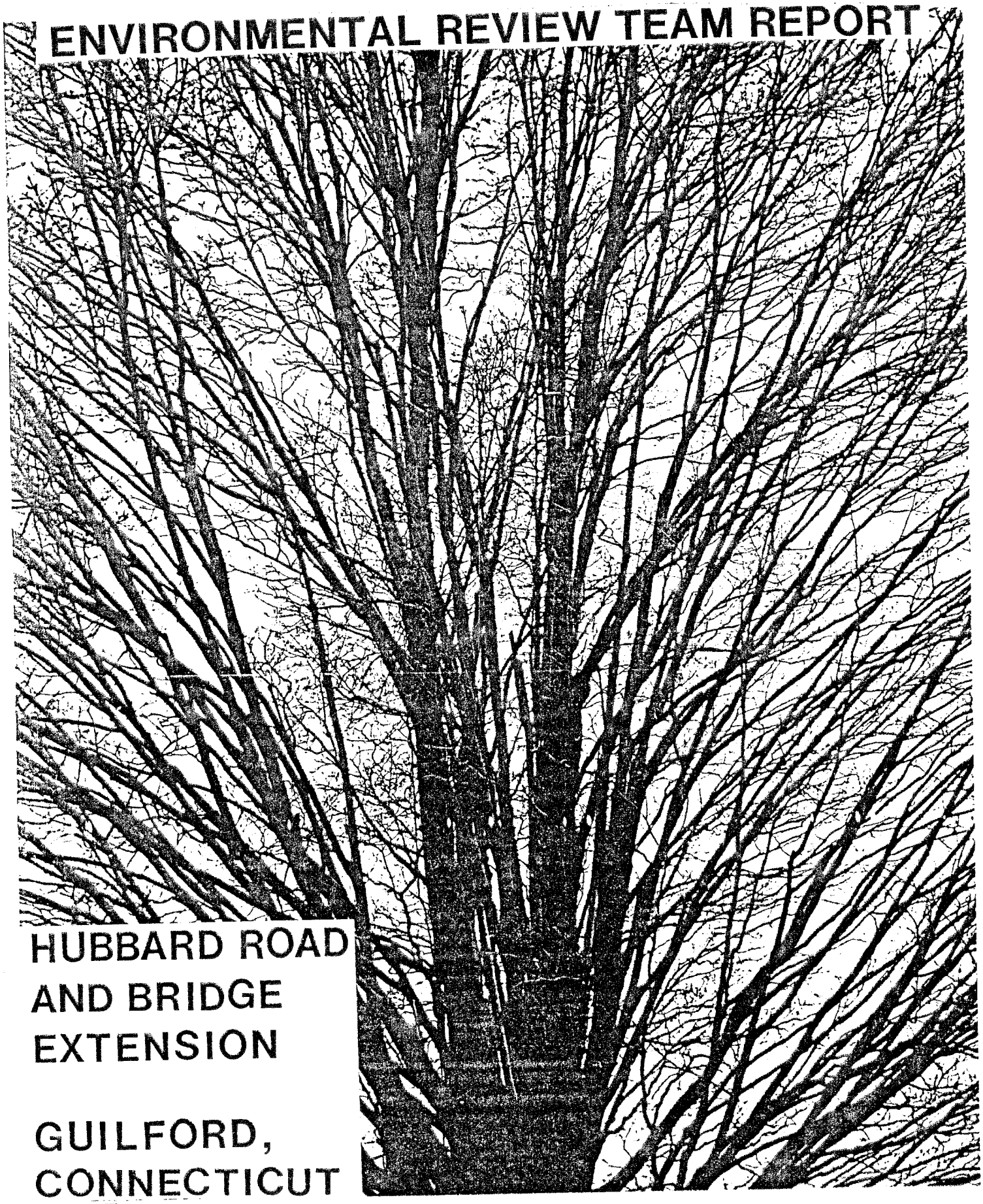
ENVIRONMENTAL REVIEW TEAM REPORT



HUBBARD ROAD AND BRIDGE EXTENSION

GUILFORD, CONNECTICUT

KING'S MARK RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

HUBBARD ROAD AND BRIDGE EXTENSION ENVIRONMENTAL REVIEW

Guilford, Connecticut

Prepared by the King's Mark Environmental Review Team
of the King's Mark Resource Conservation
and Development Area, Inc.

Wallingford, Connecticut

for the

Guilford Inland Wetlands Commission

APRIL 1986

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EXECUTIVE SUMMARY

This Environmental Review Team Report was the result of the requests from the Guilford Inland Wetlands and Conservation Commissions. The King's Mark Environmental Review Team (ERT) was requested to inventory and assess the natural resource characteristics of a portion of the West River and its associated wetlands. The Town of Guilford is proposing to upgrade and extend Hubbard Road over the West River. In order to accomplish this, it will be necessary to build 515 feet of new road and a pre-stress bridge. Approximately 4,540 cubic yards of fill will also be required. Both Commissions were thus primarily concerned with the potential adverse environmental affects of the proposed crossing on the West River and surrounding natural areas.

The study area is located just north of the Connecticut Turnpike (I-95), between Hubbard Road and Route 77 via Saw Mill Road. The site is approximately 25 acres in size, consisting primarily of open woodland, upland, riverbank, and wetland communities. The town's major aquifer also occupies the site.

The review process consisted of four phases: (1) inventory of the study site's natural resources (collection of data); (2) assessment of these resources (analysis of data); (3) identification of natural resource capabilities; and (4) presentation of planning and development guidelines.

Through the inventory and assessment process, specific resources, areas of concern, and development limitations and opportunities were

defined. They fall into the following categories: (1) physical characteristics; (2) biological attributes; and (3) planning considerations.

Physical Characteristics

Connecticut Department of Transportation data indicates that bedrock is encountered at a depth of 12 feet at a boring site approximately 2,000 feet south of the proposed bridge crossing. Connecticut Water Resources Bulletin #31 (Lower Connecticut River Basin) suggests that depth to bedrock in the study area ranges between 10 feet and 39 feet. Based on the above information, it seems likely that the bedrock surface is probably deeper beneath the West River. Soil borings would be needed in this area in order to get an accurate profile of the bedrock surface. This information would be extremely important to the town engineer, particularly for establishing a stable foundation for locating bridge footings.

Based on the present plans for the proposed project, the construction of the road and bridge will require 4,540 cubic yards of fill material. It appears that much of the fill material will need to be placed over alluvial soils. Filling and construction on the flood plain soils, like inland wetland soils, can have adverse environmental impacts because of the important hydrologic and ecologic roles they play.

Based on the site plan, most of the wetland filling will need to take place on the east side of the river. Every effort should be made to reduce the impacts of the proposed construction on the flood plain through careful and judicious planning. Wetland areas disturbed by the proposed project should be reestablished in it's former state.

Alluvial soils on the east side study area may contain some layers that have organic materials in them. Organic materials have no structural bearing capacities for the proposed road and bridge footings. Therefore, the Town should strongly consider the placement of soil borings along the proposed route, which will provide the town engineer a good profile of subsurface conditions.

If the project is properly engineered, and final plans closely followed, it seems likely that construction of the road and bridge could be done without significant change to the local water table and surface drainage. The potential for changes in terms of surface drainage and groundwater would be expected to be greatest during the actual construction periods.

Runoff from the road is likely to be contaminated with de-icing compounds. Some of these contaminants finding their way into the wetlands or flood plains paralleling the West River may be purified or removed to some degree. It is unlikely that they could completely remove them all. If these contaminants find their way directly into the River, without any wetland renovation, they represent threat to water quality.

Winter salt and sand may be carried directly to the stream by the storm drainage system if curbing is used. Without curbing, roadway drainage will sheet flow to the edge of road where most of the sand will be deposited.

In order to minimize the potential for deterioration of water quality of the West River from the proposed project, the installation of a sediment retention basin(s) during excavation and construction should be considered. They would reduce downstream siltation, and need to be maintained on a regular basis to provide continued effectiveness.

It seems likely that the proposed project should not adversely effect the Guilford Well provided that: (1) the project is carefully planned, with all construction activity closely supervised and monitored; (2) road salting is minimized; and (3) a detailed erosion and sediment control plan is closely followed.

Construction impacts within the West River proper can be minimized by either silt curtains, cofferdams, or proper de-watering techniques. If there is a need to de-water the excavations for bridge footings, it should be determined if there will be any mutual interference with the Guilford Well during pumping periods.

Rippowam and Pootatuck soils are flooded by the West River during large storm events. The proposed filling of this wetland area will limit the natural storm water retention function of this area. This in turn may aggravate any existing downstream flooding problems.

The shallow water table of the Rippowam soil creates good wetland wildlife habitat. The loss of this area due to filling the site should not be of great significance since much more of this habitat is located along the River.

Biological Attributes

The West River is presently classified as a Class A stream. A Class A stream is defined as a surface water which may be suitable for drinking water supply and/or bathing; suitable for all other water uses; character uniformly excellent, and may be subject to absolute restriction on the discharge of pollutants.

The study area may be divided into six vegetative types. These include: (1) mixed hardwoods; (2) old fields; (3) flood plain wetland; (4) hardwood swamp; (5) open fields; and (6) plantation. No

rare or endangered plant or animal species have been reported as being located or observed within the study area.

Impact of the proposed road and bridge extension on vegetation should be minimal. The vegetative types that will be disturbed (i.e., flood plain wetland and old field) do not support any large quality trees. However, changes in drainage patterns caused by the road and bridge extension may have an effect on plant and animal species composition. If long term soil moisture is altered (i.e., from moist to dry conditions), plant species composition and diversity will change with a new soil moisture regime.

The West River is one of the most valuable trout streams in New Haven County. However, a number a measures can be implemented to minimize the impact on the fishery resource. They are: (1) do not alter the stream bottom in any way; the bridge should completely span the River; (2) implement proper erosion and sediment control measures to protect downstream areas from siltation; (3) limit tree cutting as much as possible within 50 feet of the River's edge; the trees help to stabilize the River's banks, and provide shade to help cool stream water during summer months; (4) minimize work near the river between April 15th and May 15th to limit the impact on the trout fishermen.

The on-site wetlands are typified by the following features: (1) well drained, altered wooded riverbank wetland type on the western side of the West River; (2) the West River proper; (3) the moderately well drained, nearly level wooded flood plain on the eastern bank of the West River; (4) the poorly drained, scrub-shrub swamp adjacent to Saw Mill Road.

The wetlands on the site perform the following functions: (1) form natural floodways that convey floodwaters from upstream to downstream points; (2) reduces and slowly releases flood waters to the downstream areas, thereby restricting flood peaks; (3) maintains water quality; and (4) provides wildlife habitat.

There will be short term or long term impacts on wetlands from the proposed road and bridge extension. Short term effects will most likely be limited to disturbance to the stream bed during installation of the culvert/bridge structure as a result of siltation. Long term impacts will be as a result of the loss of habitat from roadway fills, and the change in stream bed characteristics at the bridg crossing of the West River due to construction activities. Additionally, there will be a degree of loss of isolation from man and vehicle noise by the introduction of the road and bridge.

Planning Considerations

The bridge and road extension is designed to alleviate traffic congestion in the following areas: (1) at the intersection of Long Hill Road and Route 1; (2) along the stretch of Route 1 which is

commercially developed; and (3) at the intersection of Route 1 and Saw Mill Road. This is not to be construed that traffic congestion will cease, but peak hour traffic will be diminished.

The Guilford Master Plan and Zoning Map permit the proposed bridge and road extension. In fact, it encourages the construction of an east-west artery in this general location.

The riverbank, surrounding undeveloped uplands, and inland wetlands are used for passive recreational activities such as hiking and fishing. This is unimproved land, and the on-site trails are maintained by the people using them.

The proposed bridge would be a potential site for fishing if a small access area were incorporated into the bridge and road design. The construction and maintenance of hiking trails should also be encouraged in the design plans.

Although there are other places within Guilford where one may enjoy outdoor passive recreation, the careful development of this area into a hiking, fishing, or birdwatching area would benefit the entire community.

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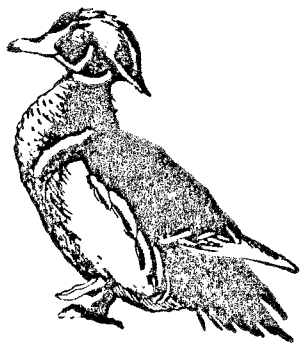


INTRODUCTION

Introduction

The Guilford Inland Wetlands Commission, with support from the Guilford Conservation Commission requested an environmental review on the West River and its associated wetlands. The study area is located just north of the Connecticut Turnpike (I-95), between Hubbard Road and Route 77 via Saw Mill Road (Figure 1). The site is approximately 25 acres in size, consisting primarily of open woodland, upland, riverbank, and wetland communities. The town's major aquifer also underlies the site.

The Town of Guilford is proposing to upgrade and extend Hubbard Road over the West River and its associated wetlands. To accomplish this, it will be necessary to construct 515 feet of new road and a pre-stress bridge. Approximately 4,540 cubic yards of fill will also be required. This east-west roadway is designed to connect two north-south arterial roads: Long Hill Road and Route 77, via Saw Mill Road (Figure 2). The new road and bridge will provide an east-west access route north of the Connecticut Turnpike as well as allowing access to a proposed municipal complex which will be situated on the north side of Hubbard Road between Long Hill and the West River. The Environmental Review Team (ERT) was concerned primarily with the potential adverse environmental impacts of the proposed bridge and road construction on the West River and adjacent natural communities.

Objectives of the ERT Study

The primary goal of this environmental review was to

inventory and assess the natural resource characteristics of the site and determine the potential adverse environmental effects, if any, of the proposed extension of Hubbard Road and construction of a bridge over the West River and its associated wetlands. Objectives of this ERT study included: (1) to determine the potential effect the proposed bridge and road extension will have on flooding in the immediate area; (2) to assess the geohydrology of the study site; (3) to review storm water drainage, and existing water quality and supply of the study site; (4) to inventory and assess wetland flora/fauna, and recreational opportunities of the study site; (5) to assess the erosion and sedimentation characteristics of the study site; and (6) to review and analyze current traffic flow and access in the study area.

The ERT Process

Through the efforts of the Guilford Inland Wetlands and Conservation Commissions, Town Engineering and Planning Departments, and the King's Mark Environmental Review Team, this environmental review was conducted for the Town. This review is not intended to compete with town design plans for this site. Rather, it provides a natural resource data base allowing the Town to make informed decisions concerning the use of the proposed site.

The review process consisted of four phases: (1) inventory of the study sites's natural resources (collection of data);
(2) assessment of these resources (analysis of data);
(3) identification of natural resource capabilites; and
(4) presentation of planning and development guidelines.

Figure 1

LOCATION OF STUDY SITE

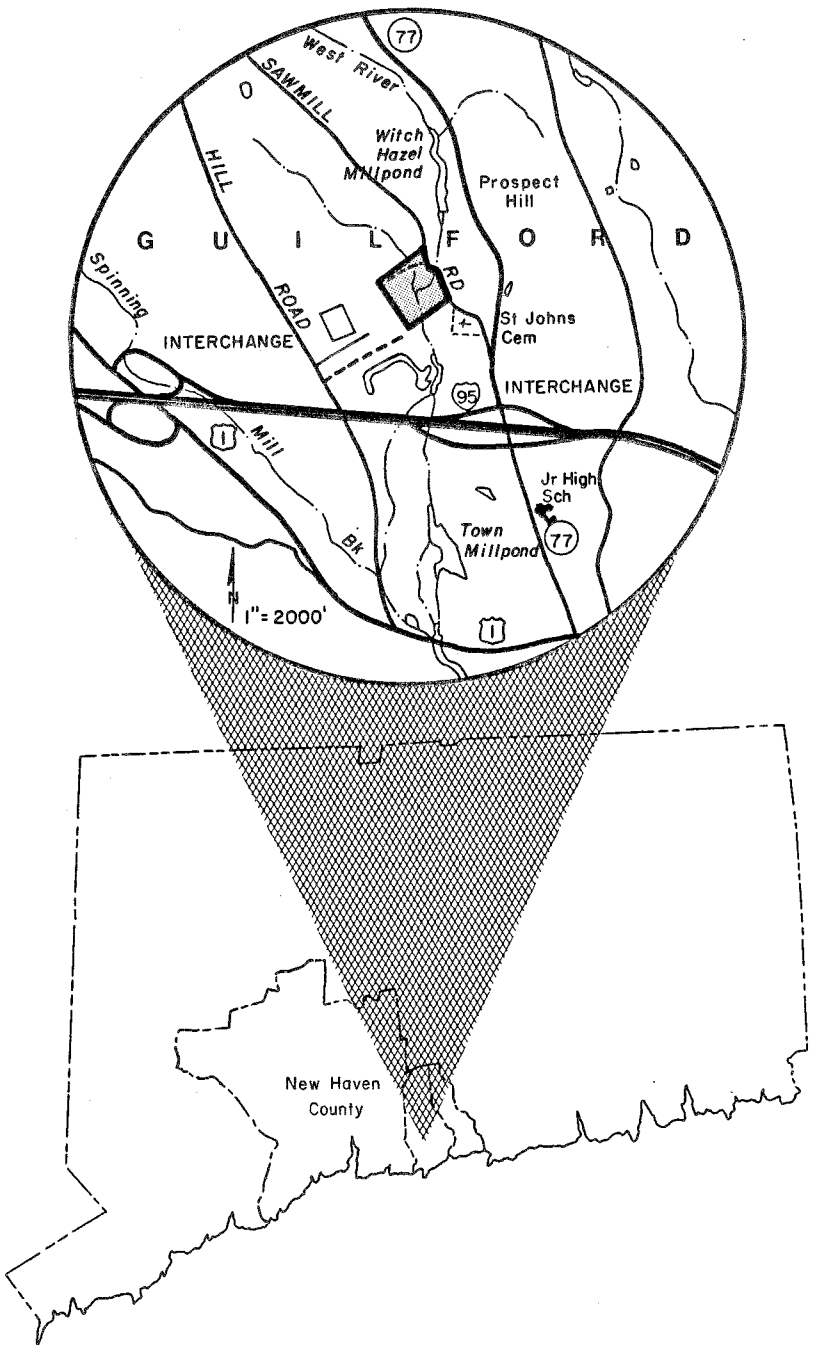
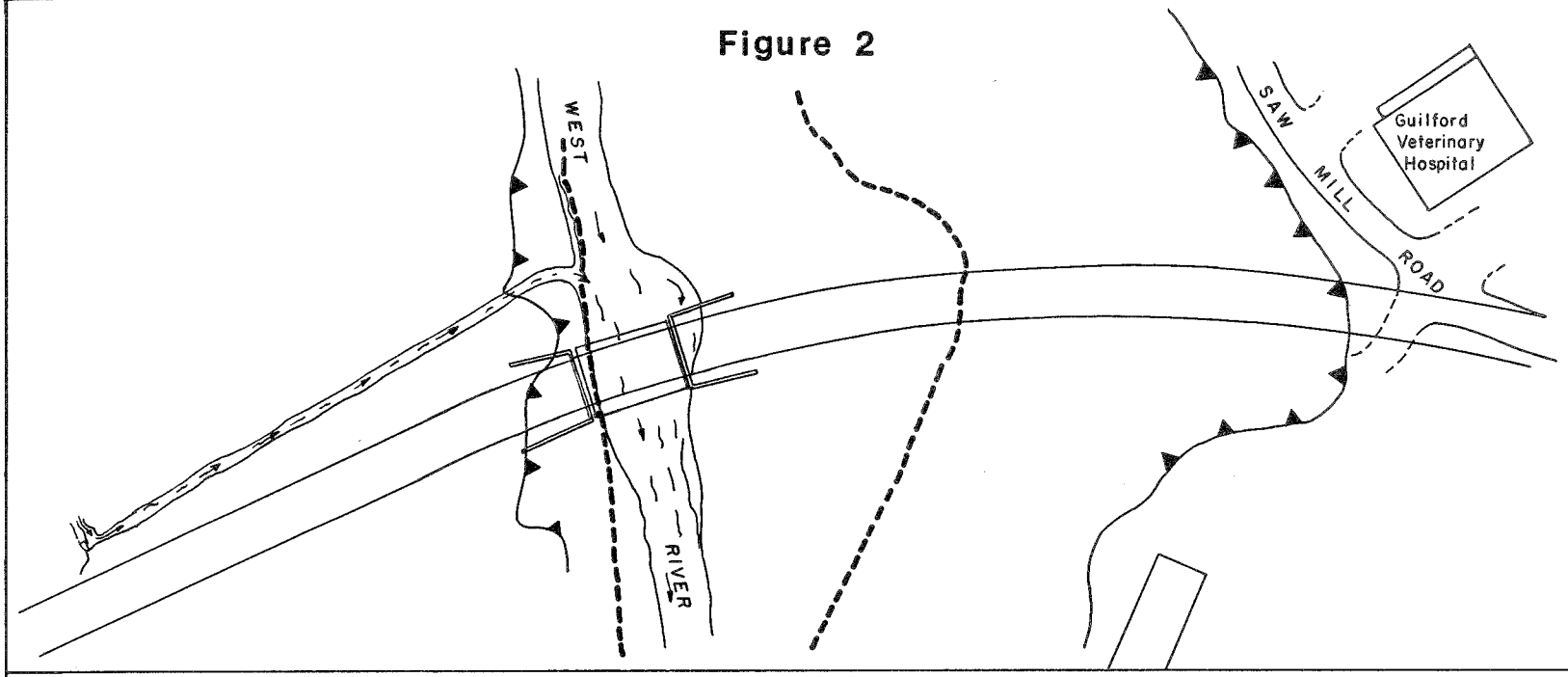


Figure 2



PROPOSED ROAD

PROPOSED BRIDGE

BROOK (showing direction of flow)

WETLAND BOUNDARY

100 YEAR FLOOD LINE

SOURCE: Town of Guilford, Engineering Department (1985)

HUBBARD BRIDGE AND ROAD EXTENSION

GUILFORD, CONNECTICUT

PROPOSED BRIDGE AND ROAD LAYOUT

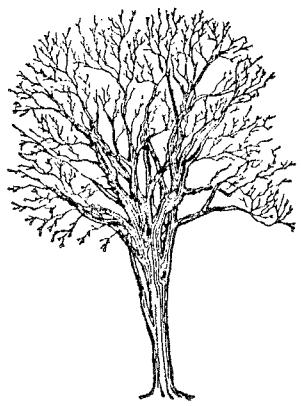
King's Mark Environmental Review Team

0 100'

The data collection phase involved both literature and field research. Mapped data, technical reports or town plans were perused, and specific information concerning the site was collected. Field review and inspection of the site proved to be a valuable component of this phase. The emphasis of the field review was on the exchange of ideas, concerns, and alternatives. Being on site also allowed Team members to check and confirm mapped information, and identify other resources.

Once the Team members had assimilated an adequate data base, it was then necessary to analyze and interpret their findings. The results of this analysis enabled the Team members to arrive at an informed assessment of the site's natural resource development opportunities and limitations.

PHYSICAL CHARACTERISTICS



PHYSICAL CHARACTERISTICS

Topography and Setting

Land surface in the study area is characterized by relatively flat to gentle slopes. These slopes are controlled mainly by the unconsolidated materials (i.e., sand, gravel, and flood plain soils) overlying the bedrock. Maximum and minimum elevations in the study area are about 80 feet and 20 feet above mean sea level, respectively (Figure 3).

Geology

The proposed project is located in an area that is encompassed by the Guilford topographic quadrangle. There is no bedrock geologic map published to date for the quadrangle. However, there is preliminary bedrock geologic information for the quadrangle on file at the DEP's Natural Resources Center in Hartford. This information, compiled by Stanley Bernold of Yale University is available for review purposes only. A surficial geologic map (QR-28, by Richard Foster Flint) has been published for the quadrangle by the Connecticut Geological and Natural History Survey.

Bedrock Geology

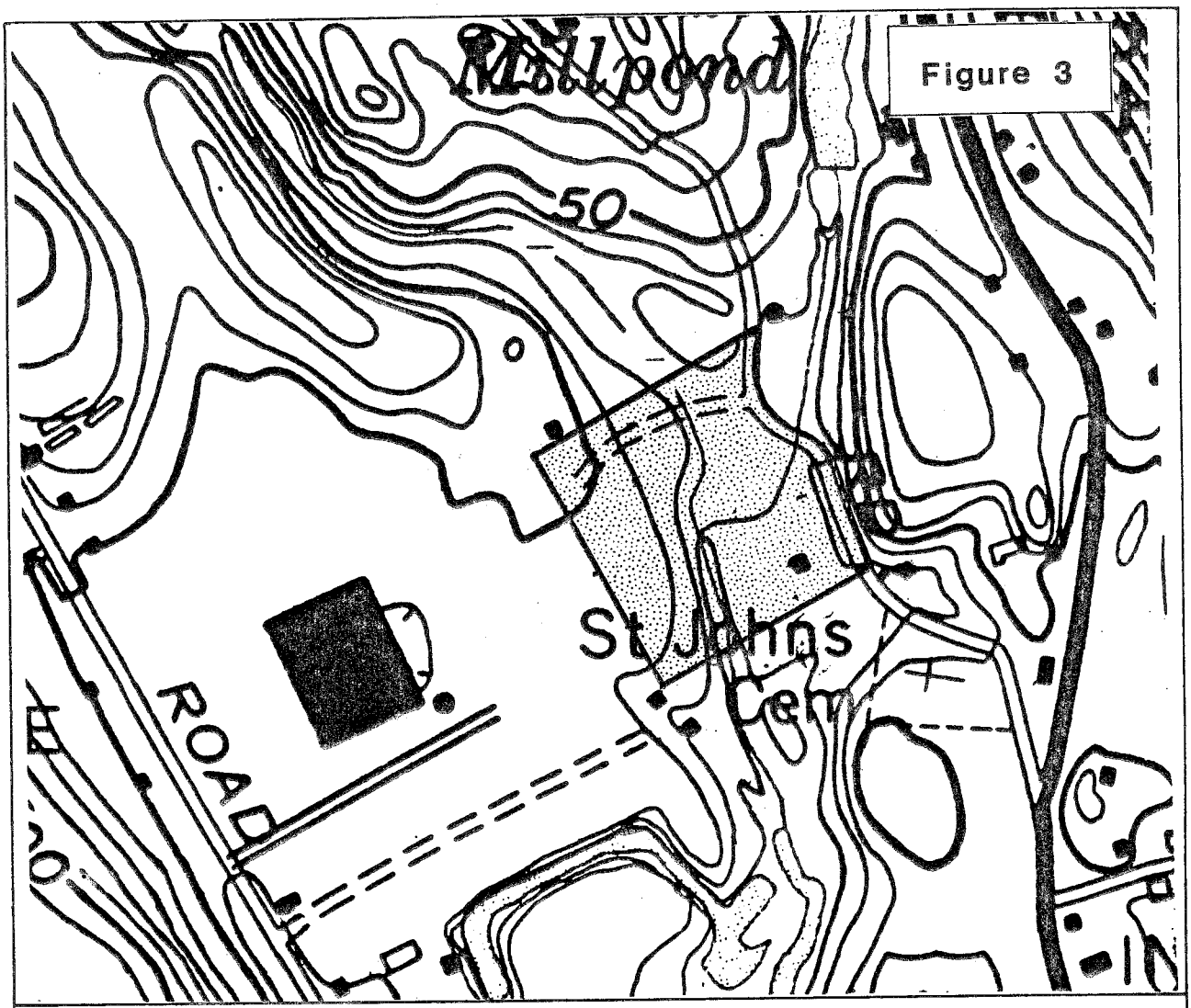
There are few isolated areas visible along the west bank of the West River where rock breaks the ground surface (Figure 4). It was not possible on the review day to determine whether or not these rock exposures are actual bedrock outcroppings or large boulders,

which have been partially uncovered due to streambank erosion.

In addition to Bernold's unpublished bedrock geologic map, the following subsurface data was also compiled and reviewed for the purpose of this project: (1) the well completion report for a drilled well servicing the Guilford Veterinary Hospital about 500 feet east of the proposed road and bridge crossing; (2) the logs of four borings drilled for the Connecticut Department of Transportation (DOT) along the Connecticut Turnpike south of the study area; (3) the logs of borings drilled between the AM Bruning facility and the West River (west of the study area) as part of a hydrogeological investigation; and (4) hydrogeologic information in Water Resources Bulletin #31 (Lower Connecticut River Basin.)

Bedrock was encountered at about 14 feet on the Guilford Veterinary Hospital property. The DOT data indicates that bedrock was encountered at a depth of 12 feet at a boring site more or less 2,000 feet south of the proposed bridge crossing. Connecticut Water Resources Bulletin #31 (Lower Connecticut River Basin) suggests that depth to bedrock in the study area ranges between 10 feet and 39 feet. Subsurface data reviewed from the AM Bruning study suggests that the bedrock surface is at least 21.5 feet deep about 550 feet west of the proposed bridge site. However, borings drilled about 500 to 650 feet northwest of the proposed bridge site encountered bedrock at relatively shallow depths (i.e., 5 feet and 13.5 feet).

Based on this information, it seems likely that the bedrock surface is probably deeper beneath the West River, and that the rock exposures along the west side are probably partially uncovered



STUDY AREA

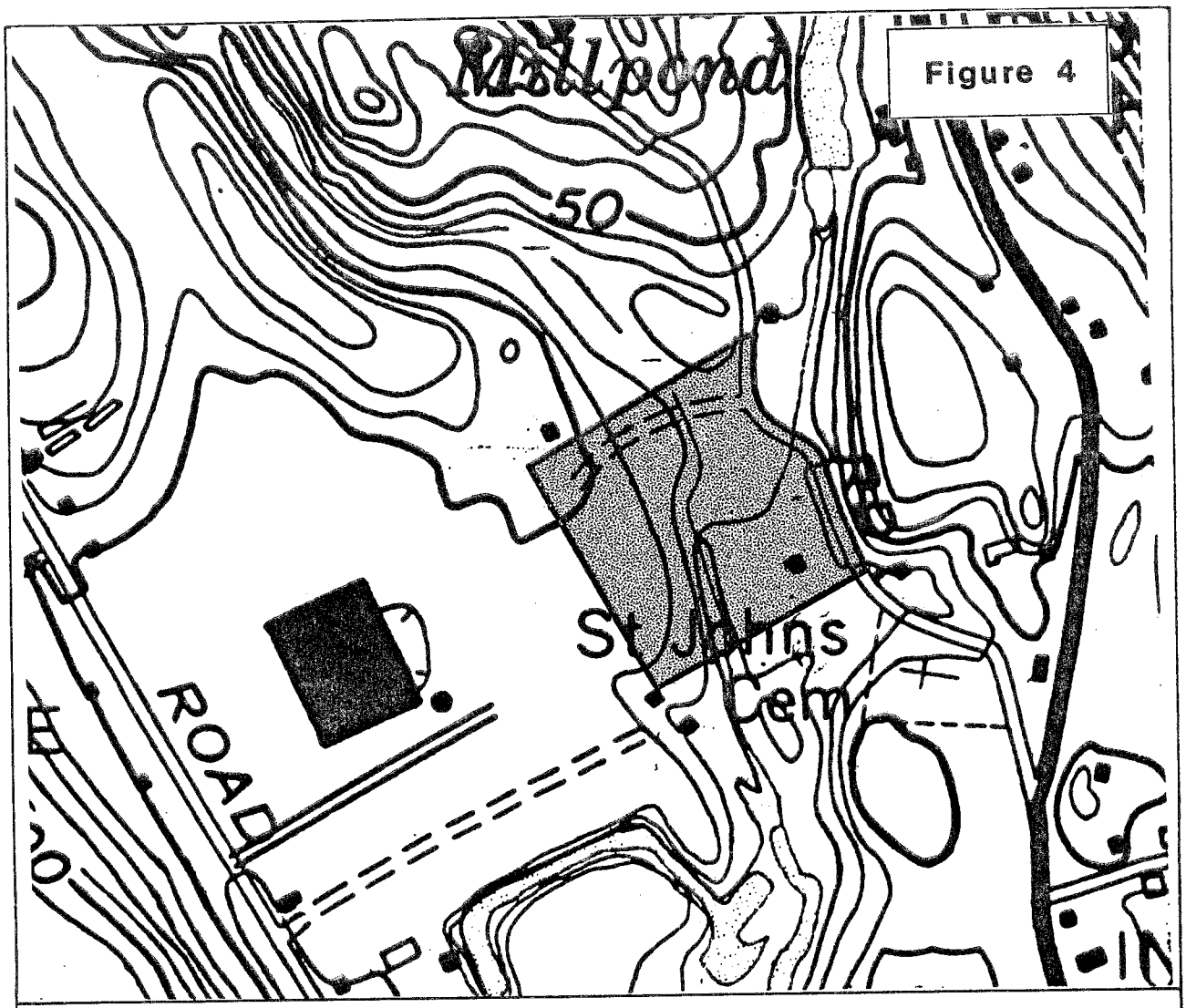
HUBBARD BRIDGE AND ROAD EXTENSION

GUILFORD, CONNECTICUT

TOPOGRAPHY

King's Mark Environmental Review Team

0 440'



MIDDLETOWN FORMATION - gneiss and amphibolite

HUBBARD BRIDGE AND ROAD EXTENSION

GUILFORD, CONNECTICUT

BEDROCK GEOLOGY

King's Mark Environmental Review Team

0 440'

boulders. However, soil borings would be needed in this area in order to get an accurate profile of the bedrock surface. This information would be extremely important to the town engineer, particularly for establishing a stable foundation for locating bridge footings.

Bernold describes the bedrock underlying the study area as a subunit of the Middletown formation. Those rocks consist of "gneisses" and "amphibolites" (i.e., rocks rich in amphibole minerals) composed of the minerals, plagioclase, quartz, hornblende and/or biotite. Gneisses and amphibolites are crystalline, metamorphic rocks, or rocks geologically altered by great heat and pressure. These rocks have usually been folded. The layering in the rock dips steeply to the northwest. The underlying bedrock should not pose any major problems in terms of the proposed project. Ideally, the footings and pilings used to support the proposed bridge should be placed on bedrock for optimal structural support.

Surficial Geology

Surficial geologic materials refer to unconsolidated rock particles and fragments that overlie solid bedrock. Most of the study area is covered by a glacial sediment called stratified drift, that was derived largely from the metamorphic rocks (i.e, gneisses, schists and amphibolites) underlying the area (Figure 5).

The variety of stratified drift material covering the site is referred to as "outwash." Outwash deposits consist of sand and gravel, typically finer-grained material, that were deposited by streams of meltwater downstream from an ice front. Except for a

narrow strip of land astride the west side of the river, outwash deposits cover the western section of the study area.

Overlying the outwash deposits along a narrow strip of the river on the west side, and throughout the eastern half of the study area are post-glacial sediments called "alluvium." Alluvial deposits consists of sand, silt, and gravel which may be mixed with organic matter. These deposits occur as a thin cover on the West River Valley floor.

Based on the present plans for the proposed project, the construction of the road and bridge will require 4,540 cubic yards of fill material. It appears that much of the fill material will need to be placed over alluvial soils. Filling and construction on the flood plain soils, like inland wetland soils, can have adverse environmental impacts because of the important hydrologic and ecologic roles they play. Some of these important roles include:

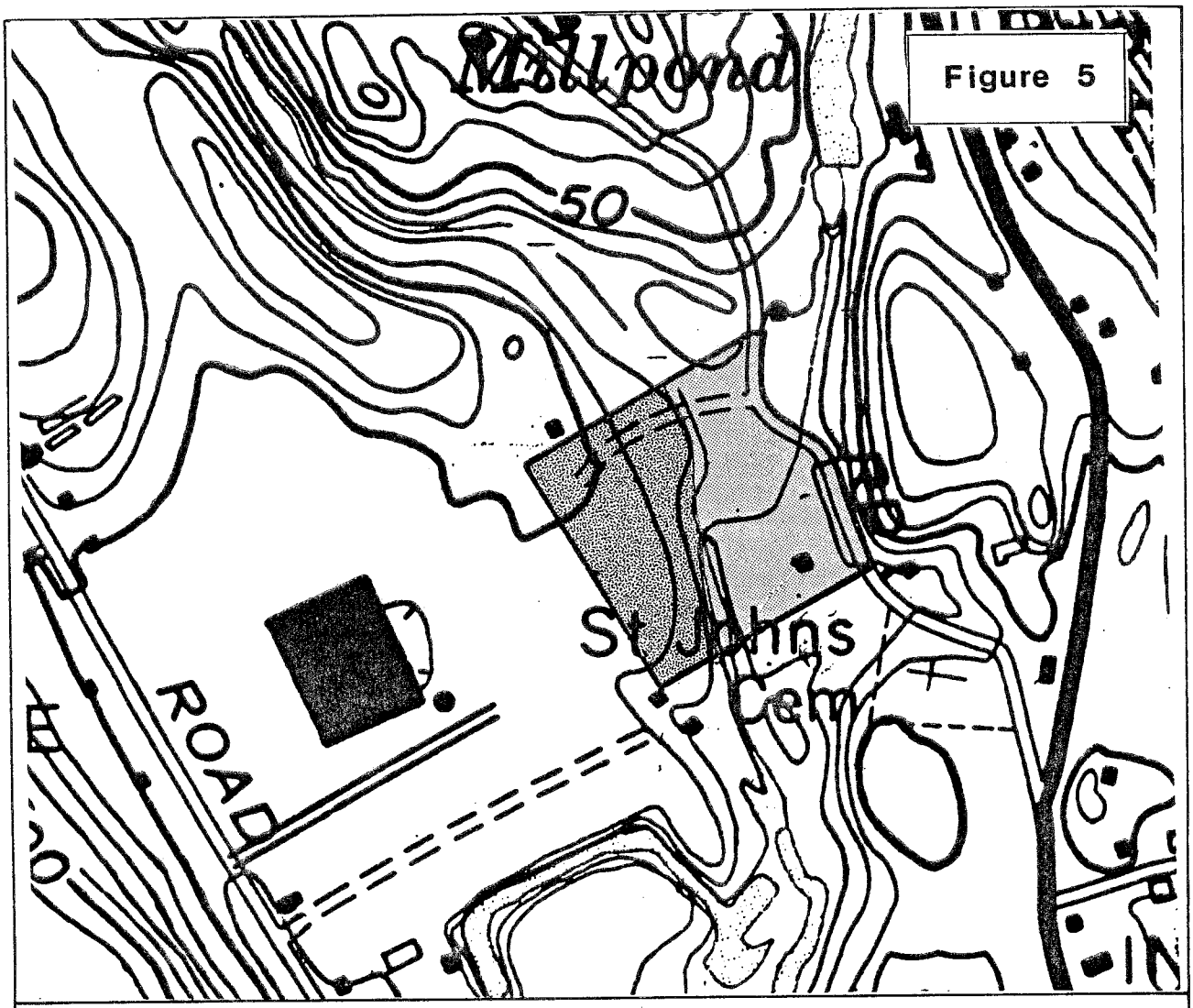
(1) forming natural flood ways that convey flood waters from upstream to downstream points;

(2) reducing runoff by storing water during times of flooding, and slowly releasing it to the downstream areas, thereby restricting flood peaks;

(3) maintaining water quality; and

(4) providing wildlife habitat.

In order to help protect these important functions, the filling of alluvial or wetland soils are regulated under Public Act No. 155 (Inland Wetlands and Water Courses Act). Therefore, the proposed wetland filling and modification will require a permit from the Town, and may be subject to public hearings. Based on the site plan, most



OUTWASH DEPOSITS (gravel, sand, silt and clay)

ALLUVIAL DEPOSITS

HUBBARD BRIDGE AND ROAD EXTENSION

GUILFORD, CONNECTICUT

SURFICIAL GEOLOGY

King's Mark Environmental Review Team

0 440'

of the wetland filling will need to take place on the east side of the river. Every effort should be made to reduce the impacts of the proposed construction on the flood plain through careful and judicious planning. All of the potential risks involved with allowing flood plain soils to be filled should be thoroughly assessed by the applicant. Any wetland areas disturbed by the proposed project should be reestablished to its former state.

As mentioned earlier, the alluvial soils in the study area, particularly on the east side, may contain some layers that have organic materials in them. Organic materials have no structural bearing capacities for the proposed road and bridge footings. Therefore, the Town should strongly consider the placement of soil borings along the proposed route which will provide the town engineer a good profile of subsurface conditions, including the determination of the bedrock surface discussed earlier.

Hydrology

The proposed road and bridge extension will span approximately 72 feet of a lower section of the West River. It should be pointed out that the area of the proposed crossing had been excavated in the past for irrigation purposes, and the West River narrows (approximately 30 feet) to the north and south.

The West River, draining an area of approximately 18 square miles or 11,520 acres originates in northeastern Guilford. It generally flows southward through Guilford enroute to Long Island Sound.

Existing land use patterns in the vicinity of the study area consist mainly of moderately dense residential housing along Long

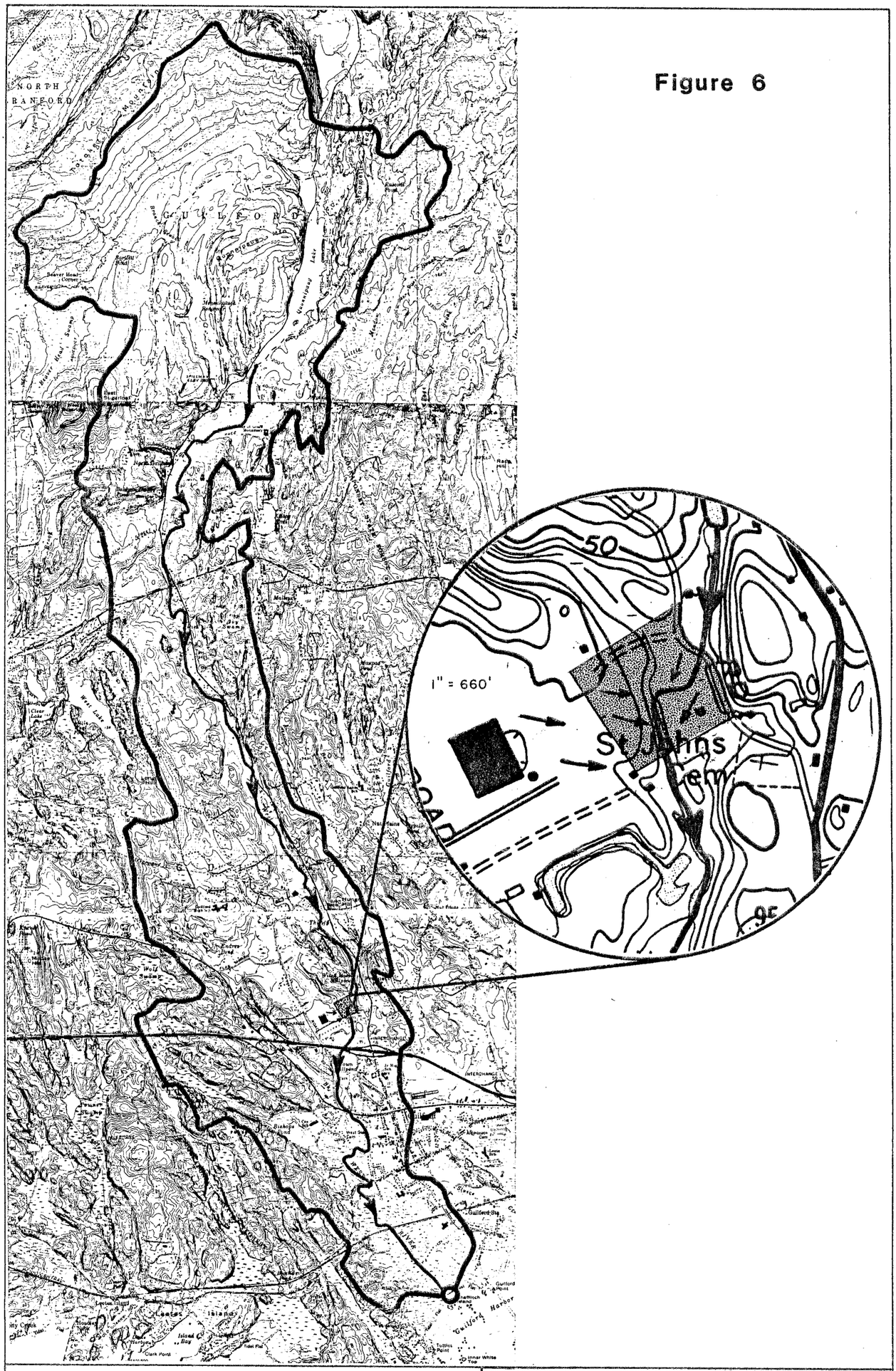
Hill Road and Saw Mill Road. Light commercial and industrial land uses are also present in the area. The West River corridor is composed predominantly of woodland and flood plains, interspersed with some open areas and agricultural lands.

The watershed boundary for the West River near the proposed site is relatively narrow (Figure 6). By definition, the watershed of West River comprises all land areas from which water drains into the river. As shown in Figure 6, the watershed boundary tends to follow the crests of local hills and ridges.

Precipitation resulting in surface runoff flows across the land until it reaches a stream, spring, seep, or other surface water body. Precipitation may also be absorbed into the ground, especially in those areas covered by permeable sands and gravel, such as outwash deposits. Once absorbed, the water may either be returned to the atmosphere through evaporation and plant transpiration, or it may percolate downward to the water table and eventually become groundwater. Once the water reaches the groundwater table, it moves downslope by the force of gravity, ultimately discharging to the surface in the form of springs, wetlands, streams, or directly into the West River. Water readily penetrates the permeable sands and gravels comprising the outwash deposits in the study area. Because of the highly permeable nature of these deposits, they are better able to absorb rainfall and release it to streams in dry weather.

To a large extent, groundwater flow in the watershed parallels the surface flow pattern. The installation of monitoring wells in the study area would allow for exact determination of groundwater movement. As mentioned earlier in this report, a hydrogeologic study

Figure 6



WEST RIVER WATERSHED AND ITS RESPECTIVE POINT OF OUTFLOW

WEST RIVER SHOWING DIRECTION OF FLOW

STUDY AREA

DIRECTION OF GROUNDWATER FLOW
(See text, Hydrology section)

HUBBARD BRIDGE AND ROAD EXTENSION

GUILFORD, CONNECTICUT

WATERSHED BOUNDARY

King's Mark Environmental Review Team

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was conducted for the AM Bruning facility located west of the study area. The proposed road and bridge extension would be constructed south and east of the AM Bruning property. Based on the hydrogeologic study, it was determined that groundwater flow at the rear of the AM Bruning property is in a southeast direction towards an existing open ditch running parallel to the proposed road and bridge extension. The study also found that the groundwater table in this area is on a relatively flat gradient.

According to a DEP publication entitled Connecticut Water Quality Standards and Criteria for the southcentral coastal areas, the West River is presently classified as a Class A stream. A Class A stream is defined as a surface water which may be suitable for drinking water supply and/or bathing; suitable for all other water uses; character uniformly excellent, and may be subject to absolute restriction on the discharge of pollutants.

A publication entitled, The Need for Aquifer Protection in South Central Connecticut identifies the "West River Aquifer," located along the lower portions of the West River, as one of the major aquifers in Guilford (Figure 7), and discusses ways to protect it. An aquifer is a geologic formation that is capable of yielding usable amounts of water to a well. Porous, permeable surficial deposits such as sand and gravel make good aquifers.

Connecticut Water Company well serving Guilford (i.e., about 5,000 customers) is located on the western side of the West River just south of the Connecticut Turnpike. According to information supplied to Team members on the review day, the well has a rated yield of 280 gallons per minute (GPM) or 400,000 gallons per day

(GPD). Based on this yield of 400,000 GPD, the well could serve up to 8,000 people per day assuming each person consumed 50 GPD.

The plan and profile for the proposed bridge and road extension was insufficient to determine the effects of drainage on the local water table and surface drainage in the study area. Nevertheless, if the project is properly engineered, and final plans closely followed, it seems likely that construction of the road and bridge could be done without significant change to the local water table and surface drainage. The potential for changes in terms of surface drainage and groundwater would be expected to be greatest during the actual construction periods. This subject is discussed later in this section of the report.

Special attention should be given to the following areas during the planning and designing stages:

(1) designing the road and bridge so that there is minimal interference with natural drainage in the area;

(2) designing the road and the bridge opening to meet local floodway regulations in order to convey major storm water so that flood flows are not blocked, which may lead to increased flood levels and velocities on other nearby lands;

(3) equalizer pipes should be properly sized and installed, especially on the eastern side;

(4) surface runoff created by this new road and bridge should be properly estimated and handled; and

(5) preparation of an erosion and sediment control plan for all phases of the proposed project which will help protect the river from siltation and reduce erosion.

Construction should take place during the dry time of year to help minimize the chance for erosion problems.

A water-related concern expressed by town officials on the

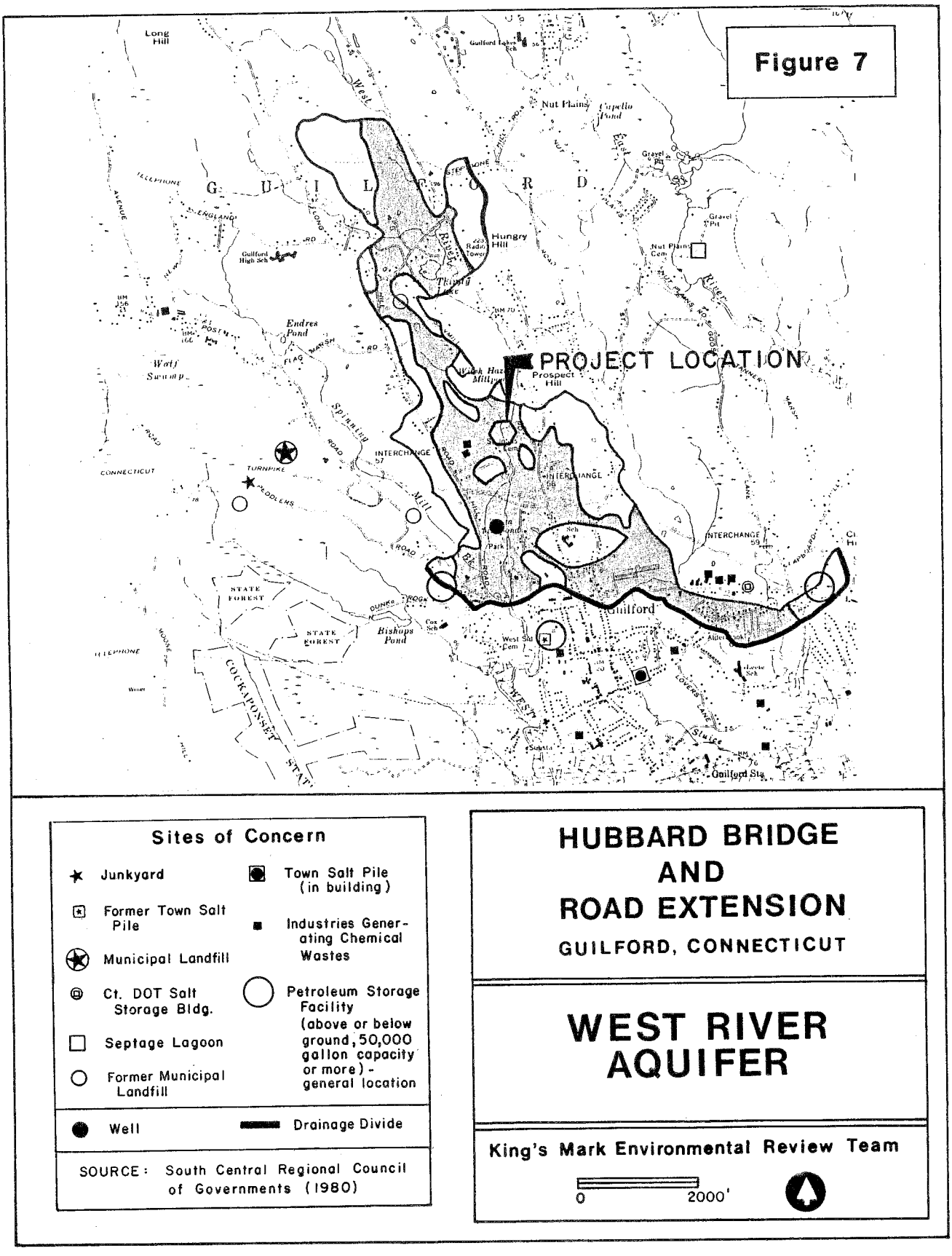
Figure 7
PROJECT LOCATION
GUILFORD
Long Hill
Nut Plains
Hungry Hill
Prospect Hill
Endres Pond
Wolf Swamp
Bishops Pond
Thimble Islands
Guilford
Guilford Sta
Sites of Concern
Junkyard
Former Town Salt Pile
Municipal Landfill
Ct. DOT Salt Storage Bldg.
Septage Lagoon
Former Municipal Landfill
Town Salt Pile (in building)
Industries Generating Chemical Wastes
Petroleum Storage Facility (above or below ground, 50,000 gallon capacity or more) - general location
Well
Drainage Divide
SOURCE: South Central Regional Council of Governments (1980)
HUBBARD BRIDGE AND ROAD EXTENSION
GUILFORD, CONNECTICUT
WEST RIVER AQUIFER
King's Mark Environmental Review Team
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2000'

review is the effect of future runoff from the proposed bridge and road extension on water quality of the West River.

Runoff from the road, like most paved roads or parking areas, is likely to be contaminated with de-icing compounds (i.e., road salt during winter months) plus hydrocarbons, automobile residues, and the like. Some of these contaminants finding their way into the wetlands or flood plains paralleling the West River may be purified or removed to some degree. It is unlikely that they could completely remove them all. If these contaminants find their way directly into the river, without any wetland renovation, they represent even a greater threat to water quality. Since the lower portion of the West River is an important aquifer in Town, and the public water supply well serving Guilford is more or less 2,250 feet downstream from the proposed bridge and road extension, every effort should be made to protect the river from the transportation-related contaminants mentioned above. To illustrate this, winter salt and sand may be carried directly to the river by the storm drainage system if curbing is used. Without curbing roadway drainage will sheet flow to the edge of road where most of the sand will be deposited. De-icing salts will also be carried to the edge of road. Some of the salt would remain in soil solution, or be absorbed by the soil. The salt that remains in solution would be flushed to the West River, diluted and carried to the coast. Since it appears that the road will be constructed on a relatively flat level, it seems likely that lesser amounts of road salt and sand will be required. Nevertheless, the Town should consider minimizing the uses of road salt and sand in this area. It should be pointed out that the Connecticut Turnpike is

located about 1,000 feet upstream of the Guilford well. In order to minimize the potential for deterioration of water quality of the West River from the proposed project, the installation of a sediment retention basin (s) during excavation and construction should be considered. They would reduce downstream siltation and need to be maintained on a regular basis to provide continued effectiveness.

A representative from the Connecticut Water Company was available during the field review to answer questions regarding the "Guilford Well" mentioned earlier in this report. Their primary concerns regarding the proposed road and bridge construction with respect to the "Guilford Well" are:

(1) filling and land alteration within a critical inland wetland, and water course system;

(2) increased erosion and sedimentation affecting the West River and its wetland system;

(3) operation of equipment on-site during the actual bridge and road construction; (provisions must be made for containing any potential gasoline, oil, or other hazardous material spills on site during construction); and

(4) the potential effect of the bridge and roadway design on future land use in the area;

This report, entitled "Guilford Well" includes a map of the well's zone of influence (i.e., the area where the water table is lowered during pumping periods). Based on this map, the northern boundary for the wells zone of influence terminates at the Connecticut Turnpike. According to the diagram, it does not encompass the study area. However, it should be pointed out that there are several factors such as precipitation, land use and pumping rates that can cause the boundaries for the well's zone of influence

to expand or contract. In addition to the above map, there is a map within the report indicating that the site lies within the primary recharge area for the "Guilford Well." The Connecticut Water Company defines the "Primary Recharge Area" as the area immediately overlying the aquifer and adjacent areas of stratified drift (i.e., sand and gravel) that may not have the saturated thickness to be part of the aquifer. Stratified drift deposits with saturated thicknesses of 10 feet or more are considered part of the aquifer.

Since the site is located within the primary recharge zone of the "Guilford Well," every effort should be made by the Town and the Connecticut Water Company to monitor any type of activity that may deteriorate the water quality of the well. Therefore, the Team's geologist generally concurs with the potential environmental concerns raised by the Connecticut Water Company regarding the proposed bridge and road extension. Presently, the well is only treated for elevated iron and manganese levels.

It seems likely that the proposed project should not adversely effect the "Guilford Well" provided that:

(1) the aforementioned concerns are adequately addressed;

(2) the project is carefully planned, with all construction activity closely supervised and monitored;

(3) road salting is minimized; and

(4) a detailed erosion and sediment control plan is closely followed.

Construction impacts within the West River proper can be minimized by either silt curtains, cofferdams, or proper de-watering techniques. If there is a need to de-water the excavations for bridge footings, it should be determined if there will be any mutual

interference with the "Guilford Well" during pumping periods.

De-watering would probably not be necessary, particularly if construction is done during the dry time of year. However, if pumping is required, consideration should be given to where the water will be pumped to. For example, if the water pumped from the excavation is directed to the West River, and if there is an impervious barrier such as silt layer beneath the stream bed, groundwater normally providing primary recharge to the West River aquifer would be lost, unless it was pumped back into the aquifer through the impervious barrier.

Soil Resources and Characteristics

Introduction

The soil map and narrative are a revision of the data contained in the Soil Survey of New Haven County, Connecticut. The letter symbols on the map identify map units. Each map unit symbol has a unique composition of soils. Areas with the same symbol have the same composition. Only those map units that will be crossed by the road and bridge extension are described below.

Major Soil Units

Map Units Ru and Ps

These soils are composed primarily of Rippowam and Pootatuck soils, respectively. These soils are on the flood plain of the West River, and are inland wetlands (Figure 8). The poorly drained Rippowam soils have a seasonally high water table at a depth of less than 20 inches. The moderately well drained Pootatuck soils have a seasonally high water table between the depths of 20 and 30 inches. These soils have fine, sandy loam textures to a depth of 60 inches or more.

Both soils are flooded by the West River during large storm events. The proposed filling of this wetland area will limit the natural storm water retention function of this area. This in turn may aggravate any existing downstream flooding problems.

The shallow water table of the Rippowam soil creates good wetland wildlife habitat. The loss of this area due to filling the site should not be of great significance since much more of this

habitat is located along the river.

Map Units ChB and ChC

These soils are composed primarily of Charlton soils on slopes of less than 15 percent. Charlton soils are very deep and well drained. Textures are dominantly fine sandy loam to a depth of 60 inches or more (see Figure 8). At this location, the Charlton soils formed in water worked glacial till. As a result, these soils have some strata containing 15 to 25 percent rounded gravels and cobbles.

Erosion and Sediment Control

All soil erosion and sediment control planning for this project should follow the planning principles found in Chapter 3 of Guidelines for Soil Erosion and Sediment Control (1985).

The following principles should be emphasized in the overall erosion and sediment plan:

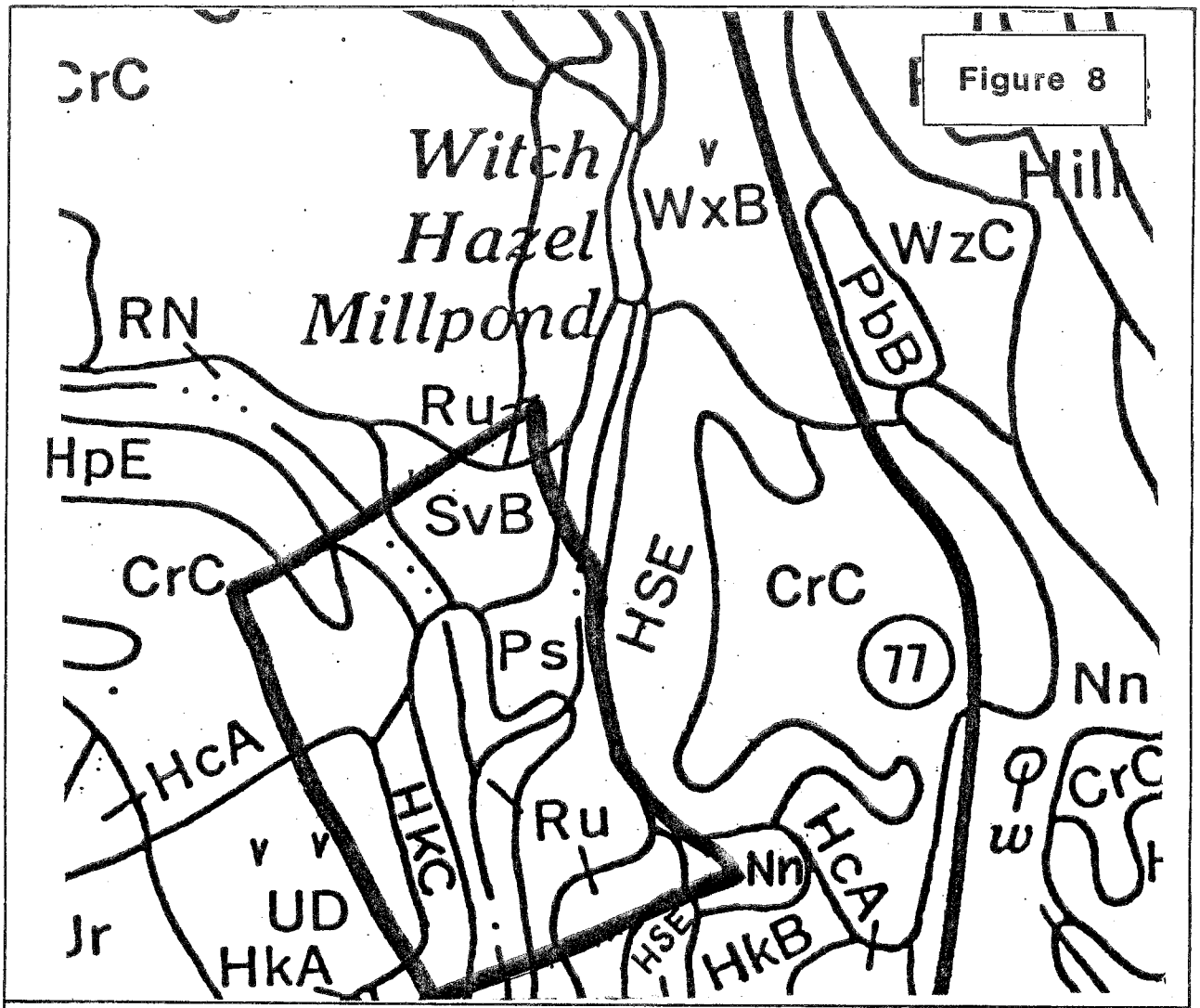
(1) The sequence of major construction activities.

(2) The disturbed areas should be kept as minimal in size as possible.

(3) During construction, surface water moving overland toward the West River should be directed around the project site by temporary diversions.

(4) Also during construction, the use of sediment barriers and temporary mulching should be called for in the final erosion and sediment control plan.

(5) As soon as an area of the site is finally graded, it should be topsoiled, fertilized, seeded, mulched, and netting should be used to hold the seed and mulch in place until the grass can get established.



Soils map adapted from smaller scale map (1" = 1320') and should not be viewed as precise boundaries but rather as a guide to the distribution of soils on the site.

SOURCE: New Haven County Soil Survey, USDA, Soil Conservation Service

HUBBARD BRIDGE AND ROAD EXTENSION

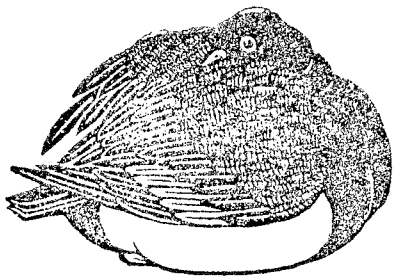
GUILFORD, CONNECTICUT

DISTRIBUTION OF SOILS

King's Mark Environmental Review Team

Specific assistance on the development of the final soil erosion and sediment control for this site is available through the New Haven County Soil and Water Conservation District, 322 North Main Street, Wallingford, Connecticut.

BIOLOGICAL RESOURCES



BIOLOGICAL ATTRIBUTES

Forestry and Wildlife Characteristics

Introduction

The study area may be divided into six vegetative types. These include: (1) mixed hardwoods; (2) old fields; (3) flood plain wetland; (4) hardwood swamp; (5) open fields; and (6) plantation. Excluded from this assessment is a one acre municipal animal pound also located within the study area.

No rare or endangered plant or animal species have been reported as being located or observed within the study area.

Vegetative Type Descriptions

Mixed Hardwoods (Type A)

The overstory in this fully-stocked to over stocked stand is made up of pole (i.e., 5" to 11" diameter breast height or dbh) and scattered sawtimber (i.e., 11" or more dbh) size red oak, black oak, white oak, red maple, black birch, tulip tree, white ash, shagbark hickory, mockernut hickory, and occasional American beech (Figure 9). Some of these trees are declining in health and vigor due to crowding, and stress brought on by gypsy moth and two-lined chestnut borer infestations. The understory vegetation in this area is dominated by witch hazel, maple-leaf viburnum, blue beech, hop hornbeam, highbush blueberry, and scattered dense patches of mountain laurel. The understory vegetation on the higher, drier

side hills includes eastern red cedar and hemlock. Ground cover and herbaceous vegetation consists of lowbush blueberry, huckleberry, hay scented fern, Christmas fern, evergreen wood fern, sedges, and club mosses. Approximately one acre of a two-aged mixed hardwood stand (Type A) is present within this area. It is made up of healthy, well spaced, large sawtimber-size black, red and white oak over topping an understory of eastern red cedar, bluebeech, flowering dogwood, mountain laurel, and hardwood tree seedlings (i.e., less than 1" dbh). Greenbrier, Japanese honeysuckle, grasses, sedges, and club mosses form the herbaceous ground cover. Poor access, steep slopes, and rockiness make both of these mixed hardwood areas difficult to manage for the production of timber products. Aesthetics and recreational opportunities could be improved, however, by felling poor quality, unhealthy trees to clear trails, and create more sunlight to stimulate flowering of mountain laurel thickets.

Old Field (Type B)

The old field areas are dominated by sapling (i.e., 1" to 5" dbh) to pole-size eastern red cedar, with seedling to sapling size red oak, black oak, red maple, mockernut hickory, black cherry, chokecherry, hemlock, white pine, gray birch, and tulip tree intermixed. Several poor quality large sawtimber-size red maple and sycamore trees are also scattered throughout this type. The shrub species which are present include bluebeech, autumn olive, staghorn sumac, smooth sumac, old field juniper, highbush blueberry, mountain laurel, shadbush, burning bush, bayberry, multiflora rose, alternate-leaved dogwood, and several species of viburnum.

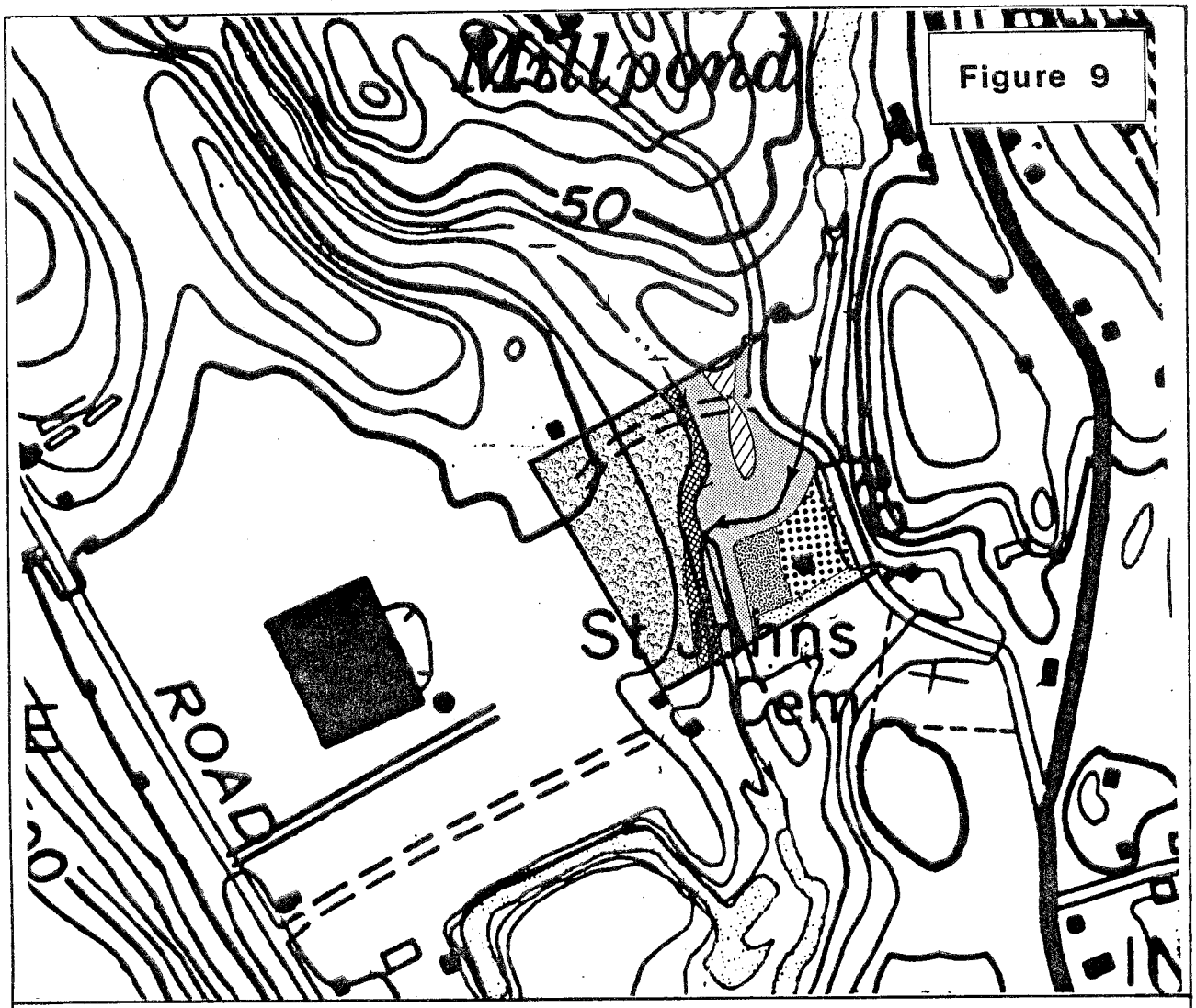


Figure 9

MIXED HARDWOODS (Type A)

OLD FIELD (Type B)

FLOOD PLAIN WETLAND (Type C)

HARDWOOD SWAMP (Type D)

OPEN FIELD (Type E)

PLANTATION (Type F)

ROAD

WEST RIVER

STREAM

TRAIL

TOWN-OWNED LAND

HUBBARD BRIDGE AND ROAD EXTENSION

GUILFORD, CONNECTICUT

FOREST TYPES

King's Mark Environmental Review Team

0 440'

Herbaceous vegetation includes grasses, goldenrod, poison ivy, pokeberry, greenbrier, Japanese honeysuckle, and brambles. Many of these species provide excellent food and cover for wildlife.

Flood Plain Wetland (Type C)

A flood plain wetland is located along the West River. This type is understocked with poor quality pole to sawtimber-size white ash, red maple, sycamore, sassafras, American elm, and occasional eastern red cedar. The shrub species include deciduous holly, swamp rose, smooth sumac, spice bush, silky dogwood, highbush blueberry, and barberry. Ground cover and herbaceous vegetation is made up of grasses, sedges, poison ivy, Japanese honeysuckle, aster, greenbrier, brambles, Japanese knot weed, cinnamon fern, sensitive fern, tussock sedge, and sphagnum moss. This area also provides excellent wildlife habitat.

Hardwood Swamp (Type D)

Poor quality, sapling and pole-size red maple in clumps on hummocks dominate this variably stocked area. Scattered white ash and black gum are also present along with occasional brown ash and sycamore. Understory vegetation includes sweet pepperbush, spice bush, highbush blueberry, slippery elm, speckled alder, smooth alder, deciduous holly, arrow wood, nannyberry, swamp dogwood, silky dogwood, button bush, silky willow, wisteria, swamprose, and barberry. Sphagnum moss, tussock sedge, skunk cabbage, false hellebore, cinnamon fern, sensitive fern, swamp loosestrife, blue flag, poison ivy, club mosses, and horsetails form the herbaceous

ground cover in this area. Tree growth potential is limited by the presence of a high water table and saturated soils. Under these conditions, the trees which are present are shallow rooted, and unable to become securely anchored, causing a high potential for wind throw. Management of this area for the production of wood products is not feasible.

Open Field (Type E)

This open field area is in early successional stages as is the old field (Type B). Grasses and goldenrod dominate, with seedling to sapling size eastern red cedar, red oak, black oak, red maple, black cherry, and mockernut hickory just beginning to become established. Other species present include gray stemmed dogwood, staghorn sumac, gray birch, chokecherry, bayberry, barberry, black-eyed susan, poke berry, multiflora rose, autumn olive, Japanese honeysuckle, poison ivy, poverty grass, haircap moss, and assorted wildflower and weed species. The production of this area could be improved by interplanting a combination of white pine and larch spaced approximately 15 feet apart.

Plantation (Type F)

Sapling to pole-size eastern white pine and larch are present in this fully-stocked plantation. Multiflora rose has become established around the edges of this plantation. Where sunlight reaches the plantation floor, grasses and goldenrod have flourished. This plantation should be evaluated in about 10 years to determine if removal of the poorest one-fourth of the trees would be beneficial to the health and vigor of the residual trees.

Effect of the Proposal on Vegetation and Wildlife

Impact of the proposed road and bridge extension on vegetation should be minimal. The vegetative types that will be disturbed (i.e., flood plain wetland and old field) do not support any large quality trees. The few poor quality trees that are now present, and will ultimately have to be removed, do provide shade for trout in the West River. The new bridge, however, will provide more shade than the few trees that are to be removed.

Changes in drainage patterns caused by the road and bridge extension may have an effect on plant and animal species composition. For example, if long term soil moisture is altered (i.e., from moist to dry conditions), plant species composition and diversity will change with a new soil moisture regime. Thus, as water-loving plant species are unable to survive in dryer soil conditions, other plant species that are better adapted to these new environmental conditions will become established. This change or transition to new species composition is usually a slow process.

Yet, as the vegetation changes so do the species of wildlife that utilize the vegetation for food and cover. At present, the area most likely to be disturbed has extremely high value for wildlife. The fruiting shrubs that are present provide excellent fall and winter food for many species of birds and mammals. These dense and sometimes thorny shrubs also provide year-round cover for wildlife. Though many of the shrubs utilized by existing wildlife species have wide moisture tolerance levels, and any alterations in soil moisture should not significantly impact these shrubs, the impacts will be greater on wildlife species dependent on existing vegetation.

Fishery Resources

Introduction

The West River is one of the most valuable trout streams in New Haven County. The River supports a wild brook trout population that is supplemented by an annual State stocking of 850 yearling trout. The stream receives moderate to heavy fishing pressure during the early spring, and light pressure the remainder of the season.

The proposed bridge site for the Hubbard Road extension spans an excellent stretch of the West River. The River's bottom consists of cobble and gravel, ideal for the insects that the trout depend on for food. A large pool currently exists immediately below the proposed bridge site.

Impact Mitigation

Several measures should be implemented to minimize the impact of the Hubbard Bridge and Road Extension on the West River fishery resources. They are:

(1) Do not alter the stream bottom in any way. The bridge should completely span the River.

(2) Implement proper erosion and sedimentation control measures to protect downstream areas from siltation.

(3) Limit tree cutting as much as possible within 50 feet of the River's edge. The trees help to stabilize the River's banks, and provide shade to help cool stream water during summer months.

(4) Minimize work near the river between April 15th and May 15th to limit the impact on the trout fishermen.

Attention to these concerns will minimize the environmental impact of this project to riparian fishery resources.

Wetland Characteristics

Wetland Types

The on-site wetlands are typified by the following features:

(1) Well drained, altered wooded riverbank wetland type on the western side of the West River;

(2) The West River proper;

(3) The moderately well drained, nearly level wooded flood plain on the eastern bank of the West River;

(4) The poorly drained, scrub-shrub swamp adjacent to Saw Mill Road.

Wetland Functions

The above wetland types can be expected to perform the following functions in their existing location and condition:

(1) The existing westerly riverbank of the West River serves the following functions: (a) conveys flood flows; (b) provides a location for dry access to the river for recreational users; and (c) its trees provide shade to this section of the river, and for the artificially excavated pool in the vicinity of the proposed river crossing. The area presently exhibits some significant erosion due to runoff from the terminus of Hubbard Road.

(2) The West River varies from 50 to 70 feet in width owing to the artificial excavation to create a pool (i.e., perhaps for irrigation). The river in this area is characterized by brisk flow and coarse gravel substrate. Water quality appears excellent, and this location is considered to be valuable for fishery purposes, and use by small mammals and occasional waterfowl.

(3) The lightly wooded, nearly level flood plain adjacent to the easterly bank of the West River provides an overbank area for flood water conveyance. Tree and light brush cover provides habitat for birdlife, and perhaps some small mammals and an occasional deer. The area is presently used

for grazing by an adjacent property owner. A small artificial drainage swale traverses a portion of this site. This probably existed as an historic agricultural drainage practice to dry up this area for use as pasture.

(4) The poorly drained scrub-shrub wetland is approximately one-third acre in size. It's primary function is to receive runoff waters from adjacent land, and provides substantial food species such as blueberry, winterberry, alder, and leather leaf for wildlife. The primary value of this area would be as habitat for birdlife, amphibians, and small mammals.

Potential Environmental Impacts

The impacts on wetlands of the proposed road and bridge extension can be portrayed as either short term or long term. Short term effects will most likely be limited to disturbance to the stream bed during installation of the culvert/bridge structure as a result of siltation. Long term impacts will be as a result of the loss of habitat from roadway fills and the change in stream bed characteristics at the roadway crossing of the West River due to construction activities. Additionally, there will be a degree of loss of isolation from man and vehicle noise by the introduction of the roadway. While the west bank area shows evidence of relatively frequent use by hikers and fishermen, the east bank and wetland area appears to receive little intrusion from man. Intrusion will most likely increase due to the increased accessibility offered by a roadway and bridge in this location. The scrub-shrub swamp area is not particularly isolated at present since if is abutted by Saw Mill Road, a residential driveway, and the town animal pound. A slight decline in long term water quality may occur as a result of the introduction of roadway runoff from the new portion of road to be constructed.

Impact Mitigation

The impacts anticipated from the proposed project can be partially mitigated by:

(1) Minimizing the extent of roadway fills in critical locations. This may be accomplished by increasing the steepness of roadway embankments and protecting such slopes by placement of a rock blanket, slope paving, or retaining walls.

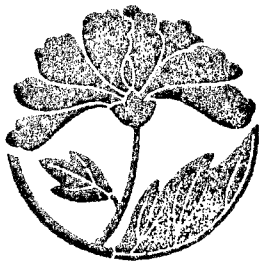
(2) Employing proper sediment and erosion control practices during construction. For bridge construction this may entail placement of cofferdams to isolate abutment construction activities from the West River. The toe of all roadway embankment fills should be protected by the placement of silt fencing. All exposed soils should be mulched and seeded immediately upon completion of grading activities.

(3) Installing proper dissipation of storm water discharges from the roadway surface. Wherever possible, storm water should be discharged to locations that will allow for overland flow, and filtration of sediments and pollutants. Plunge pools or level spreaders will serve to minimize scour, and aid in settling road sands.

(4) The loss of a portion of the scrub-shrub swamp may be mitigated by compensatory excavation of adjacent land to the north of the proposed roadway. Excavation of one to two feet of earth in this area can be used to expose substrate which will be saturated for a longer period of time during the year, and hence stimulate the growth of emergent/submerged wetland plant species which would provide greater habitat value.

(5) Plantings to encourage wildlife and birdlife may be located in and around the compensation area as well as the roadway embankment. This area can serve as a buffer, and provide food and cover. Any wetland creation plan should be carefully designed to create soil saturation conditions encouraging the growth of desireable plant life. Additionally, introduction of storm water runoff to this location will probably provide the best water quality renovation while increasing the desired water to create saturated conditions.

LAND USE
AND
PLANNING CONSIDERATIONS



LAND USE AND PLANNING CONSIDERATIONS

Surrounding Land Use

At present, the adjacent land northeast of the study area is used for an animal pound. Further east of the proposed road and bridge extension is a veterinary hospital. Land west of the proposed bridge and road extension is occupied by the AM Bruning Company and open space. The land north of the proposed site is presently undeveloped. A private residence occupies the southern boundary of study area.

Traffic and Access

The proposed Hubbard Road and Bridge Extension is designed to connect two major north-south roads: Long Hill Road and Route 77 via Saw Mill Road. The new road and bridge will provide an east-west access route north of the Connecticut Turnpike (I-95) and Route 1. The proposed project intersects Saw Mill Road at the point of greatest visual sighting, and produces the simplest travel patterns. The bridge and road extension is designed to alleviate traffic congestion in the following areas: (1) at the intersection of Long Hill Road and Route 1; (2) along the stretch of Route 1 which is commercially developed; and (3) at the intersection of Route 1 and Saw Mill Road. This is not to be construed that traffic congestion will cease, but peak hour traffic will be diminished. There are approximately 9,300 vehicles per day on Route 77 south of its intersection with Saw Mill Road, and 3,000 vehicles per day on Saw Mill Road. Some vehicular traffic will be reduced or diverted by the

proposed bridge and road extension. Vehicular noise in the area will be negligible.

Town Master Plan

The Guilford Master Plan and Zoning Map permit the proposed bridge and road extension. In fact, it encourages the construction of an east-west artery in this general location. Much of Guilford's road system transports vehicles in a north-south configuration, and a road in this area would benefit the community as a whole.

The lack of intensive development permits the proposed bridge and road extension to be constructed without displacement of persons or destruction of existing structures. Fencing in the proposed development area will be unnecessary since there is some in place along the animal pound and veterinary facilities.

Recreational Opportunities

The riverbank, surrounding undeveloped uplands, and inland wetlands are used for passive recreation activities such as hiking, birdwatching, and fishing. This is unimproved land, and the on-site trails are maintained by the people using them. The trails, however may be quite hazardous during wet weather conditions. Posting interpretative or safety warning signs along the trail to lessen the risk of injury is encouraged. The study site is near existing residential areas, and is utilized by organized groups such as the Boy and Girl Scouts, and fishing groups. The proposed bridge would be a potential site for fishing if a small access area were incorporated into the bridge and road design. The construction and

maintenance of hiking trails should also be encouraged in the design plans.

Although there are other places within Guilford where one may enjoy outdoor passive recreation, the careful development of this area into a hiking, fishing, or birdwatching area would benefit the entire community.

Discussion

The West River and its associated wetland communities offer scenic beauty, and have a high aesthetic value. A properly designed bridge and road would encourage the conservation of these unique resources, and provide important recreational amenities. This could become a important community asset. The road and bridge need not be forbidding, but compatible with the surrounding "rural" character of the area.

APPENDIX A

SOILS LIMITATION CHART

SOILS LIMITATION CHART - HUI :D ROAD AND BRIDGE EXTENSION ERT

BUILDING SITE DEVELOPMENT

SOIL SYMBOL	SOIL NAME	SHALLOW EXCAVATIONS	DWELLINGS W/O BASEMENTS	DWELLINGS W/BASEMENTS	LOCAL ROADS	SEPTIC TANK	CONST. MATERIALS ROADFILL
CrC	Charlton 3-15% Slope	Severe: Large Stones	Severe: Large Stones	Severe: Large Stones	Moderate: Large Stones	Severe: Large Stones	Fair: Large Stones
	Hollis 3-15%	Severe: Depth to Bedrock, Large Stones	Severe: Depth to Bedrock, Large Stones	Severe: Depth to Bedrock, Large Stones	Severe: Depth to Bedrock	Severe: Depth to Bedrock Large Stones	Poor: Thin Layer Area Reclaim
HcA	Haven 0-3% Slope	Severe: Cutbanks Cave	Slight	Slight	Slight	Slight	Good
HkC	Hinckley 8-15% Slope	Severe: Small Stones, Cutbanks Cave	Moderate: Slope	Moderate: Slope	Moderate: Slope	Moderate: Slope	Good
HpE	Hollis 15-35% Slope	Severe: Slope, Depth to Bedrock, Large Stones	Severe: Slope, Depth to Bedrock, Large Stones	Severe: Slope, Depth to Bedrock, Large Stones	Severe: Slope, Depth to Bedrock	Severe: Slope, Depth to Bedrock, Large Stones	Poor: Thin Layer, Slope, Area Reclaim
HSE	Hollis 15-35% Slope	Severe: Slope, Depth to Bedrock, Large Stones	Severe: Slope, Depth to Bedrock, Large Stones	Severe: Slope Depth to Bedrock, Large Stones	Severe: Slope Depth to Bedrock	Severe: Slope, Depth to Bedrock, Large Stones	Poor: Slope, Thin Layer, Area Reclaim
	Rock Outcrop 15-35% Slope	-	-	-	-	-	-
Nn	Ninigret 0-3% Slope	Severe: Wetness	Moderate: Wetness	Severe: Wetness	Moderate: Frost Action	Severe: Wetness	Good
Ps	Podunk 0-3% Slope	Severe: Floods Wetness	Severe: Floods	Severe: Floods Wetness	Severe: Floods	Severe: Floods Wetness	Good

SOILS LIMITATION CHART - HU \RD ROAD AND BRIDGE EXTENSION ERT

BUILDING SITE DEVELOPMENT

SOIL SYMBOL	SOIL NAME	SHALLOW EXCAVATIONS	DWELLINGS W/O BASEMENTS	DWELLINGS W/BASEMENTS	LOCAL ROADS	SEPTIC TANK	CONST. MATERIALS ROADFILL
RN	Ridgebury 0-5% Slope	Severe: Wetness, Large Stones	Severe: Wetness, Frost Action, Large Stones	Severe: Wetness, Large Stones	Severe: Wetness, Frost Action	Severe: Percs Slowly, Wetness, Large Stones	Poor: Frost Action
	Leicester 0-5% Slope	Same As Above	Same As Above	Same As Above	Same As Above	Same As Above	Same As Above
	Whitman 0-5% Slope	Same As Above	Same As Above	Same As Above	Same As Above	Same As Above	Same As Above
Ru	Rumney 0-3%, Slope	Severe: Wetness Floods	Severe: Wetness, Floods	Severe: Wetness, Floods	Severe: Frost Action, Floods, Wetness	Severe: Wetness, Floods	Poor: Wetness
UD	Udorthents ± 15% Slope	-	-	-	-	-	-

		RECREATIONAL DEVELOPMENT		WILDLIFE HABITAT POTENTIAL		
SOIL SYMBOL	SOIL NAME	PICNIC AREAS	PATHS AND TRAILS	OPENLAND WILDLIFE	WOODLAND WILDLIFE	WETLAND WILDLIFE
CrC	Charlton 3-15% Slope	Severe: Large Stones	Severe: Large Stones	Poor	Fair	Very Poor
	Hollis 3-15% Slope	Same as above	Same as above	Poor	Poor	Very Poor
HcA	Haven 0-3% Slope	Slight	Slight	Good	Good	Very Poor
HkC	Hinckley 8-15% Slope	Moderate: Small Stones, Slope	Moderate: Small Stones	Poor	Poor	Very Poor
HpE	Hollis 15-35% Slope	Severe: Slope, Large Stones	Severe: Slope, Large Stones	Poor	Poor	Very Poor
HSE	Hollis 15-35%	Severe: Slope Large Stones	Severe: Slope, Large Stones	Poor	Poor	Very Poor
	Rock Outcrop 15-35% Slope	-	-	-	-	-
Nn	Ninigret 0-3% Slope	Slight	Slight	Good	Good	Poor
Ps	Podunk 0-3% Slope	Severe: Floods	Moderate: Floods	Fair	Good	Poor
RN	Ridgebury 0-5% Slope	Severe: Wetness Large Stones	Severe: Wetness Large Stones	Poor	Fair	Fair
	Leicester 0-5% Slope	Same as above	Same as above	Poor	Fair	Fair
	Whitman 0-5% Slope	Same as above	Same as above	Poor	Fair	Fair

		RECREATIONAL DEVELOPMENT		WILDLIFE HABITAT POTENTIAL		
SOIL SYMBOL	SOIL NAME	PICNIC AREAS	PATHS AND TRAILS	OPENLAND WILDLIFE	WOODLAND WILDLIFE	WETLAND WILDLIFE
Ru	Rumney 0-3% Slopes	Severe: Wetness	Severe: Wetness Floods	Fair	Fair	Good
UD	Udorthents ± 15% Slope	-	-	-	-	-

EXPLANATION OF RATING SYSTEM

LIMITATIONS:

1). SLIGHT LIMITATION: Indicates that any property of the soil effecting use of the soil is relatively unimportant and can be overcome at little expense.

2). MODERATE LIMITATION: Indicates that any property of the soil effecting 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: Soil limitations based upon USDA Soil Conservation Service criteria.

WILDLIFE HABITAT:

1). GOOD: The element of wildlife habitat or the kind of habitat is easily created, improved or maintained. Few or no limitations affect management, and satisfactory results can be expected if the soil is used for the designated purpose.

2). FAIR: The element of wildlife habitat or the kind of habitat can be created, improved or maintained in most places. Moderately intensive management is required for satisfactory results.

3). POOR: Limitations are severe for the designated element or land of wildlife habitat. Habitat can be created, improved or maintained in most places, but management is difficult and must be intensive.

4). VERY POOR: Restrictions for the element of wildlife habitat or kind of habitat are very severe and that unsatisfactory results can be expected. Wildlife habitat is impractical or even impossible to create, improve or maintain on soils having such a rating.

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, soil scientists, foresters, climatologists, landscape architects, recreational 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 83 town area serving western Connecticut.

As a public service activity, the Team is available to serve towns and/or developers within the King's Mark RC & D Area - free of charge.

PURPOSE OF THE ENVIRONMENTAL REVIEW TEAM

The Environmental Review Team is available to assist towns and/or developers in the review of sites proposed for major land use activities. For example, the ERT has been involved in the review of a wide range of significant land use activities including subdivisions, sanitary landfills, commercial and industrial developments, and recreational/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 indentifying the natural resource base of the site, and highlighting opportunities and limitations for the proposed land use.

REQUESTING AN ENVIRONMENTAL REVIEW

Environmental Reviews may be requested by the chief elected official of a municipality, or the chairman of an administrative agency such as planning and zoning, conservation, or inland wetlands. Environmental Review Request Forms are available at your local Soil and Water Conservation District, and the King's Mark ERT Coordinator. This request form 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 investigate. When this request is approved by the local Soil and Water Conservation District and King's Mark RC & D Executive Committee, the Team will undertake the review. At present, the ERT can undertake two (2) reviews per month.

For additional information regarding the Environmental Review Team, please contact your local Soil and Water Conservation District or Keane Callahan, ERT Coordinator, King's Mark Environmental Review Team, King's Mark Resource Conservation and Development Area, 322 North Main Street, Wallingford, Connecticut 06492. King's Mark ERT phone number is 265-6695.