasonal water table at a depth of about 20 inches from fall through spring. It is subject to frequent flooding, mainly from autumn to

spring. The available water capacity is moderate. This soil has moderate or moderately rapid permeability in the surface layer and subsoil and moderately rapid or rapid permeability in the substratum. Runoff is slow. The soil is very strongly acid to medium acid. This soil is well suited to cultivated crops. It is limited mainly by the seasonal high water table. This soil seldom floods during the growing season. It dries out and warms up slowly in the spring, which sometimes delays spring planting. Minimum tillage and the use of cover crops are suitable mangement practices. This soil is well suited to commercial woodland production and to woodland wildlife habitat. It is fairly suited to openland wildlife habitat. This soil is too dry for wetland wildlife habitat. This soil is poorly suited to community development. Flooding is the major limitation. Sediment deposited by floodwaters can damage lawns, shrubs, and other types of landscaping. Steep slopes of excavations are unstable. This soil is poorly suited to many recreational uses because of flooding and wetness.

*823 Saco silt loam. This nearly level, very poorly drained soil is on low areas of floodplains along major streams and their tributaries. Areas are mostly long and narrow or irregular in shape and range from 10 to 150 acres. Slopes are 0 to 2 percent. Typically, the surface layer is black silt loam 10 inches thick. The subsurface is mottled, black silt loam 4 inches thick. The substratum from 14 to 41 inches is mottled, dark gray silt loam and from 41 to 60 inches or more is gray stratified sand and gravel. This soil has a water table at or near the surface during most of the year and is subject to frequent flooding. It has a high available water capacity. This soil has moderate permeability in the surface layer and the loamy part of the substratum, and rapid or very rapid permeability in the sandy substratum. Runoff is slow or ponded. The soil is strongly acid to medium acid above a depth of 40 inches and medium acid to slightly acid below 40 inches. This soil is not suited to cultivated crops because of wetness and flooding. Most areas are difficult to drain. Frequent flooding damages or destroys some crops. Wetness severely restricts the use of farming equipment. This soil is not suited to commercial woodland production and it is poorly suited to woodland and openland wildlife habitat because of wetness and flooding. It is well suited to wetland wildlife habitat. This soil is not suited to community development. It is limited mainly to wetness and flooding. Use of this soil for community development is not feasible unless the soil is extensively filled. This soil is poorly suited for recreational uses because of wetness and flooding.

*825 Rippowam fine sandy loam. This nearly level, poorly drained soil is on the lowest floodplain areas along major streams and their tributaries. Areas are mostly long and narrow and range from 5 to 100 acres. Typically, the surface layer is very dark gray fine sandy loam 7 inches thick. The subsoil is mottled, dark brown, grayish brown, and dark grayish brown fine sandy loam 28 inches thick. The substratum is grayish brown and gray gravelly sand to a depth of 60 inches or more. This soil has a seasonal water table at a depth of about 10 inches from autumn through spring. It is subject to frequent flooding, mainly from autumn to spring. This soil has a moderate available water capacity. It has moderate or moderately rapid permeability in the surface layer and subsoil and rapid or very rapid permeability in the substratum. Runoff is slow. The soils is very strongly acid to medium acid. This soil is fairly suited to cultivated crops when drained. Wetness is the major limitation. This

soil dries out slowly in the spring and often delays planting of crops. Areas that cannot be drained are poorly suited for cultivation. This soil is fairly suited to commercial woodland production, but wetness causes high seedling mortality and restricts the use of some harvesting equipment during wet seasons of the year. This soil is fairly suited to woodland and openland wildlife habitat. It is limited mainly by wetness. This soil is well suited to wetland wildlife habitat. This soil is poorly suited to community development. Frequent flooding and the seasonal high water table are the major limitations. Areas used for onsite septic systems require extensive filling systems and require special design and installation. Steep slopes of excavations are unstable. In places, onsite septic systems pollute the groundwater. Lawns are wet and soggy from autumn to spring, and sediment deposited by floodwater can damage lawns, shrubs, and other kinds of landscaping. This soil is poorly suited to recreational uses because of wetness and flooding.

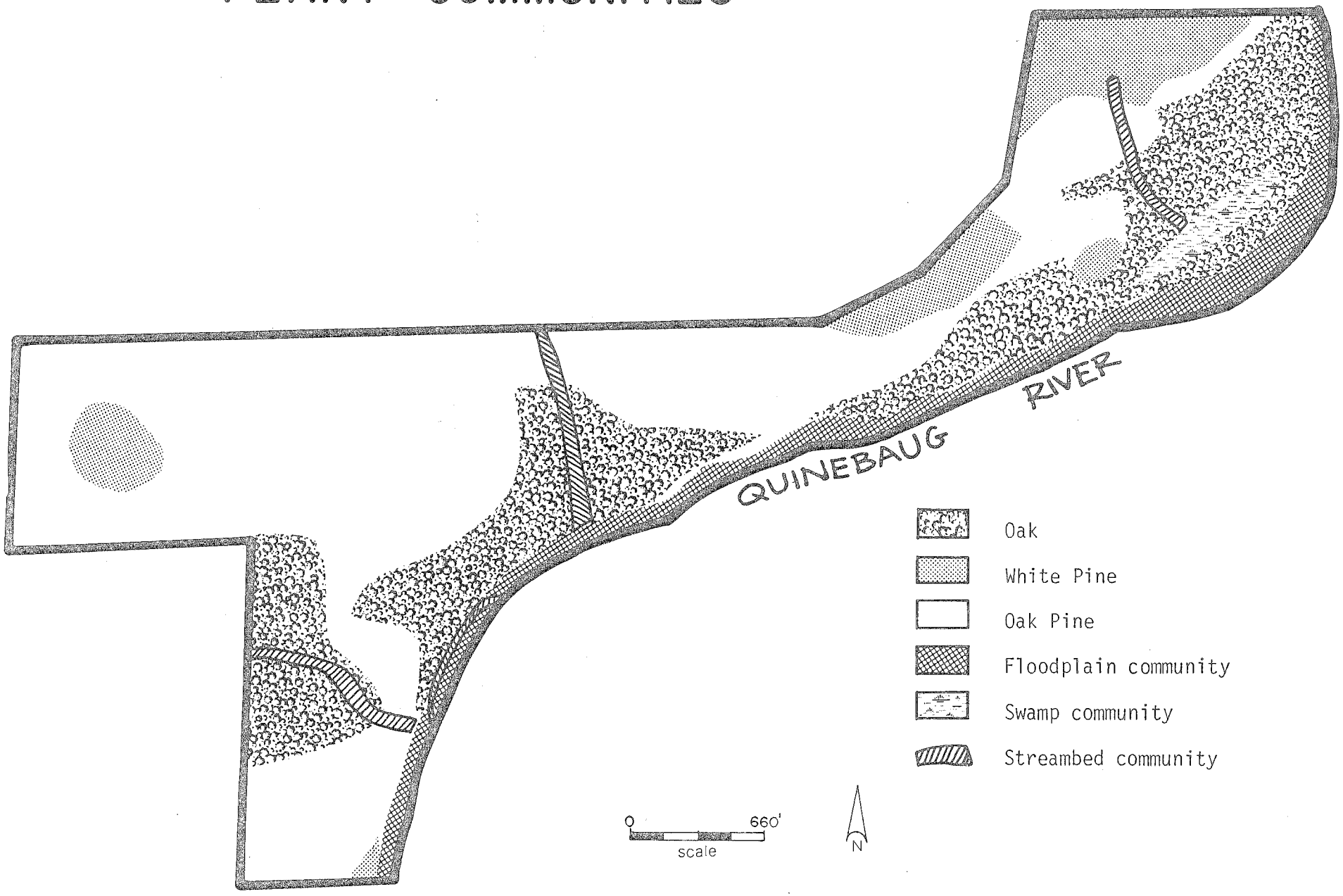
\# Prime Farmland
\## Additional Farmland of Statewide Importance
* Designated wetland soil by P.A. 155

The majority of the soils present are well drained loamy and sandy soils naturally found on glacial outwash plains and major stream or river terraces. A few upland soils such as the Charlton-Hollis complex (17LC) and Paxton (35XB) are found at a distance from the Quinebaug. Approximately 75 percent of the property contains soils recognized as being prime for agricultural uses. Of course, this makes them valuable for other uses also since prime soils have few limitations which cannot be overcome with appropriate conservation measures. Locations with these prime soils might be considered for community garden plots, or renting areas to farmers, if and when they were cleared. Wetland soils 43M and 91, as shown on the soils map, border intermittent and perennial streams flowing to the Quinebaug. A third intermittent stream flows through a draw in well drained soil, then through floodplain wetlands 823 (Saco) and 815 (Pootatuck) to the river. It is noteworthy that the wetland soils associated with the river's floodplain, Pootatuck (815) and Occum (806) are also prime agricultural land. They will flood, and are recognized on the Flood Hazard Boundary Maps prepared by the U.S. Department of Housing and Urban Development for Brooklyn. The areas where these soils are located would best be used for canoe camping, beach, or fishing. The wetland soil, SACO (823) is also subject to river flooding. This soil (823) and wetland soils 43M and 91 would best be left alone for wildlife habitat, natural stream buffer corriders, and for flooding relief.

PLANT COMMUNITIES

The 124-acre Davis parcel is situated on the west bank of the Quinebaug River, between the river and South Street in Brooklyn, Connecticut. The terrain ranges from an undulating gentle slope to relatively flat along the floodplain of the Quinnebaug River. Elevation varies from 260 ft. at the highest sand hill to 150 ft. along the river. It lies within the Northeast hills ecoregion of the northern hills-central hardwoods-white pine zone.

PLANT COMMUNITIES



The highly irregular topography of the Davis parcel is largely the result of the Wisconsin glaciation. The sand and gravel deposits which comprise the surficial material were sorted and laid down along the Quinebaug by meltwater streams which drained the melting ice mass. The irregularities in the landscape are derived from the sand and gravel filling in crevices in the ice and then later collapsing after the ice had melted. The narrow, flat floodplain has developed in recent geologic times as the Quinebaug River depositing a thin layer of alluvium on its banks during spring freshet. The sandy glaciofluvial surficial material gives rise to rather droughty soils, while the floodplain alluvium is very fertile.

Oak, red, black and white (Q.rubra, Q.velutina, Q.alba) and white pine (Pinus strobus) comprise the dominant element on the hills which slope down to the Quinebaug River. Pine and oak occur together in mixed stands over much of the Davis parcel, as well as growing in pure stands. The oak-pine community extends to the Quinebaug River, with the exception of a very narrow band of floodplain vegetation along the immediate borders of the river. The diversity and luxuriant plant growth on the narrow stream beds of several intermittent streams is worthy of mention, although the stream bank vegetation comprises a miniscule amount of the total area.

Oak Community

Black oak and red oak dominate the vegetation of much of the slopes, associated with white oak and scarlet oak (Q.coccinea) on the very dry ridges. The understory is comprised of saplings of tree species including oak, pine, mockernut and pignut hickory (Carya tomentosa, C.glabra), white ash (Fraxinus americana), red maple (Acer rubrum), chestnut snags (Castanea dentata), and sugar maple (Acer saccharum). Trees limited to understory size, such as hophornbean (Ostrya virginiana) and musclewood (Carpinus caroliniana), are also present.

Low bush blueberry (Vaccinum vacillans) characteristically comprises the shrub layer of the oak community. Low bush blueberry is replaced by or mixed with huckleberry (Gaylussacia baccata) on ridges and maple-leaved viburnum (Viburnum acerifolium) on moister sites (i.e. mid-lower slopes). Other shrubs found in this community include hazlenut (Corylus americana), shadbush (Amelanchier sp), hawthorn (Crataegus sp) and flowering dogwood (Cornus florida) on middle-lower slopes.

The herbaceous layer of the oak community is generally characterized by low species diversity, due to dry and acidic conditions. The following are some of the herbs typically found in this community: pink lady's slipper (Cypripedium acaule), striped wintergreen (Chimaphila maculata), Pennsylvania sedge (Carex pensylvanica), whorled loosestrife (Lysimachia quadrifolia), Canada mayflower (Maianthemum canadense), clubmosses (Lycopodium obscurum, L.complanatum), bracken fern (Pteridium aquilinum), pipsisewa (Chimaphila umbellata), shinleaf (Pyrola spp.), starflower (Trientalis borealis), wild sarsaparilla (Aralia nudicaulis), cow wheat (Melampyrum linare), and several kinds of mosses (Polytrichum spp.).

As the moisture regime improves downslope toward the flood plain or stream, there is a marked increase in species and an improvement in growth. Ferns,

commonly cinnamon (Osmunda cinnamomea), tapering (Dryopteris noveboracensis), and interrupted (O.claytoniana) become more abundant and often form a belt before a stream or the flood plain.

White Pine

White pine occurs in pure stands of small size scattered throughout the parcel. The occurence of pure stands may be correlated with the past agricultural use of the land. White pine often seeds in on open, dry abandoned farmland or pasture and does extremely well in competing with hardwood pioneer species.

Understory, shrub, and herb strata are generally absent or poorly developed due to the effects of shading and the high acidity of the soil. However, where there are breaks in the pine canopy, species typical of dry, sandy conditions, such as are found in the oak community, begin to emerge. Canada mayflower, striped wintergreen, pink lady's slipper and wild sarsaparilla are particularly abundant in the sunflecks.

Oak-Pine Community

The components of the oak-pine community are basically the same as for the oak community. However, the shrub and herb layers may be locally depauperate in places where pine is particularly abundant.

The occurrence of the oak-pine community may be correlated with the juxta position of the community with respect to pure stands of white pine. The pure stands of white pine are an excellent seed source and probably represent the center for white pine expansion into the oak community.

Streambank Community

The banks and bed of the several meandering intermittent streams represents a small area, but a floristically diverse and nutrient-rich community, in contrast with the relatively sterile oak and pine forests.

The waters of the stream, carrying detritus from other ecosystems, slows down and deposits its load on the stream bank and stream bed. Thus streams and their margins provide a moist and fertile site for plant growth.

Red maple (Acer rubrum) and elm (Ulmus glabra) frequently grow in association with these intermittent streams. Shrubs often form dense tangles on the bank, dominated by spice bush (Lindera benzoin), arrowwood (Viburnum recognitum), winterberry (Ilex verticillata) and dogwoods (Cornus stolonifera, C. amomum). The herbaceous layer is especially luxuriant and diverse including the following: skunk cabbage (Symplocarpus foetidus), jewelweed (Impatiens capensis), spinulose wood fern (Dryopteris spinulosa), marsh fern (D.Thelypteris), Virginia bugleweed (Lycopus virginicus), tall meadow rue (Thalictrum polygamum), false nettle (Bochmerica cylindrica), Jack-in-pulpit (Arisaema triphyllum), clearweed (Pilea pumila), violets (Viola spp.), peat moss

(Sphagnum spp.) and many grasses and sedges.

Flood Plain

The flood plain is generally very narrow, ranging from a few feet to several hundred feet in width. Consequently, the typical flood plain vegetation is poorly represented on the flood plain of this section of the Quinebaug River.

The Quinebaug flood plain vegetation varies from a narrow shrub border to red maple forest to post-agricultural meadow. The shrub border is comprised of alders (Alnus rugosa), willow (Salix sp), dogwoods (Cornus amomum, C.stolonifera) and saplings of red maple (Acer rubrum), silver maple (Acer saccharinum) and sycamore (Platanus occidentalis)

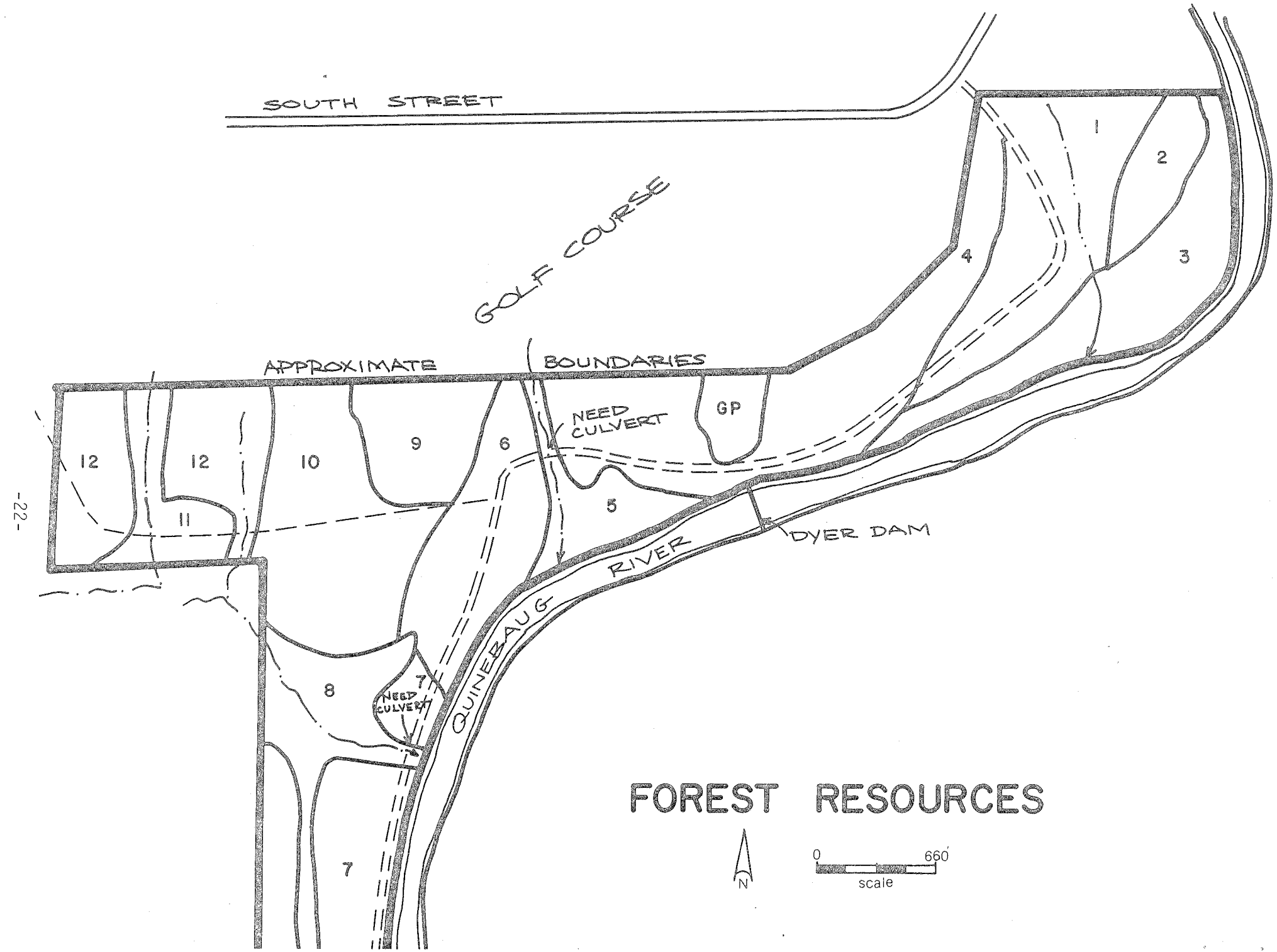
The red maple flood plain forest is characterized by a poorly developed shrub layer and luxuriant herb layer. Herbaceous species in the red maple flood plain forest include ferns, sensitive (Onoclea sensibilis), interrupted (Osmunda claytoniana), lady fern (Athyrium felix-femina), tall meadow rue (Thalictrum polygamum), goldenrods (Solidago spp), false nettle (Boehmeria cylindrica), sedges (Carex crinata, Carex intumescens, Carex spp.) and wild rye (Elymus virginicus) and other grasses.

North of the old dam site, the flood plain takes on the appearance of a meadow, correlated with past agricultural use of the fertile flood plain. The meadow is dominated by canary reed grass (Phalaris arundinacea) and sedges (Carex sp) interspersed with thickets of dogwoods (Cornus spp) and meadow sweet (Spiraea latifolia).

An interesting backwater red maple swamp has developed along the flood plain where water from spring freshets becomes trapped. The canopy is comprised of red maple, elm (Ulmus americana), and green ash (Fraxinus pennsylvanica). The shrub strata becomes thick in places dominated by alders (Alnus rugosa), spicebush (Lindera benzoin), arrowwood (Viburnum recognitum), dogwoods (Cornus spp.), and winterberry (Ilex verticillata). The herbaceous layer is particularly diverse including a colony of rein orchids (Habenaria sp), jewelweed (Impatiens capensis), skunk cabbage (Symplocarpus foetidies), peat moss (Sphagnum spp.), marsh fern (Dryopteris thelypteris), cinnamon fern (Osmunda cinnamomea), marsh bedstraw (Galium palustre), crested woodfern (Dryopteris cristata), Jack-in-the-pulpit (Arisaema atrorubens), spinulose woodfern (Dryopteris spinulosa), and bittercress (Cardamine pennsylvanica).

FOREST RESOURCES

The proposed acquisition of 125± acres known as the Davis property is entirely wooded except for a few, very narrow strips along the Quinebaug River. For all practical purposes the property could be divided into four general vegetation types: hardwood swamp, mixed hardwood, white pine, pine/hardwood.


SOUTH STREET
GOLF COURSE
APPROXIMATE
BOUNDARIES
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NEED CULVERT
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FOREST RESOURCES
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scale

For discussion purposes the property has been divided into 12 divisions based on tree stand characteristics. Areas 3, 5, and 8 are moist areas predominately occupied by hardwood species. The remaining nine areas are combinations of white pine and mixed hardwoods.

Area #1 is 20± acres of white pine and mixed oaks. The white pine has representation of all size classes and is all aged. The area is characterized by clumps of sawtimber sized trees generally of pine or mixed oak between which is found a pole sized hardwood stand with a white pine understory from seedling to small poles. The oak is mainly even aged 60-80 years. Hardwood seedling sprout reproduction is found in patches of from 1/4 - 1/2 acre occasionally.

Area #2 is 4±acres in size on a dry, steep slope. Species composition is pole size scarlet oak and red maple over a moderate understory of white pine and pitch pine.

Area #3 is 15± acres of flood plain occupied by mixed oaks, i.e.: black oak, red oak and white oak included with patches of pure red maple in the extremely wet portions. At the time of examination most of the area had standing water up to six inches deep. The understory is typical wetland brush species characterized by sweet pepperbush, azalea, and speckled alder.

Area #4 is approximately 25± acres in size. White pine is the predominate species. The area is characterized by occasional pockets of white oak and black oak, pole sized over an understory of white pine saplings. Pole size white pine and sawtimber occupy 80-90% of the area. Age of the stand is variable up to 80 years. Except for the pockets of hardwood poles the area is fully stocked to overstocked and in need of thinning.

Area #5 is a 3± acre mixed hardwood stand occupying a small drainage area. Predominant species are red oak, black oak and white oak, red maple and occasional hemlock. At some point in the past the area was ditched, presumably to drain enough water from the site to facilitate use of the area. As a result of this added drainage, the oak component became established and has developed into a good quality oak stand although modest in size.

Area #6 is 12± acres in size presently occupied by a slow growing mixed hardwood pole size stand overtopping an excellent sapling sized stand of white pine. Mortality of the hardwood stand was noted to be occuring throughout the area particularly in the larger diameter pole and small sawtimber size classes. Growth potential of the area for hardwoods is fair, however, potential for pine is good to excellent. A combination salvage cut and pine release operation yielding low quality small sawlogs and fuelwood is appropriate.

Area #7 is 12± acres in size. Presently, the site is occupied by a low-medium quality mixed oak sawtimber size stand with a dense understory of white pine saplings. A sawtimber harvest yielding from 3-5 mbft/acre of hardwood sawlogs should be undertaken in the near future. Potential for development of the white pine understory is excellent once the hardwoods are removed providing for future high yield harvests of white pine sawtimber as well as developing an area of high aesthetic quality adjacent to the Quinebaug River.

Area #8 is an 8± acre hardwood swamp. Forest stands are predominately red maple, however, there is a substantial white pine component included. The possibility exists to develop a white pine timber stand in this area, however, cultural activities are limited to opportunist situations i.e.: extremely dry conditions, or periods of extreme cold resulting in frozen conditions. Extreme windthrow potential exists mandating conservative cuttings to achieve the conversion.

Area #9 is 8± acres in size presently occupied by a two age hardwood pole size stand with a dense understory of white pine saplings. Past management appears to have involved either a diameter limit harvest of hardwood sawtimber applied to an even aged stand or a history of harvests which removed the biggest and best hardwoods and left the worst. Growth potential for hardwoods is good, for pine excellent. Careful thinning would result in a mixed hardwood/pine stand. Older, inferior quality hardwood stems should be removed providing adequate growing space for the younger, better formed hardwood stems and at the same time allowing for sufficient release of the white pine.

Area #10 is 18± acres in size occupied by a hardwood/pine stand. Growth potential for both oak and pine is good on this site. Management should consider maintenance of the mixed stand situation. Currently, stocking levels are extremely high indicating a need for thinning. A combination harvest of sawtimber and fuelwood aimed at upgrading the overall quality of the stand and providing adequate growing space for the residual stand should be accomplished in the near future.

Area #11 is a predominantly white pine sawtimber stand 10± acres in size. The southern portion of the area is a dense stand with little or no understory while the northern section is dominated by sawtimber size white pine with a hardwood/pine pole size stand as an understory component. A selective sawlog harvest should be considered in the near future.

Area #12 is 15± acres in size occupied by a stand of mixed species and size classes. The area was quite possibly used for livestock pasture until perhaps 25 years ago. The area has good potential for hardwoods and softwoods. Presently, red maple is the most common species found, however, adequate numbers of red oak and black oak in combination with white pine are present to constitute an adequately stocked mixed oak/pine stand. Most of the red maple component is of less than desirable form and should be removed to make room for the more desirable species.

As most of the property has a heavy white pine component of one size class or another, any management should take advantage of this for at least the next two rotations of trees on the property. Pure stands of white pine will occur as management progresses, however, potential for hardwood growth, particularly red oak and black oak is acceptable over a good portion of the property, therefore, better quality hardwood stems should be favored along with the pine as they occur.

WILDLIFE

Woodland wildlife habitat dominates the Davis property. It is of medium quality. Contributing factors include low diversity of land uses, of resultant vegetation and even aged woodlands. The drier areas consist of red oak and white oak with hickory and some pitch pine. Ash, elm, birch and red maple are found on the wetter areas. Understory vegetation is not heavy on the drier sites. It consists of azaleas, blueberry, witch hazel, arrowwood, sassafras, honeysuckle, mapleleaf viburnum , dogwood, Solomon's-seal, barberry and blue beech. Some seedlings and saplings derived from the overstory are also present, and serves as fall food for deer. In the wet areas spicebush and skunk cabbage were observed along with red maple and young birch sprouts.

Mast production was observed to be low, which may have been a direct result from the gypsy moth damage to the oaks. Squirrels, which rely heavily on the nut production, do not seem to be high in numbers. None were observed during the review.

Signs of white-tailed deer, rabbits and ruffed grouse were not observed. Browsing by rabbits or deer was not evident. However, these browsers could inhabit or frequent the area. The ruffed grouse at present are almost at the peak of their seven year population cycle, but no drumming by the males was heard. The cause of this may be the direct result of few drumming sites available in the area.

An occasional "den" tree was spotted and could provide shelter for songbirds, raccoon and skunk. Some songbirds were observed and evidence of skunk was present.

The upland soil series such as Paxton and Charlton have good potential for woodland wildlife habitat, as Agawam and Pootatuck. The droughty soils such as Merrimac, Hinckley and Windsor are only fairly suited for woodland wildlife habitat.

The wetlands on the property are of low value to wetland wildlife habitat. The key element of standing open water suitable for waterfowl, muskrats, beaver and the like is missing. The Quinebaug River adjacent to the property is unsuitable also because of the high velocity of the river flow. However, this type of habitat is well suited for river otter. Oxbow lakes, coves and adjacent open swamps often associated with river systems are not present. These types of wetlands make excellent habitat for waterfowl. There were few areas observed that could be made suitable for wetland wildlife.

No openland wildlife habitat exists on the Davis property. However, there is some potential to develop this type of habitat through land clearing if there is an interest to do so.

No fish habitat exists on the property except in the Quinebaug River. The river is regarded as a good trout river with excellent angling opportunities. It may be possible to establish a few small warm water fish ponds. These ponds would have to be excavated and may have fluctuating water tables due to the sandy nature of the subsoils present.

Timber stand improvement on the property would greatly improve the woodland habitat for management. Encouraging an uneven-aged timber stand and improving the mast producing trees would do much for wildlife. Also a few "den" trees per acre would increase shelter.

Establishing a recreational park on the property could enhance the wildlife value by creating diversity. This could easily be done by incorporating and following a wildlife habitat plan in with the recreational plan. The Soil Conservation Service would welcome the opportunity to help with the development of a management plan if the town of Brooklyn decides to purchase the property.

FISH RESOURCES

Acquisition of the Davis property would be a valuable asset to the town. If the property is acquired it would preserve over a mile of streambelt, (A streambelt is a natural environmental corridor). Some basic components of a streambelt are: the stream itself; adjacent land subject to stream overflow; associated wetlands; adjacent lands with special resources of public or environmental value (as scenic areas or wildlife habitat); future sites for nature trails.

The Quinebaug River is heavily stocked with trout. The area has an excellent combination of pools and rapids to hold trout. Due to a long range projected Shad, Sea Trout and Alewife and possibly Salmon Restoration Project for the Quinebaug River, it is important to protect as much of the stream as possible.

WATER SUPPLY

A water supply will have to be developed on site because there is no public water system in Brooklyn. This can be accomplished by the drilling of a well(s) to provide water for flush toilets and drinking purposes in areas of intense activity. The water supply would be considered a public supply and would therefore have to meet the requirements for a public such as stated in the Connecticut Public Health Code.

Much of the property appears to be suitable for passive recreation such as picnicking, hiking, bird watching and fishing. Boating and canoeing will also be possible with the development of a boat launching area. Boating may be affected by seasonal high and low water levels in the river. Swimming and bathing in a watercourse wuch as a river is not recommended because of strong and changing currents shifting to the river bottom, leaving abrupt dropoffs and exposing large rocks.

WASTE DISPOSAL

At least one water flush toilet building would have to be provided in a central location to best accommodate the greatest number of people. Because this area is not served by public sanitary sewers the toilet building would

be provided with onsite waste disposal.

The large level areas northwest of the old dam would be a logical site for the development of a number of recreational areas such as the ballfields, tennis courts, picnic areas and toilet building.

The soils in this area appear to be suitable for the installation of a subsurface sewage disposal system. The soils may in fact be rapidly permeable, causing concern for potential groundwater degradation in the immediate vicinity. Maintaining appropriate separating distances will be necessary. The system should not be installed without proper soil testing and an engineered design plan.

Electrical and telephone lines will also have to be installed. These should be installed underground for aesthetic reasons. Electricity will be needed to power the well pump and lighting for the toilet building. A public telephone is necessary at a recreational area in case of emergency.

PLANNING CONCERNS

The Town of Brooklyn currently owns very little public recreation land, with the Brooklyn school serving as the chief facility for recreation. The town also owns a small park in East Brooklyn and a little league field located on the town garage property in East Brooklyn. The State of Connecticut owns 240 acres in the Natchaug State Forest, located in the western part of town; and a 75-acre parcel of land owned by the Windham Area Soil and Water Conservation District is semi-public. This latter facility is being developed as a conservation showcase.

Brooklyn's Plan of Development indicates that one large multi-purpose park of 50± acres would be desirable for the town. It also specifies that natural areas for conservation-open space should be aquired. The Recreation and Open Space Plan for the town specifically pinpoints the Davis property location as an ideal site for a 5-acre active recreation site and also as a site which should be obtained because it is in a floodplain area. The plan recommends leaving the majority of the site in a natural state. Thus the desired recreational use of the site is very much in keeping with the Plan of Development Recommendations.

The Davis property is located over a major aquifer, and most of the site is in a primary recharge area. Thus, the land use on this site can have a dramatic effect on the quality of the groundwater. As this aquifer has the potential to be a major drinking water source in the future, careful use of the land above it would be prudent. Recreational usage is an excellent means of ensuring minimal groundwater contamination. Such usage would also be acceptable in a flood plain area.

The Quinebaug River at that location is classified as B by the State Department of Environmental Protection. This classification means that the water quality of the river renders it suitable for bathing and other recreational purposes. It also signifies that the water has good aesthetic value and is an excellent fish and wildlife habitat. The nearest U.S. Geological Survey

gaging station, at which bacterial water quality is tested, is located at Jewett City. Water quality testing there reveals coliform counts which are within or slightly above suggested EPA guidelines.

The site is currently zoned rural residential and industrial. The recreational use proposed for this site is in conformance with the zoning regulations.

A primary consideration for the purchase of the site is the aquisition of a right-of-way, as the property is useless at the present time. The most feasible right-of-way would be the privately-owned dirt road which connects the site to South Street.

RECREATION POTENTIAL

The town of Brooklyn is considering purchase of the 124± acre Davis property along the Quinebaug River for use as a town recreation area. The tract is irregular in shape and is long and narrow with more than one mile of river frontage comprising its eastern boundary. Water frontage is of primary importance in providing for recreational use. Even where water quality precludes swimming, the boating and sport fishing potential are much sought after.

The existing access point to the property is via a right-of-way (R.O.W.) located near the east end of the tract and connecting it with South Street over adjacent private land. Since the property does not front on South Street, the only access is through this R.O.W. Ensuring the continued availability of this R.O.W. should be a crucial consideration to purchase since it is the only vehicle access to the property. If no written agreement exists to provide for this R.O.W., one should be established to guarantee continued use.

The site has considerable passive recreational potential. There is an existing dirt road which runs almost the entire length of the property and which is being informally used at present. This road roughly parallels the river. Some motorcycle "trail riding" has been occuring as shown by the tire marks in evidence on the site.

The woodland understory is, for the most part, relatively open and could be readily used for a range of activities including picnicking, tent camping, and trail establishment. With forest clearing, the option exists for open field types of activity. Ballfields, tennis courts, and ice skating rinks could be established on the level portions of the tract.

If purchased, research on the history of the area would be advisable to determine if the property had any previous significance. River uses such as power production, etc. and other relevant information so gathered could be utilized in setting up an educational program detailing the past significance of this area. This research should be done prior to any alteration of the

tract (e.g. - earthmoving, etc.) Any significant man-made features encountered, such as those tying into a former mill site, should be preserved so that they can be used to illustrate the mechanics of the mill's operation.

Both banks of the river along the tract are undeveloped and provide a high quality "natural" setting. Passive recreational pursuits would blend nicely with greenbelt preservation on the Davis property. The remnant of a dam offers a minor obstacle to canoeists but should not pose a particular problem to canoeists of moderate proficiency. There are also some slight rapids.

A boat launch area installed on the Davis tract would provide boaters access to a scenic and moderately challenging stretch of the Quinebaug River. Locating the launch ramp on the upstream end of the tract would minimize the travel distance necessary to gain access to the ramp from South Street. It would also maximize the distance of travel with the river current along the property. Any flood plain development should, initially, probably be limited to the establishment of a boat launch ramp. If the current is not very erosive in the location selected, a packed, processed gravel boat ramp installed during low water conditions, should give adequate service.

The property is sufficiently large and has an adequate road network to provide fairly good opportunities for forestry management on at least the more level portions. Selective cutting for either fuel wood or saw logs (as determined by a forester) can be tied into the establishment of specific recreation facilities (e.g. - ballfields). A good blend of proper timber resource management and recreation facility layout will usually complement one another and often result in a more usable site with enhanced potential for accommodating additional activities.

There are good opportunities for the development of additional trails on the tract although the existing network seems adequate for the informal use occurring and near term use envisioned. Establishment of formalized, active recreation facilities may necessitate modification and/or expansion of the existing trails. Some trail related activities possible are: bird watching/nature studies, jogging, cross-country skiing, snowshoeing, and fisherman access.

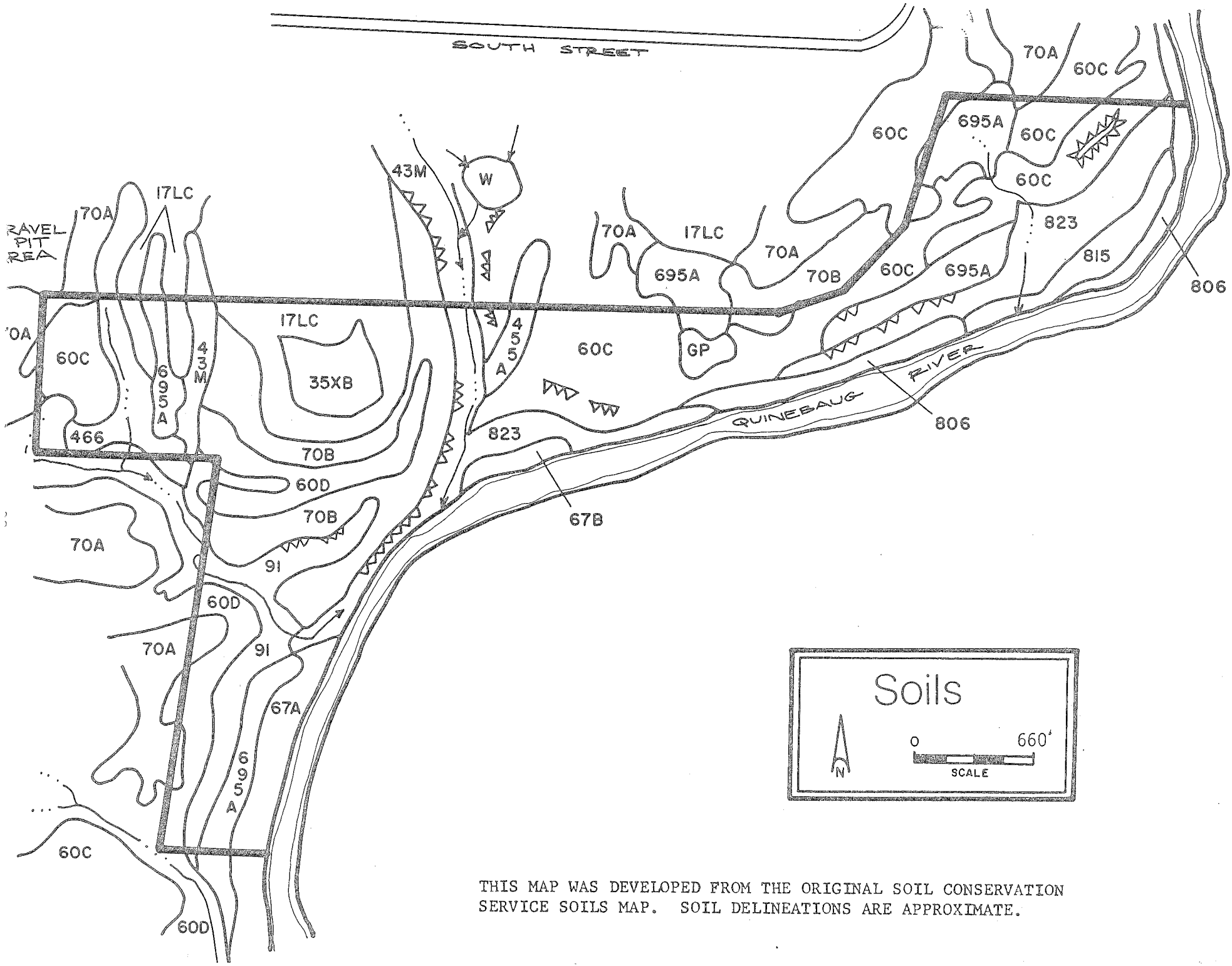
Soils limitations would probably preclude economical development of the central portion (long axis) of the tract for active recreation. As previously mentioned, development of active recreational facilities would be more practical in the northeast (upstream) portion near the access point from South Street. This would minimize road construction and road maintenance necessary by establishing active recreation facilities and associated parking near that point of entry. Activities such as picnicking, boating, tennis, horse shoe toss, volleyball, etc. could be accommodated in this area. The remaining (downstream) portion of the tract would thereby remain effectively available for the more passive recreational pursuits. Vehicular exclusion, by gating, while not essential, may serve to enhance the passive recreation potential of this area. The active use zone could be clearly distinguished from the passive use zone. A service and emergency vehicle path should be maintained for most of the tract, even if portions are gated off, so that logging operations, fire truck and ambulance access are still made possible.

Some passive recreational activities that the central and western portions could offer are: hiking, jogging, and bird watching.

Any large, town owned tract, offers educational opportunities in natural sciences, to those schools in its system. If forestry management is undertaken and the area does have any historical significance, these could be exploited for their educational potential.

Acquisition by the town is seen as offering immediate passive recreation opportunities and the option for additional recreation development to meet the town's future needs.

Appendix



THIS MAP WAS DEVELOPED FROM THE ORIGINAL SOIL CONSERVATION SERVICE SOILS MAP. SOIL DELINEATIONS ARE APPROXIMATE.

DAVIS PROPERTY

BROOKLYN, CONNECTICUT

PRINCIPLE LIMITATIONS AND RATINGS OF SOILS FOR FOLLOWING USES:

	RECREATION			DEVELOPMENT			
Soil Symbol and Series	Picnic Areas	Play-grounds	Paths & Trails	Dwellings with Basements	Shallow Excavations	Gravel	Drainage
17LC Charlton	Moderate, slope, lg. stones	Severe, slope, lg. stones	Slight	Moderate, slope	Moderate,slope	Improbable: excess humus	Deep to water
Hollis	Severe, depth to rock	Severe,slope, depth to rock, lg. stones	Slight	Severe,depth to rock	Severe,depth to rock	Improbable: excess humus	Deep to water
35XB Paxton	Moderate, lg. stones, pers.slowly	Severe, lg. stones	Slight	Moderate, wetness	Moderate,wet-ness, dense layer	Improbable: excess humus	Deep to water
##60C Hinckley	Severe, sm. stones	Severe, sm. stones,slope	Slight	Moderate, slope, lg. stones	Severe, cut-banks cave	Probable	Deep to water
60D Hinckley	Severe, sm. stones,slope	Severe,sm. stones,slope	Moderate, slope	Severe,slope	Severe,cut-banks cave, slope	Probable	Deep to water
#67A Windsor	Slight	Slight	Slight	Slight	Severe,cut-banks cave	Improbable: excess Humus	Deep to water
#67B Windsor	Slight	Moderate, slope	Slight	Slight	Severe, cut-banks cave	Improbable; excess humus	Deep to water

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BROOKLYN, CONNECTICUT

PRINCIPLE LIMITATIONS AND RATINGS OF SOILS FOR FOLLOWING USES:

	RECREATION			DEVELOPMENT		
Soil Symbol and Series	Picnic Areas	Play-grounds	Paths & Trails	Dwellings with Basements	Shallow Excavations	Gravel	Drainage
#70A Merrimac	Slight	Moderate, sm.stones	Slight	Slight	Severe, cutbanks cave	Probable	Deep to water
#70B Merrimac	Slight	Moderate, slope	Slight	Slight	Severe,cutbanks cave	Probable	Deep to water
#455A Sudbury	Moderate, wetness	Moderate, wetness, sm.stones	Moderate, wetness	Severe, wetness	Severe,wetness, cutbanks cave	Probable	Cutbanks cave
#695A Agawam	Slight	Slight	Slight	Slight	Severe,cutbanks cave	Probable	Deep to water
WETLAND SOILS							
*43M Ridgebury	Severe,lg. stones,wet-ness,percs. slowly	Severe,wet-ness, lg. stones,percs. slowly	Severe,wet-ness	Severe, wetness	Severe,wetness	Improbable: excess humus	Percs.slow frost acti
Leicester	Severe,lg. stones, wetness	Severe,wet-ness, lg. stones	Severe, wetness	Severe, wetness	Severe, wetness	Improbable: excess humus	Frost action
Whitman	Severe,lg. stones, ponding	Severe, ponding lg.stones	Severe, ponding	Severe, ponding	Severe,ponding	Improbable: excess humus	Percs.slowl frost acti

DAVIS PROPERTY

BROOKLYN, CONNECTICUT

PRINCIPLE LIMITATIONS AND RATINGS OF SOILS FOR FOLLOWING USES:

	RECREATION			DEVELOPMENT			
Soil Symbol and Series	Picnic Areas	Play-grounds	Paths & Trails	Dwellings with Basements	Shallow Excavations	Gravel	Drainage
*91 Adrian	Severe, ponding, excess humus	Severe, ponding, excess humus	Severe, ponding, excess humus	Severe, ponding	Severe,ponding, cutbanks cave, excess humus	Improbable: too sandy	Ponding, frost action, subsides
##* Walpole 466	Severe, wetness	Severe, wetness	Severe, wetness	Severe, wetness	Severe,wetness, cutbanks cave	Probable	Frost action, cutbanks cave
#*806 Occum	Moderate, flooding	Severe, flooding	Moderate, flooding	Severe, flooding	Severe,cutbanks cave	Improbable: excess humus	Deep to water
#*815 Pootatuck	Moderate, flooding, wetness	Severe, flooding	Moderate, wetness, flooding	Severe, Flooding, wetness	Severe,cutbanks cave, wetness	Improbable: too sandy	Flooding, cutbanks cave
*823 Saco	Severe,wet-ness,excess humus	Severe, flooding, wetness, excess humus	Severe,wet-ness, excess humua	Severe, flooding, wetness	Severe,wetness, cutbanks cave	Improbable: too sandy	Flooding, frost action, cutbanks cave
*825 Rippowam	Severe, wetness	Severe,wet-ness,flood-ing	Severe, wetness	Severe, flooding, wetness	Severe,wetness, cutbanks cave	Improbable: too sandy	Flooding, cutbanks cave, frost action

\# Prime Farmland
Additional Farmland of Statewide Importance
* Designated wetland soil by P.A. 155

SOIL INTERPRETATIONS FOR URBAN USES

The ratings of the soils for elements of community and recreational development uses consist of three degrees of "limitations:" slight or no limitations; moderate limitations; and severe limitations. In the interpretive scheme various physical properties are weighed before judging their relative severity of limitations.

The user is cautioned that the suitability ratings, degree of limitations and other interpretations are based on the typical soil in each mapping unit. At any given point the actual conditions may differ from the information presented here because of the inclusion of other soils which were impractical to map separately at the scale of mapping used. On-site investigations are suggested where the proposed soil use involves heavy loads, deep excavations, or high cost. Limitations, even though severe, do not always preclude the use of land for development. If economics permit greater expenditures for land development and the intended land use is consistent with the objectives of local or regional development, many soils and sites with difficult problems can be used.

Slight Limitations

Areas rated as slight have relatively few limitations in terms of soil suitability for a particular use. The degree of suitability is such that a minimum of time or cost would be needed to overcome relatively minor soil limitations.

Moderate Limitations

In areas rated moderate, it is relatively more difficult and more costly to correct the natural limitations of the soil for certain uses than for soils rated as having slight limitations.

Severe Limitations

Areas designated as having severe limitations would require more extensive and more costly measures than soils rated with moderate limitations in order to overcome natural soil limitations. The soil may have more than one limiting characteristic causing it to be rated severe.

About the Team

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

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

PURPOSE OF THE TEAM

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

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

REQUESTING A REVIEW

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

For additional information regarding the Environmental Review Team, please contact Jeanne Shelburn (889-2324), Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, 139 Boswell Avenue, Norwich, Connecticut 06360.