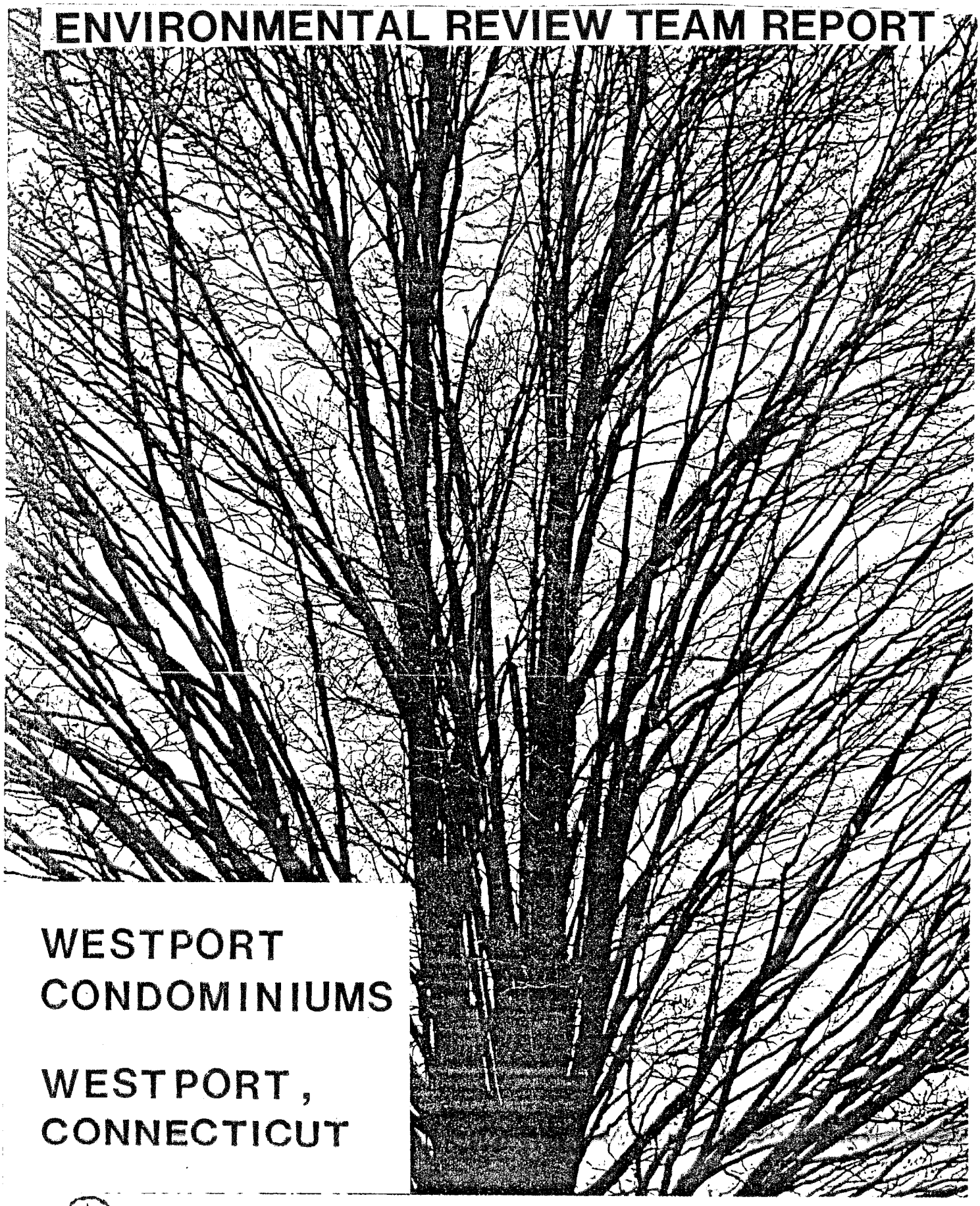
ENVIRONMENTAL REVIEW TEAM REPORT



WESTPORT CONDOMINIUMS

WESTPORT, CONNECTICUT

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

WESTPORT CONDOMINIUMS

WESTPORT, CONNECTICUT

Environmental Review Team Report

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

Wallingford, Connecticut

for the

Westport Conservation Commission

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 signficance to the proposed development and also suggests considerations that should be of concern to the developer and the Town of Southington. The results of the Team action are oriented toward the development of a better environmental quality and long-term economics of the land use. The opinions contained herein are those of the individual Team members and do not necessarily represent the views of any regulatory agency with which they may be employed.

MAY 1986

ACKNOWLEDGEMENTS

The King's Mark Environmental Review Team Coordinator, Keane Callahan, would like to thank and gratefully acknowledge the following individuals whose professionalism and expertise were invaluable to the completion of this study:

* William Warzecha, Geohydrologist
  Department of Environmental Protection

* Marc Beroz, Soil Resource Specialist
  U. S. Department of Agriculture, Soil Conservation Service

* Paul Rothbart, Wildlife Biologist
  Department of Environmental Protection

* Richard Carpenter, Executive Director
  Southwestern Regional Planning Agency

* Janet Wilscam McGee, Wetland Specialist
  Department of Environmental Protection

I would also like to thank Patricia Newton, Secretary, and Janet Jerolman, Cartographer of the King's Mark Environmental Review Team for assisting in the completion of this report.

Finally, special thanks to Ms. Fran Pierwola and Ms. Debbie Jacobson of the Westport Conservation Commission and Mr. Donald Ferlow of Environmental Design Associates for their cooperation and assistance during this environmental review.

EXECUTIVE SUMMARY

The Westport Conservation Commission requested an environmental review on a site proposed for condominium development. The proposed development site is located in the northwest section of Westport, south of the Merritt Parkway, adjoining Partrick Road to the east and Newtown Turnpike and a parcel of town-owned land to the west. Access is provided via an unpaved road off of Newtown Turnpike.

The study area is approximately 56 acres in size consisting primarily of inland wetlands, flood plain, open woodland and upland forest communities. A number of naturally occurring ponds also occupy the site. The western portion of the site has been disturbed by past quarry activities. It is deeply excavated in places, forming dug ponds and an uneven topography. Popular Plains Brook runs diagonally through the site in a northeasterly direction.

The Environmental Review Team 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 capabilities; and (4) presentation of planning and development guidelines. This review process enabled the Team members to arrive at an informed assessment of the site's natural resource development opportunities and limitations.

Preliminary site plans indicated that 100, four bedroom condominium units are proposed for this site. In order to prepare the site for development, 22 acres out of a total of 40 acres of designated inland wetlands would be filled or altered. Several detention ponds would also be created in areas presently occupied as

wetlands in order to increase habitat diversity and provide stormwater drainage. The development is to be served by public water and public sanitary sewers are to be extended to the proposed site by the developer.

The primary goal of the ERT was to provide natural resource information and data on the proposed site, and determine the possible adverse environmental impacts, if any, of the proposed condominium development. The Town specifically asked the Team to:

(1) assess the hydrogeological and soil characteristics of the proposed site;

(2) inventory and assess the existing vegetative characteristics and wildlife habitat on the proposed site;

(3) evaluate existing water supply and stormwater characteristics;

(4) determine the potential recreational opportunities of the site; and

(5) evaluate development limitations and opportunities of the proposed site.

Through the inventory and review process, specific resources, areas of special concern, and development limitations and opportunities were identified. They fall in three broad categories: (1) physical characteristics; (2) biological attributes; and (3) land use and planning considerations. They are summarized below.

PHYSICAL CHARACTERISTICS

Topography

The proposed development area was once the site of a sand and gravel extraction operation and quarry. As a result of this activity, the land surface has been extensively altered throughout the western and central portions.

The highest point on the site is the top of a bedrock knoll in the central portions while the lowest points comprise the surface water levels of ponds and wetlands.

Geology

Most of the bedrock underlying the site has been identified as a mixed felsic gneiss. Depth to bedrock on the site ranges from zero in the central portions of the study area where it breaks ground surface to about 60 feet near Poplar Plains Brook.

There are three types of surficial geologic deposits occuring on the site: (1) stratified drift; (2) shallow till; and (3) swamp deposits.

Geologic Development Concerns

The principal geologic limitations with regard to the proposed development include the following: (1) the presence of shallow to bedrock area in the central parts, which will require some blasting; (2) the "moonscape" topography in the western and central parts, which will require extensive improvements in order to make it suitable for development; (3) the presence of regulated inland wetland soils, some of which are proposed to be filled.

Hydrology

The former sand and gravel mining operation has significantly altered the surface drainage in the western and central parts of the study site. Surface drainage in the eastern parts is mainly downslope towards Poplar Plains Broook. The artificially created ponds in the mined area do not appear to have outlets.

Groundwater beneath the site is classified as GA. A "GA" classification means the groundwater may be suitable for public or private drinking water use without treatment.

The proposed 100 condominium units will be served by public water and sewer. The availability of these utilities to the site should help decrease the likelihood of groundwater contamination.

Development of the site for 100 condominium units can be expected to lead to increases in stormwater runoff. The amount of increased runoff will depend largely on the density and extent of development on the property, amount of impervious surfaces created, and the timing of development.

In order to prevent flooding problems arising from the proposed development, the developer plans to enlarge existing ponds and at least two new ponds would be created. These ponds would be created for runoff/flood storage function as well as for aesthetics.

Soils

The Palms soils on the site (Aa map unit) contain organic materials which have very poor bearing strength. These materials will have to be removed before any structures or roads can be built in this area.

The Hinckley soils (HkC soil unit) should not present any construction difficulties during site development. It should be noted that cutbanks of excavations will be unstable and will cave-in due to the soil's sandy and gravelly textures.

There are three former borrow pit soil map units on the site. Two areas (Pr1 amd Pr2) have deep soils, with Pr1 having many areas of inland wetlands and Pr2 having few inland wetland areas. Pr2 will also require extensive earth moving in order to smooth the irregular and steep slopes. Pr3 is composed of shallow soils and rock outcrops, and any cuts into this material will require blasting.

BIOLOGICAL ATTRIBUTES

Inland Wetlands

Close to 34 acres or 62 percent of the site is occupied by inland wetlands. An estimated 23 acres of these wetlands are located within the flood plain of Poplar Plains Brook. An additional eight acres of wetlands are underlain by aquic udorthents or soils which have been altered by man's activities.

The wetland's significance is partly attributable to its size. Within the flood plain, the wetlands are relatively undisturbed and have a well developed sedge/forb understory, shrub layer, and tree canopy, creating a the system with a variety of habitat niches. The ponds provides additional habitat diversity to the site. A variety of niches, in turn, can support a diversity of species. In fact, as many as 40 species of songbirds breed in forested swamps such as the flood plain of Poplar Plains Brook.

The proposed development is likely to result in a number of wetland impacts such as loss of wildlife habitat, disruption of high quality wetland areas, erosion and sedimentation, and increased runoff. There are, however a few positive attibutes of the

development plan. Most importantly, the developer, for the most part, has avoided encroaching into the highest quality wetlands on the site, which are in the flood plain. Filling activities within the udorthent wetlands are to be compensated through the excavation of new ponds and the enlargement of others.

Wildlife Resources

There are three major wildlife habitats found in the study area. They are: (1) inland wetlands; (2) upland mixed hardwood forest; and (3) disturbed habitat areas.

Large scale wildlife habitat management practices are not feasible for this site. The best approach in this situation would be to encourage residential wildlife habitat management improvement practices. Such activities include providing food, water, cover, and space.

LAND USE AND PLANNING CONSIDERATIONS

Surrounding Land Use

The land use surrounding the site is generally low density residential or vacant land. In addition to all environmental issues, the following issues should be considered: compatibility with surrounding land use and access to adjacent road systems.

Existing Road Network

The intersection with Newtown Turnpike is characterized by insufficient sight lines, especially to the south. Called Newtown Avenue in adjacent Norwalk, this road forms a radial north/south major road providing access to both Norwalk and the northwest corner of Westport to and from Exit 41 of the Merritt Parkway.

Were this site to be developed residentially, some traffic to and from Norwalk might be inclined to use Crawford Road (which runs eastward from Newtown Turnpike) and Lowlyn Road, a private road posted with "No Thru Traffic" signs, which connects Crawford Road with Partrick Road. Both intersections at either end of Lowlyn Road have bad sight lines.

Regional Plan of Development

The 1983 Regional Plan of Development urges the preservation of the extensive wetland areas on this site. The alternative residential design provided by the "Open Space Residential District" agrees with the 1983 Regional Plan recommendations regarding wider choice of housing types and the preservation of open space.

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INTRODUCTION

Introduction

The Westport Conservation Commission requested an environmental review on a site proposed for condominium development. The proposed development site is located in the northwest section of Westport, south of the Merritt Parkway, adjoining Partrick Road to the east and Newtown Turnpike and a parcel of town-owned land to the west. The remaining borders are adjoined by private properties. Access is provided via an unpaved road off of Newtown Turnpike (Figure 1).

The study area is approximately 56 acres in size consisting primarily of inland wetlands, flood plain, open woodland and upland forest communities. A number of naturally occurring ponds also occupy the site. The western portion of the site has been disturbed by past quarry activities. It is deeply excavated in places, forming dug ponds and an uneven topography. Soils in the center part of the quarry area are thin, and overlie schistose bedrock which outcrops in small ledges. This part of the site is overgrown by shrubs. Popular Plains Brook runs diagonally through the site in a northeasterly direction. The brook system is surrounded by black Adrian soils and supports a red maple wet forest. Finally, the proposed site is also underlain by a coarse-grained stratified drift aquifer.

Preliminary site plans indicated that 100, four bedroom condominium units are proposed for this site(Figure 2). In order to prepare the site for development, 22 acres out of a total of 40 acres of designated inland wetlands would be filled or altered. These wetlands serve as an extension of the Popular Plains Brook flood

plain. Several detention ponds would also be created in areas presently occupied as wetlands in order to increase habitat diversity and provide stormwater drainage. The development would be served by public water and public sanitary sewers are to be extended to the proposed site by the developer.

Goals and Objectives of the ERT

The primary goal of the ERT was to provide natural resource information and data on the proposed site, and determine the possible adverse environmental impacts, if any, of the proposed condominium development. The Town specifically asked the Team to: (1) assess the hydrogeological and soil characteristics of the proposed site; (2) inventory and assess the existing vegetative characteristics and wildlife habitat on the proposed site; (3) evaluate existing water supply and stormwater characteristics; (4) determine the potential recreational opportunities of the site; and (5) evaluate development limitations and opportunities of the proposed site.

The ERT Process

Through the efforts of the Westport Conservation Commission, the developer, and the King's Mark Environmental Review Team, this environmental review and report was conducted for the Town. This report is not designed or intended to compete with private consultants proposals or plans for this site. Rather, it provides a natural resource data base allowing the Town and the developer make informed decisions concerning the use of the proposed site.

The review process consisted of four phases: (1) inventory of

Figure 1

LOCATION OF STUDY SITE

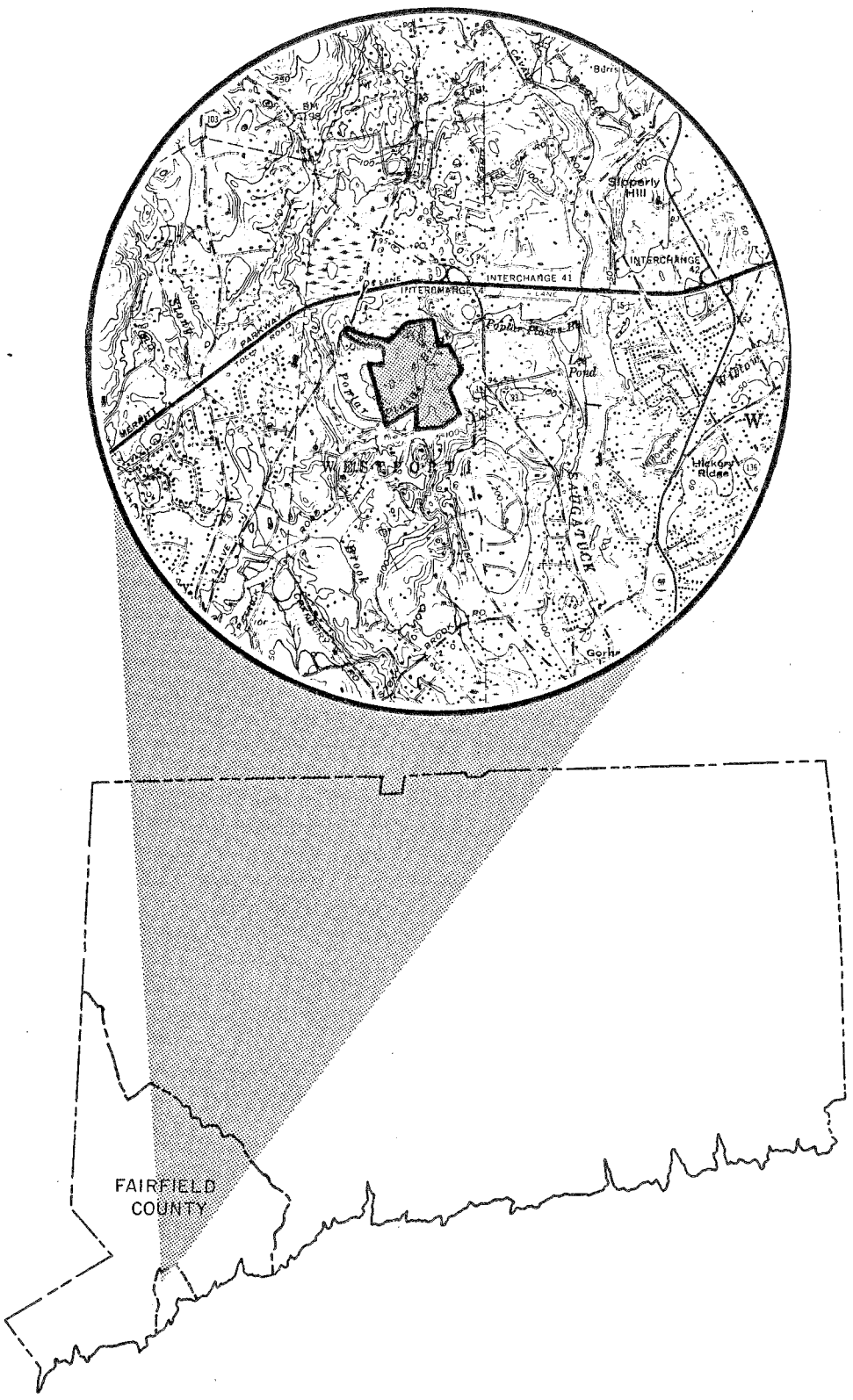
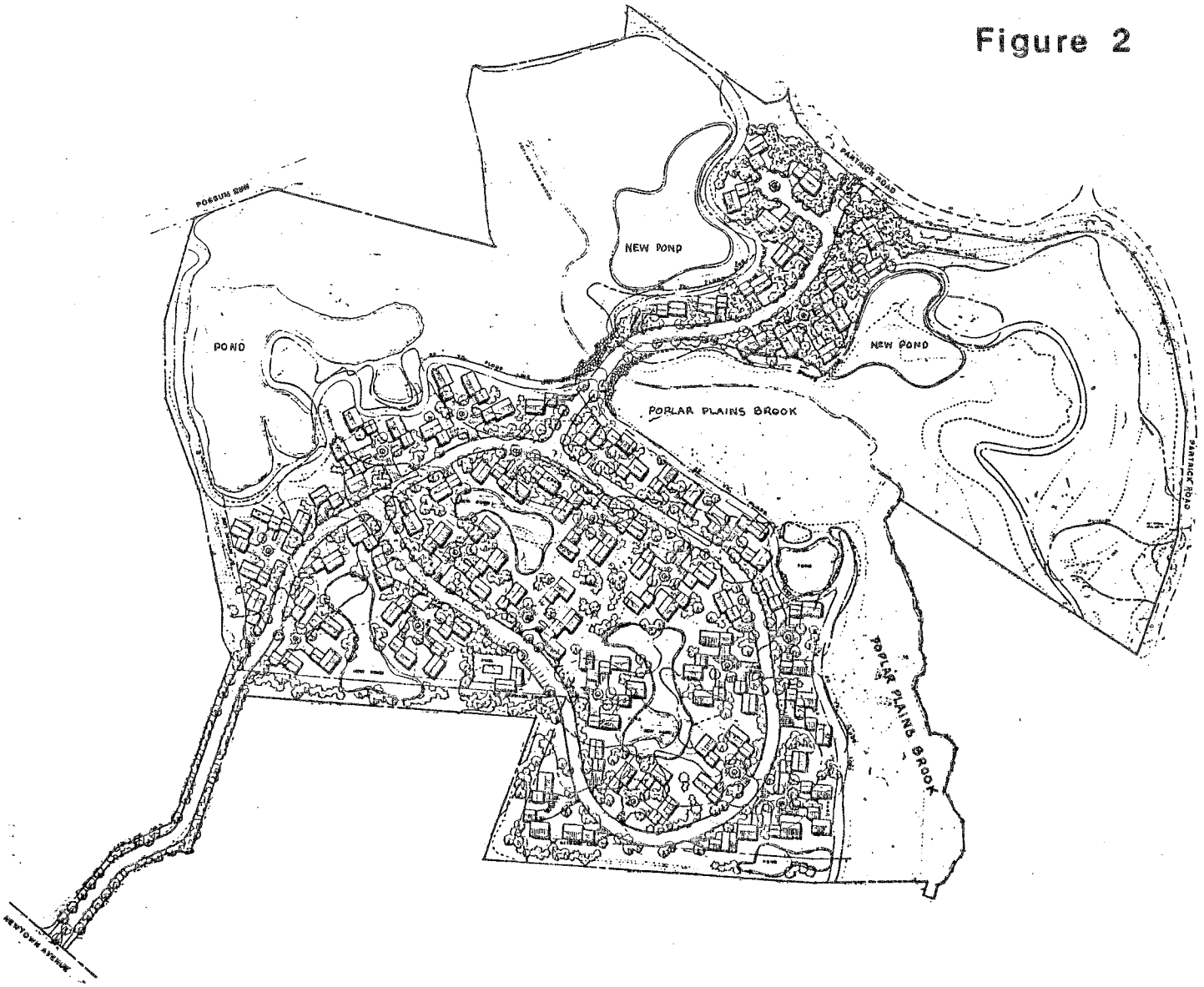


Figure 2



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CONCEPTUAL SITE PLAN

King's Mark Environmental Review Team

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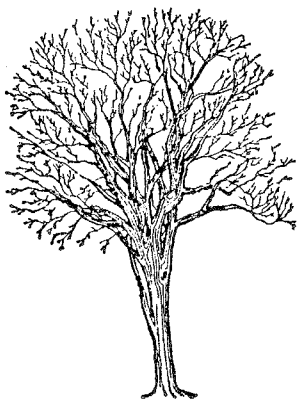
the study sites's natural resources (collection of data); (2) assessment of these resources (analysis of data); (3) identification of natural resource capabilities; and (4) presentation of planning and development guidelines.

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 most 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

Setting and Topography

The 56-acre site consists of an irregularly shaped parcel of land located about 1,000 feet south of the Merritt Parkway (Route 15). Access to the site at the present time is via a dirt road off Newtown Turnpike which abuts the property to the northwest. The site also has frontage on Possum Run to the north and along Partrick Road on the south and east.

Poplar Plains Brook, a tributary to the Saugatuck River traverses the eastern edge of the property in a northeasterly direction. Land use surrounding the property is predominantly medium density residential.

The parcel is the site of a former sand and gravel extraction operation/quarry. As a result of this activity, the land surface has been extensively altered throughout the western and central portions. Remains of the former mining operation are still visible on the site, including old processing equipment, open gravel pits, and several artificial ponds without outlet streams.

While the western and central portions of the parcel have a "moonscape" topography due to the former mining operation, land surface southeast of Poplar Plains Brook does not appear to have been disturbed by the former mining activity. This part of the property is characterized by a relatively long, Simons upland area protruding from Partrick Road into the inland wetland areas astride Poplar Plains Brook.

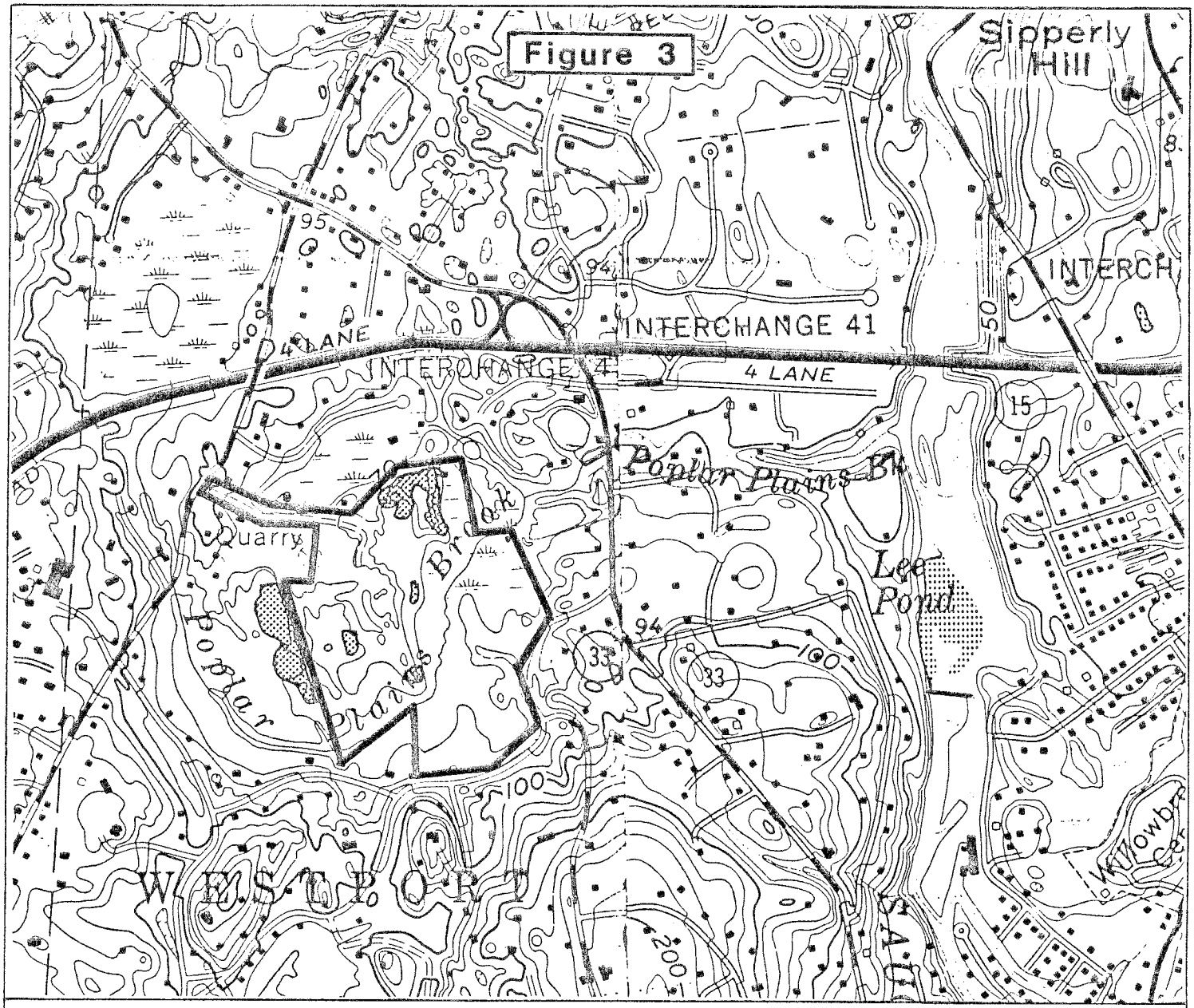
The highest point on the site is the top of a bedrock knoll in the central portions while the lowest points comprise the surface water levels of ponds and wetlands (Figure 3).

Development on the site is presently proposed in the disturbed areas in the western and central portions and on upland areas to the east. In order to develop the property, filling and grading will be required especially in the western and central parts.

Bedrock Geology

Ledgerock or bedrock is exposed at ground surface at the top of a small knoll in the central portions of the site. Ledgerock was most likely exposed as a result of the former mining operations on the parcel. Most of the bedrock underlying the site has been identified as a mixed felsic gneiss in a published Geological and Natural History Survey of Connecticut Report (QR-34) by Richard Kroll entitled The Bedrock Geology of the Norwalk North and Norwalk South Quadrangles (Figure 4). It should be pointed out that the site is encompassed by the Norwalk North Quadrangle. The rock is described as a medium grained, poorly to well-foliated gneiss that is gray in color. It is composed of the minerals quartz, feldspar, microcline, muscovite, and biotite. Minor minerals include opaques, chlorite, apatite, garnet, and zircon. Based on QR-34, these rocks do not outcrop on the site.

The ledgerock on the site grades into a medium and coarse grained, well-foliated, rusty, silvery, and blue-green rock called schist (see Figure 4). The mineral composition of this rock which is a subunit of the felsic gneiss mentioned above includes quartz,



WESTPORT CONDOMINIUMS

WESTPORT, CONNECTICUT

TOPOGRAPHY

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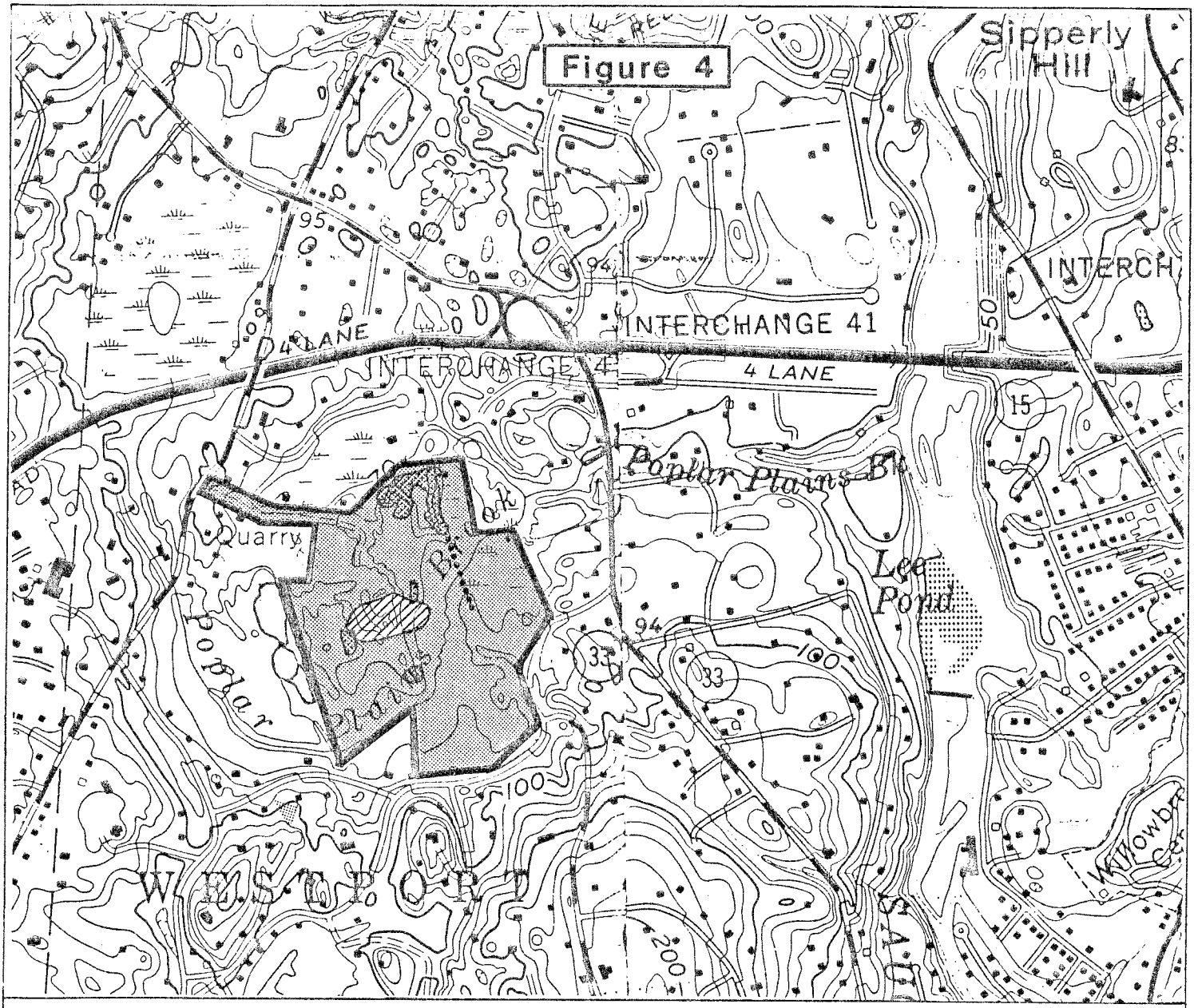

FELSIC GNEISS

SCHIST

AREAS WHERE BEDROCK IS AT OR CLOSE TO GROUND SURFACE

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WESTPORT, CONNECTICUT

BEDROCK GEOLOGY

King's Mark Environmental Review Team

0 1,000'

feldspar, muscovite, biotite, and microcline, with lesser amounts of opaque minerals, chlorite, apatite, garnet, zircon, sphene, and sillimanite. These rocks are well exposed in outcrops on top of the small knoll in the central parts.

Felsic gneisses and schists consist of intensely metamorphosed crystalline rocks, or rocks that have been geologically altered by great heat and pressure within the earth's crust. According to Kroll, the rocks are extremely old (i.e., probably Cambro-Ordivician geologic period, 440-570 million years old), and have a long and complex history. Their origin is either volcanic or sedimentary.

"Gneissic" rocks are commonly recognizable by distinct banding which occurs due to alternating layers of light granular minerals, and dark platy minerals. "Schistose" rocks have high percentages of flaky, platy, or elongated minerals, which are aligned to produce strongly layered (i.e., foliated) internal structure. The layering in the schist rocks outcropping in the central portions dips relatively shallow to the southeast. Depth to bedrock on the site ranges from zero in the central portions of the study area where it breaks ground surface to about 60 feet near Poplar Plains Brook.

Surficial Geology

The surficial geology of the Norwalk North topographic quadrangle has been mapped and described in U.S. Geological Survey Report MF-1520 by E. H. London.

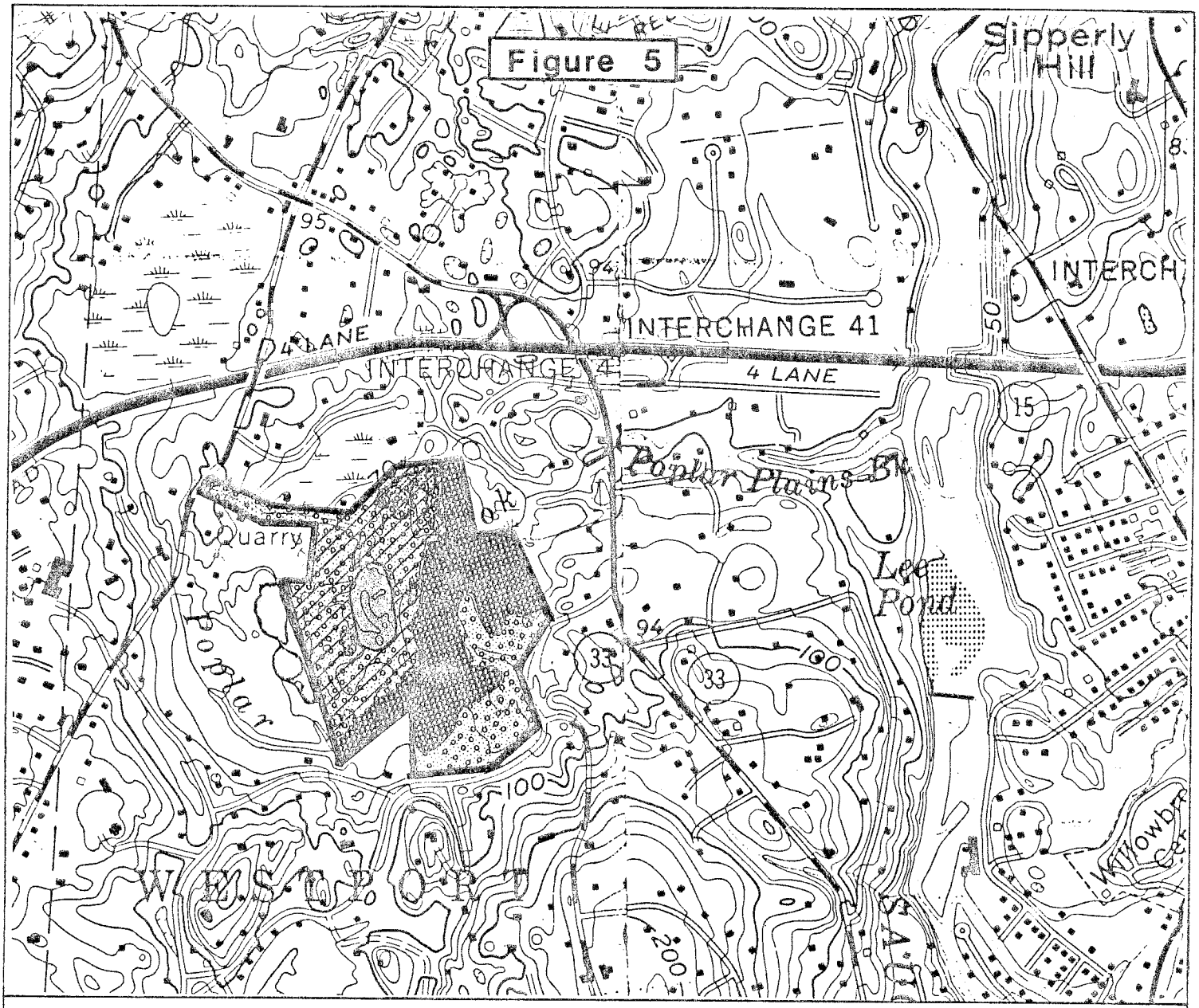
With the exception of the shallow to bedrock knoll in the central parts, the site is covered by a glacial sediment known as stratified drift (Figure 5). "Stratified drift" is a term given to sediments

that were deposited by glacial meltwater streams. These sediments were sorted by flowing waters emanating from glacial ice and were subsequently deposited in regular or irregular layers. The stratified drift on the site consists mostly of sand and gravel. The upland, tongue-shaped topographic feature in the eastern parts consists of sand with pebbles. Test holes in the vicinity of the property suggests that the thickness of the stratified drift on the site is between 10 feet or less and may be 60 feet near Poplar Plains Brook. As mentioned earlier, sand and gravel on the site had been mined over a 30 year period, beginning in 1930. The exact amount of surficial materials extracted from the site is unknown.

Another type of glacial sediment deposited found on the site is till (see Figure 5). A very thin layer of till covers the shallow to bedrock knoll in the central portions of the property. As the glacier flowed across the area in a northwest to southeast direction, it covered the rocky knoll in the central parts with a thin blanket of till, which was subsequently removed at or near the bedrock surface during mining activities on the site. Till consists of a non-sorted, non-stratified mixture of particles ranging in size from clay to boulders. These sediments were deposited directly by the ice sheet.

Overlying stratified drift deposits along Poplar Plains Brook are postglacial sediments called swamp deposits (see Figure 5). Swamp deposits consist of sand, silt, and clay mixed with organic material and deposited in poorly drained areas.

The permanent wetness in areas covered by swamp sediments conduct valuable ecologic and hydrologic functions such as flood storage,



STRATIFIED DRIFT (sand and gravel)

SHALLOW TILL

SWAMP DEPOSITS

AREAS WHERE THE FORMER MINING OPERATION ON THE PROPERTY CREATED SCATTERED INLAND WETLANDS

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WESTPORT, CONNECTICUT

SURFICIAL GEOLOGY

King's Mark Environmental Review Team

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be filled or modified in order to make the site suitable for construction of 100 condominium units. Of the 23 acres proposed for filling, 9.4 acres constitutes regulated inland wetland soils. The regulated soils proposed for filling appear to be those created by the former mining operation.

Prior to any decision concerning the filling of wetlands on the site, it is encouraged that the Town require the applicant to address all potential environmental impacts to the wetland as it exists at the present time from a hydrologic and ecologic standpoint. Special attention should focus on the ability of the wetlands areas to be filled to: (1) provide flood storage; (2) trap sediment; (3) clean inflowing water; and (4) provide habitat for wildlife. Also, consideration should be given to the effects of the proposed wetland fillings off-site. (See Hydrology Section for further discussion).

Because of the potential for erosion and siltation during construction phases, it is suggested that a conscientious erosion and sediment control plan be designed and followed very closely if the development proceeds. According to the Department of Environmental Protection (DEP) water quality classifications for the Southwest Coastal River Basin, which encompasses the site, Poplar Plains Brook is classified as Class A. "Class A" streams and water quality may be:

(1) suitable for drinking water supply and/or bathing;

(2) suitable for all other water uses; and

(3) character uniformly excellent, and possibly subject to absolute restrictions on the discharge of pollutants.

For these reasons, every effort should be made to protect Poplar Plains Brook from possible siltation during the construction period.

Geologic Development Concerns

Based on information supplied to Team members, the proposed 100 condominium units will be served by public water and sewer. The availability of these utilities to the site should help decrease the likelihood of groundwater contamination, particularly in view of the permeable sands and gravel covering the site.

The principal geologic limitations with regard to the proposed development include the following:

(1) the presence of shallow to bedrock area in the central parts, which will require some blasting;

(2) the "moonscape" topography in the western and central parts, which will require extensive improvements in order to make it suitable for development;

(3) the presence of regulated inland wetland soils, some of which are proposed to be filled.

There appears to be a chance that blasting will be necessary, whether for construction of buildings or for creation of trenches for the public water and sewer lines. It is extremely difficult to evaluate the risks from blasting in any area. Special attention will need to focus on the effects of blasting on: (1) increased erosion in the immediate area, particularly in moderately sloping areas; (2) bedrock wells serving neighboring homes to the project, and (3) foundations of nearby homes.

The Team's geologist generally concurs with recommendations regarding blasting made in the report entitled Hydrogeologic Impact Assessment of Proposed Condominium Development, School Associates

Property, Westport, Connecticut prepared by Leggette, Brashears and Graham, Inc.

It is encouraged that the applicant adhere to all of the recommendations made in the aforementioned report to avoid any possible problems. It seems that nearby bedrock wells could experience changes in yields from blasting, but the probability that the yield would increase, seems at least as good as the possibility of a decrease. Blasting may also result in increased turbidity levels at least initially, if proper precautions are not taken.

Site preparation of the parcel for development will be extensive and costly. Adequate amounts of fill will be necessary in order to place building foundations, roads, or utility lines. The applicant's representative mentioned on the review day that much of the fill material will be taken from excavated ponds in the site. Although no figures were discussed as to the amount of fill material, it seems likely that additional fill will need to be trucked to the site. As mentioned earlier, a detailed erosion and sediment control plan will need to be formulated and followed closely with implementation of all fillings.

Hydrology

The entire site lies within Poplar Plains Brook watershed (Figure 6). Land use in the Poplar Plains Brook watershed is characterized by medium to high density residential. Route 15 (Merritt Parkway) bisects the watershed in an east/west direction. A moderate sized wetland on the northside of Route 15 and the subject parcel appears to be the only undeveloped parts of the watershed.

APPROXIMATE STUDY AREA

POPLAR PLAINS BROOK WATERSHED AND ITS RESPECTIVE POINT OF OUTFLOW ON SAUGATUCK RIVER

STREAMCOURSE

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WESTPORT, CONNECTICUT

WATERSHED BOUNDARY

King's Mark Environmental Review Team

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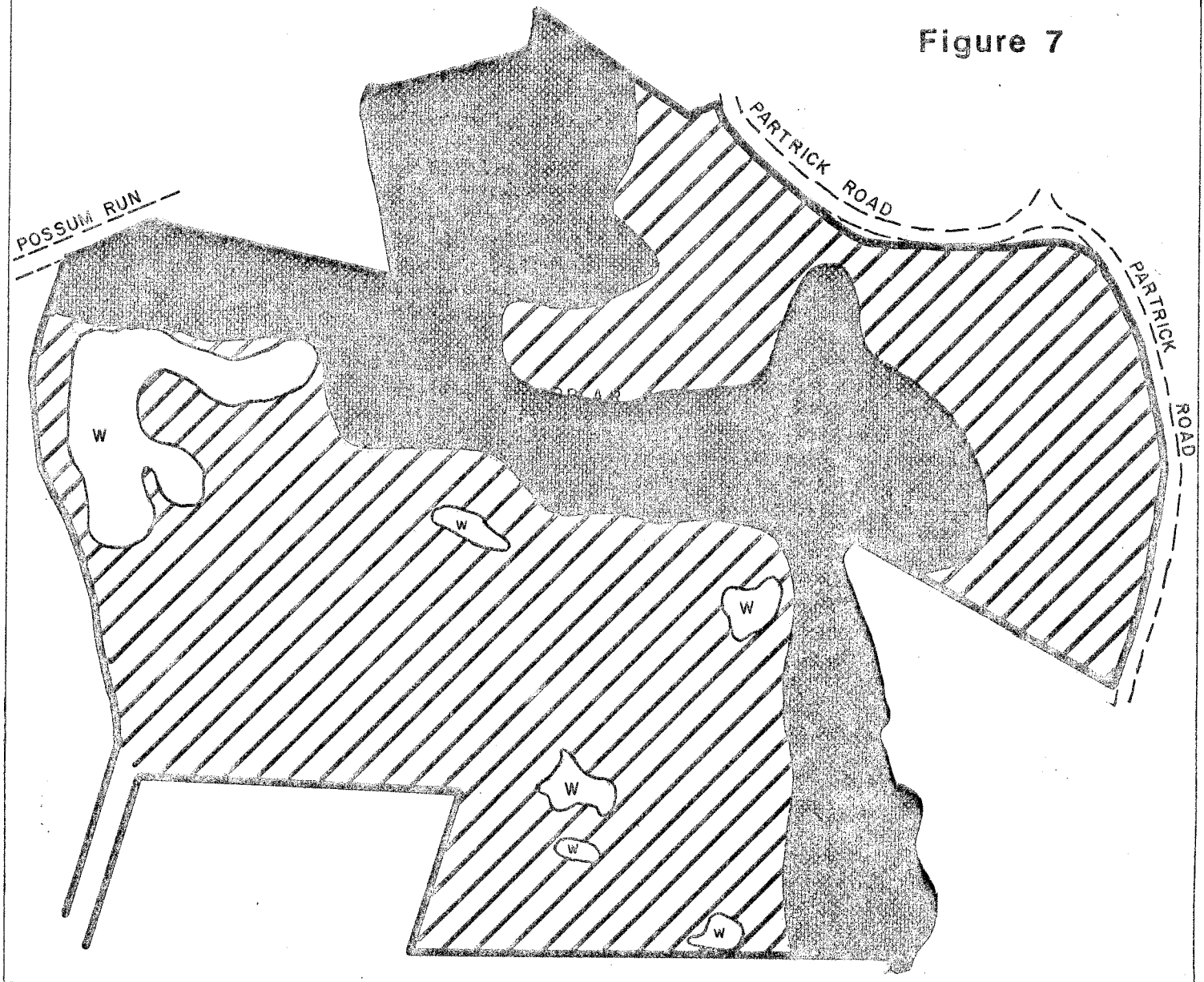
map by Daniel B. Meade, the entire site is underlain by deposits known or inferred to be capable of yielding moderate to very large amounts of water (50 to 2,000 gallons per minute). Sand and gravel sediments, by nature, tend to transmit water very rapidly, particularly coarse sediments (Figure 7).

Depending upon town and/or regional public water supply needs, it may be worthwhile to drill a few exploratory wells to assess the aquifer potential of the sand and gravel deposits on the site. The exploratory study should also include analyzing water samples for quality, especially in view of the former landfill site nearby.

Based on the DEP publication entitled Water Quality Standards and Criteria for the Southwest Coast River Basin, groundwater beneath the site is classified as GA. A "GA" classification means the groundwater may be suitable for public or private drinking water use without treatment. If a highly productive zone is found in the deposit, the Town may want to reconsider the ultimate use of property and ways to protect it from possible contamination. As mentioned earlier, a public sewer line will be made available to the area thereby reducing the risk of substantial groundwater pollution from subsurface discharge emanating from on-site sewage disposal system(s).

Development of the site for 100 condominium units can be expected to lead to increases in stormwater runoff. The amount of increased runoff will depend largely on the density and extent of development on the property, amount of impervious surfaces created, and the timing of development. The two biggest problems associated with increased runoff is the potential for: (1) flooding; and (2) stream bank erosion.

Figure 7



STRATIFIED DRIFT

SWAMP DEPOSITS

WESTPORT CONDOMINIUMS

WESTPORT, CONNECTICUT

AQUIFER

King's Mark Environmental Review Team

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In order to prevent flooding problems from arising, the Town has regulations which require postdevelopment runoff conditions be maintained at present level. A likely resolution for this requirement will be the construction of stormwater detention ponds. In fact, the applicant's representative has indicated on the grading plan for fill permit that several existing ponds would be enlarged and at least two new ponds would be created. It appears that the enlarged or newly created ponds would have outlet streams. Based on discussions with the applicant's representative, these ponds would be created for runoff/storage function as well as for aesthetics. It might be wise to combine the runoff/storage function with a sediment/retention function. If sediment does accumulate in the pond(s), it will have to be removed periodically in order to assure that the runoff/storage capacity of the pond is not diminished.

It is encouraged that a detailed engineering study, which includes pre- and postdevelopment data as well as a careful stormwater management plan be developed and implemented prior to any construction or site preparation. These plans should also include detailed information on the proposed detention basins. A careful look at all downstream culverts is also suggested

It appears that most of the proposed detention basins would be located within limits of inland wetlands on the site. According to the Flood Insurance Rate Map for Westport prepared by the Federal Emergency Management Agency, the subject parcel is located in an area of minimal flooding. Nevertheless, it seems likely that the inland wetlands on the site have at least some intrinsic capacity for stormwater retention. For this reason, consideration should be given

to locating the retention basins on upland soils. This will minimize wetland impacts while providing the desired pond retention system. However, it would probably lead to a reduction in the number of condominium units.

A major concern is the close proximity of buildings to several ponds on the site. The applicant should assure that problematic backup in these areas would not occur as a result of culvert sizing and/or ponds constructed without outlets. It should be pointed out that the excavation of the pond near the rocky knoll in the central parts may be hindered by the proximity of bedrock to the surface.

Based on the grading plan for fill permit submitted to Team members, the applicant wishes to span a more or less 130 foot section of Poplar Plains Brook and its accompanying flood plain. This crossing would connect developed areas in the eastern parts with the developed areas on the western and central portions. It appears that these wetlands will be the only naturally occurring wetlands disturbed on the parcel.

Although undesirable, wetland road crossings are feasible, provided they are properly engineered. When crossing wetland or flood plain soils with roads or driveways, provisions should be made for removing unstable material beneath the roadbed, backfilling with a permeable road base fill material, and installing culverts as necessary. It appears that the wetland soils to be crossed contains an organic layer.

The road should be properly placed above the surface elevation of wetlands. This will allow for better drainage of the roads and it will also decrease the frost heaving potential of the road. Road

construction through wetlands should preferably be done during the dry time of the year and should include provisions for effective erosion and sediment control. It is particularly important that the culvert be properly sized and located so as not to alter the water levels in the wetland or Poplar Plains Brook. In this regard, the project engineer will need to take a close look at the surface hydrology in the wetland area.

Town officials questioned on the review day the effectiveness of the proposed ponds, most of which will be located on wetland soils, as opposed to existing wetlands, in reducing flood flows. Because knowledge in the area of this specific hydrologic function is too little to allow a definite answer, the question is a very difficult one to address. In most cases, watersheds are evaluated for flood capabilities by adding total swampy and ponding areas; these two deficient systems are not distinguished. This suggests that the two are approximately equally effective for reducing flood flows. Nevertheless, to the extent that rainfall onto the wetland may percolate through the hummocks of "land" above the water table, while rainfall onto the pond would reach the surface instantly, a certain additional retentive ability (i.e., a "sponge" effect) may exist in the swamp. This, of course, would be partly offset by the volume of potential storage space that the "land" itself occupies. Another factor to consider is the extent to which the swamp vegetation and microtopography itself slows surface flow rates, thereby reducing the potential for stream bank erosion downstream. This factor would, in turn, depend upon the existing water or ice level at the time of the flood-causing storm event or snowmelt; the lower the water, the

greater the slowing effect of the wetland on surface flows. In conclusion, it seems likely that the differences between the two would be relatively small. The applicant should be required to demonstrate that no hydrologic problems would result on or off-site regarding this matter.

A final concern related to the proposed project is the presence of the former municipal landfill site near the northwest corner. As mentioned earlier, the applicant had an engineering study conducted relative to the landfill. According to IPC's, Inc. report (June 1985), it appears that the leachate plume emanating from the landfill is posing no significant impact on the overall site, providing on-site wells are not utilized. If on-site wells were utilized, a more detailed study which include test wells and sampling for water quality would be necessary.

A potential concern which was not addressed in the IPC report, is the potential for landfill decomposition gas migration from the former landfill site once buildings have been established. Perhaps consideration should be given to determine the possibility of gas (i.e., methane) migration towards the site.

Soil Characteristics

Introduction

The soils map and narrative are a revision of materials contained in the Soil Survey of Fairfield County, Connecticut. The symbols on the map identify map units. Each map unit has a unique combination of soils. Areas with the same symbol have the same composition.

Inland Wetland Soils

Palms Soils (Aa)

This map unit is composed primarily of Palms soils on 0 to 3 percent slopes. Palms soils are very deep and very poorly drained. Typically, they have an organic surface layer 16 to 51 inches thick overlying loamy materials to a depth of 60 inches or more. The water table is at or near the soil surface for the majority of the year. These soils are inland wetlands (Figure 8).

The organic materials have very poor bearing strength. These materials will have to be removed before any structures or roads can be built in this area. Organic materials removed from the site will shrink in volume as they dry. This makes the organic matter unsuitable as fill material.

The Palms soils help store flood waters during large runoff events. Extensive filling of this area may aggravate any existing downstream flooding problems.

Non-Inland Wetland Soils

Hinckley Soils (HkC)

This map unit is composed primarily of Hinckley soils on 3 to 15 percent slopes. Hinckley soils are very deep and excessively drained. Depth to the water table is greater than 6 feet. Hinckley soils have stratified sand and gravel to a depth of 60 inches or more (see Figure 8).

The Hinckley soils should not present any construction difficulties during site development. It should be noted that cutbanks of excavations will be unstable and will cave-in due to the soil's sandy and gravelly textures.

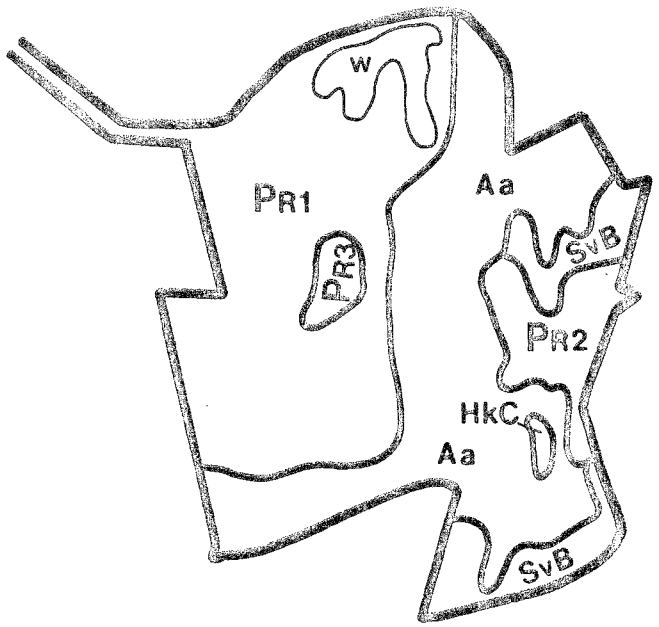
Borrow Pit (Prl)

This map unit is a former borrow pit. Up to 20 feet of soil material has been removed.

Many of the excavations are deeper than the water table level and have formed small ponds. Much of the remaining area has a high water table within three feet of the soil surface. The soils generally are 60 inches or more deep. There are many piles of bulldozed materials on the site leaving a very irregular topography. The bulldozed mounds are 3 to 8 feet high and have short, steep slopes. Slopes are dominantly 3 to 15 percent but range up to 45 percent on escarpments and mound slopes.

Surface drainage trenches are already located throughout the site. There is no drainage outlet for subsurface drainage. For this reason, development of this area will require fill in order to get

Figure 8



PR1	Borrow area, deep soils, many areas of Inland Wetlands
PR2	Borrow area, deep soils, few areas of Inland Wetlands
PR3	Borrow area, shallow soils and rock outcrops
SvB	Sutton soils, deep, moderately well drained, high water table: 1.5 - 3.0'
Aa	Palms soils, 16 - 51" of organic material over loamy material, high water table at or near the surface for most of year
HkC	Hinkley soils, very deep, excessively drained
W	Water

WESTPORT CONDOMINIUMS

WESTPORT, CONNECTICUT

DISTRIBUTION OF SOILS

King's Mark Environmental Review Team

above the water table.

Much of this area is inland wetlands. The man-made ponds qualify as watercourses. There are also many locations where the seasonally high water table is within 20 inches of the soil surface. These soils generally do not show mottling and gleying typical of wetland areas because the site has been disturbed. However, these soils technically are wetlands because they have an aquic moisture regime. An aquic regime is one in which oxygen is not present in the soil pores or dissolved in the soil water.

Borrow Pit (Pr2)

This map unit is also a former borrow area. It differs from Pr1 in that most of the site does not have a high water table. The soils are generally greater than 60 inches deep. Small areas of undisturbed soil are also included in this map unit. These soils are fine sandy loam throughout their depth. Very little of this site would be considered inland wetlands.

Development of this area will require extensive and costly earth moving in order to smooth the irregular and steep slopes.

Borrow Pit (Pr3)

This map unit is a former borrow area composed of shallow soils and rock outcrops. The soils are less than 20 inches deep over bedrock. Slopes range from 3 to 40 percent. Any cuts into this material will require blasting.

Sutton Soils (SvB)

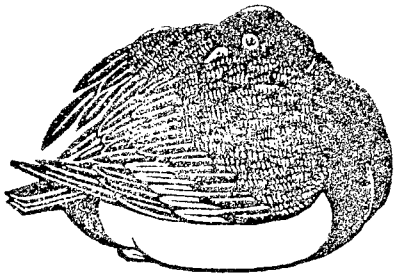
This map unit is composed primarily of Sutton soils on 2 to 6 percent slopes. These soils are very deep and moderately well drained. Typically, they have fine, sandy loam textures to a depth of 60 inches or more. Sutton soils have a seasonally high water table that ranges in depth between 1.5 and 3.0 feet from November through April.

This Sutton map unit is transitional in nature. Generally, better drained soils border Partrick Lane. These soils have a water table below three feet.

Toward the interior of the property the Sutton soils give way to poorly drained sites with a water table within 1.5 feet of the soil surface. The boundaries between these three kinds of soils are not designated on the map since the Sutton soils dominate the site.

Depth to the high water table will be the major problem on these soils.

BIOLOGICAL RESOURCES



BIOLOGICAL ATTRIBUTES

Introduction

Weeds in Winter by Lauren Brown, Newcomb's Wildflower Guide by Lawrence Newcomb and the Audubon Society Field Guide to North American Wildflowers were used to identify herbaceous species and some of the shrubs. John C. Cooke's Common Mushrooms of New England was used for mushroom identification. Woody species were keyed out with the Illustrated Guide to Trees and Shrubs by Arthur Harmount Graves. Bird species were identified in Peterson's Field Guide to the Birds. Wetlands, an Audubon Society publication by William A. Niering, was helpful in the area of fish and amphibians.

Description of Wetland Vegetation

The site of the proposed Westport Condominium development consists of 56 acres. Of the total acreage, 34.48 acres, or 62 percent are wetlands. An estimated 23 acres of these wetlands are located within the flood plain of Poplar Plains Brook. An additional 8.53 acres of wetlands are underlain by aquic udorthents (soils which have been altered by man's activities). A series of ponds interspersed throughout the western half of the site account for the remaining 2.95 wetlands acreage.

Poplar Plains Brook flows in a northeasterly direction. A red maple swamp has developed in the flood plain associated with the brook (Figure 9). Although dominated by red maple, the tree canopy in the flood plain is also occupied by ashes and black birch. Spicebush, viburnums, sweet pepperbush, winterberry, and highbush blueberry are found in the shrub layer. The understory is cushioned with tussock sedge hummocks. Skunk cabbage, false hellebore,

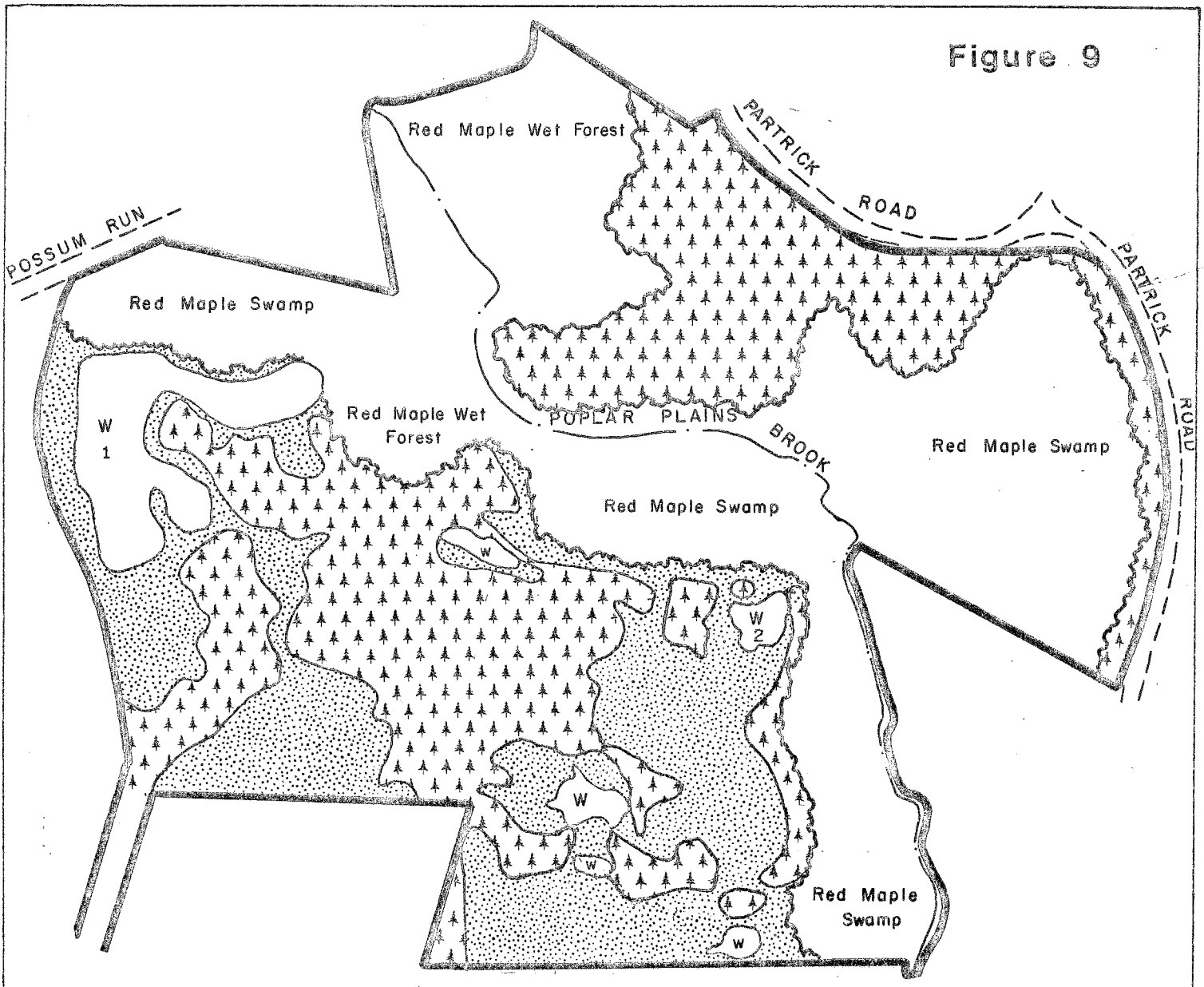
cinnamon fern, and sensitive fern grow on and among the hummocks.

The udorthent-based wetlands in the west portion of the site are distinctly different than the flood plain swamp (see Figure 9). These scrub/shrub wetlands are dominated by deciduous shrubs, including speckled alder, pussy willow, Russian olive, highbush blueberry, sweet pepperbush, silky dogwood and bayberry. Shadblow and clammy azalea are occasional. Although lacking a developed tree canopy, the scrub/shrub swamp also supports cottonwood, quaking aspen, red maple, black birch and grey birch. Black tupelo and weeping willow were also observed. Cranberry was observed growing in a depression on the north side of an east-west running ridge at the south end of the site.

Shallow ponds and borrow pits occur throughout the western portion of the site. Since the pond edges have steep slopes, the marsh fringes one tends to associate with such ponds have not developed. Bladderwort and water milfoil were observed in the ponds, as were mallards, shiners (Notropis cornutus) and painted turtles (Chrysemys picta). In the pond labelled as number "2" in Figure 9, spatterdock (listed as yellow pond lily by the developer) was noted. Common reed, common cattail, and iris were found growing in the pond margins with occasional sensitive ferns. The most outstanding feature of the pond margins, however, was that they were ringed with shrubs and small trees. Bayberry, speckled alder, pussy willow, Russian olive, silky dogwood, sweet pepperbush, and highbush blueberry overhang the water surface.

Perhaps the most noteworthy of the ponds is the one labelled number "1" in Figure 9. Roughly 1.9 acres in extent,

Figure 9



UDORTHENT WETLAND (Shrubs, trees, herbaceous species)

UPLAND FOREST

RED MAPLE SWAMP/ RED MAPLE WET FOREST (Natural Wetland)

W WATER

WESTPORT CONDOMINIUMS

WESTPORT, CONNECTICUT

VEGETATION PATTERNS

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0 295'

it is the largest pond on the site. Its sinuous configuration, patches of cattails and reeds, and close proximity to the shrub and red maple swamps offer waterfowl, songbirds, and small mammals a variety of niches.

Uplands on the west side of the site support a variety of mesic and xeric species, such as red cedar, white pine, black locust, American beech, wild black cherry, and a variety of oaks (see Figure 9). Ornamental crabapples were also observed. Displaying its wide ecological tolerance range, red maple continued to dominate the tree canopy. Red maple also dominates the forest along Partrick Road and joined by oaks and eastern hemlocks.

Numerous migratory and resident songbirds were noted, including American crow, black-capped chickadee, tufted titmouse, northern cardinal, house sparrow, and American robin. Two species of warblers were observed, common yellowthroat and yellow warbler. The mimic thrushes were represented by gray catbird and brown thrasher. Red-winged blackbirds were paticularly numerous. Mallards were seen flying overhead and feeding in the ponds.

Insects were also numerous and included waterskimmers, dragonflies, spiders, and ticks. Other wildlife signs included deer prints, and droppings which may once have belonged to a raccoon. Tadpoles were observed in a depression along one of the paths. No rare or endangered species were observed.

The wetland's significance is partly attributable to its size, since development pressure throughout Connecticut has made higher acreage flood plain swamps something of a rare find. Within the

flood plain, the wetlands are relatively undisturbed and have a well developed sedge/forb understory, shrub layer, and tree canopy, creating a the system with a variety of habitat niches. The ponds provides additional habitat diversity to the site. A variety of niches, in turn, can support a diversity of species. In fact, as many as 40 species of songbirds breed in forested swamps such as the flood plain of Poplar Plains Brook.

A combination of factors contributes to the site's value for waterfowl and songbirds. Open water at the pond sites provides drinking water, and the presence of such berry-producing shrubs as highbush blueberry, silky dogwood, common blackberry, and viburnums provide a food source for songbirds. Ducks are able to feed on rooted and floating aquatic vegetation, like the duckweed and water milfoil. During the early spring, female ducks prepare for the breeding season by utilizing insects as a protein source. It is likely that the flood plain is as important for insect production as are the ponds. The insect population serves as an important food source for songbirds as well. Important for the warblers are the willows and poplars, which provide necessary nesting material. The red-winged blackbirds build their nests by weaving them directly into reeds (i.e., phragmites and cattails).

The alders found throughout the scrub/shrub swamp do more than provide forage and habitat for birds and small mammals. Alders carry on a symbiotic relationship in their root systems with nitrogen-fixing bacteria. In the nodules of alder roots, atmospheric nitrogen is converted to a form which can be utilized by the plants in the swamp and then passed along the food chain. The swamp has its

own fertilizer in the alder thicket.

The site has extensive forage material for deer, and the forest provides some buffer area between the wetlands and surrounding residential areas. Other wildlife can benefit from the diverse vegetative community, ample insect supply, and the panfish community found in the ponds.

Anticipated Impacts

Plans provided to the Environmental Review Team showed that the proposed 100-unit condominium development would entail several types of wetland involvement. Three ponds within the udorthent area will be filled. Two ponds in the western portion of the site will be enlarged, and two new ponds will be created in the udorthent and upland area. Two additional ponds are to be excavated within the flood plain. The two ponds numbered in Figure 9 are to remain essentially unaltered. A road is to be constructed across the flood plain and Poplar Plains Brook to connect development on the east portion of the site with the areas to the west of the brook. Fill would be placed in approximately 22.7 acres of wetlands. (The applicant's report to the Conservation Commission stated that, while 22.7 acres of wetlands would be filled, only "...9.4 acres of regulated area are involved." The understatement of the regulated wetland acreage is apparently based on a misunderstanding concerning aquic udorthents. Many areas which were filled prior to the passage of the Inland Wetlands and Watercourses Act are not regulated as inland wetlands. However, where fill areas remain under an aquic regime, i.e., if aquic udorthents are present, the area is regulated

as an inland wetland). The proposed activities are likely to result in the following impacts:

(1) The roadway crossing through the flood plain would significantly disrupt the wildlife corridor currently associated with the brook and flood plain and would adversely affect high quality wetland areas;

(2) Depending on the placement, configuration and sizing of culverts in the roadway crossing, flow patterns through the flood plain could be altered. Changes in the hydrologic regime could result in unwanted changes in the composition and quality of the vegetation community;

(3) The proposed development would virtually eliminate existing buffers between the flood plain and surrounding residential areas;

(4) Some of the ponds which currently support panfisheries and waterfowl would be eliminated;

(5) The scrub/shrub swamp which currently supports songbirds, deer, and small mammals would be eliminated;

(6) Filling activities could result in sedimentation and erosion problems;

(7) Pond excavation activities in the flood plain are likely to release a large volume of sediments into the water column. Additional concerns related to excavating the proposed ponds in the flood plain are the problems of dewatering and spoil disposal;

(8) Since the applicant's plans do not show the extent of the 100-year floodway, it is difficult to assess the safety of the development during a low-frequency storm. Since the plans show development extending up to the 25-year floodway, it is easy to assume that roadways and homes will be located in the 100-year floodway. Not only is there the danger of property damage, evacuation routes could be flooded out if the access roads are constructed below the 100-year flood elevation; and

(9) Runoff from roadway surfaces could introduce oil, grease, and silt into the watercourse.

The applicant had asked whether the proposed development would destroy or adversely affect any valuable wetlands. The short answer to this question is "yes." Of particular concern are the activities proposed for the flood plain which are to include two ponds and a roadway crossing. The wetland quality is such that filling should be limited to the minimum amount necessary, and if it is possible to develop the site without crossing the wetlands, impacts could be substantially reduced.

There is an old saying that goes, "If it ain't broken, don't fix it." The flood plain wetlands are far from broken and certainly do not require fixing. The two ponds slotted for excavation in the flood plain have been supported in the developer's documents in terms of improving habitat diversity. There are already ponds on-site, however, and the two ponds which the developer has planned not to disturb are in close proximity to the flood plain. These ponds are not isolated entities. Together with the red maple swamp, they provide wildlife habitat. Excavating additional ponds within the flood plain is not necessary.

A final point concerning wetland impacts is that, by developing right to the edge of the flood plain from both sides, all buffer areas will be eliminated. Of particular concern to prospective residents will be the flood hazards associated with low-frequency storms.

There are a few positive points to be made in favor of the development plan, however. Most importantly, the developer, for the most part, has avoided encroaching into the highest quality wetlands on the site, which are in the flood plain. Filling activities within

the udorthent wetlands are to be compensated through the excavation of new ponds and the enlargement of others.

Alternatives

There are several alternatives to the proposed development which would have fewer adverse impacts than the plan provided to the Environmental Review Team, including:

(1) Developing the site without crossing the flood plain. There could then be two discrete development areas on the site, one on the west side with access from Newtown Avenue, and the other on the east side with access from Partrick Road;

(2) Limiting development only to the west side of the site, which would eliminate the flood plain crossing and would preserve some buffer areas on the east side of the site;

(3) Constructing smaller units;

(4) Constructing clustered or attached units; and

(5) The "no-build" alternative.

Mitigating Measures

Any development plan for this site should be designed with wetland conservation and flood protection in mind. Encroachments into the red maple swamp in the flood plain should be avoided. To ensure that the site will be aesthetically pleasing while still able to support waterfowl, some ponds should be provided. Measures which would mitigate the adverse impacts of the development proposal include:

(1) If structures are permitted within the 100-year floodway, then first floor elevations should be at or above the 100-year flood elevation;

(2) Cuts and fills should be balanced within the 100-year floodway;

(3) At a minimum, structures and fill should encroach no further into the floodway than those shown on the plans;

(4) Plans should provide dry evacuation routes during low frequency storms;

(5) A vegetated buffer of at least 25 feet should be maintained between the flood plain and the proposed condominiums;

(6) Erosion checks should be placed at proposed toes of slope to prevent entry of sediments into wetlands or watercourses;

(7) It is suggested that fill slopes be no steeper than 1:1. Embankments should be immediately seeded and mulched to prevent erosion, and staked haybales or silt fencing should be maintained until grass plantings have begun to stabilize slopes;

(8) If sedimentation or detention basins are necessary, they should be located outside of the flood plain;

(9) Before undertaking any pond excavation activities, soil borings should be studied to ensure that the subsoil is impermeable enough to sustain a pond;

(10) The new ponds and pond enlargements should be designed to attract waterfowl and songbirds. The ponds need only be five feet deep or so, and should have gentle side slopes of about 4:1 to ensure stability and to enable emergent vegetation, floating aquatics and rooted aquatics to become established in the shallows at the pond margins. It is this vegetation which will attract and support waterfowl. A "shelf" should be designed in the basin perimeter, where water depths would be no greater than one foot. The shelf should be planted with such moisture-loving plants as cattails, Italian rye, water millet, wild rice, wild celery, arrowhead, common bullrush, and cardinal flower to provide nesting and forage material for ducks, shiners and songbirds. An appropriate planting of berry-producing wetland shrubs should be planted landward of the marsh fringe to support songbirds. Such a planting could include bayberries, arborvitae, highbush blueberry, virburnums, and silky dogwood;

(11) Natural vegetation should be allowed to remain in the flood plain to minimize impacts to wildlife;

(12) To further minimize wildlife impacts, foundation and buffer plantings should employ shrubs and trees with high wildlife value. A combination of deciduous and evergreen varieties should be employed. Deciduous shrubs and trees provide nesting materials and food, while evergreens provide cover during winter months. Plantings might include Japanese yew, Chinese juniper, and red cedar. Berry-producing species are essential and might include hawthorns, dogwood, cherry, highbush blueberry, bayberry, and virburnums.

(13) Catch basins should be hooded to minimize the entry of oil and grease into wetlands and watercourses.

Wildlife Habitat Types

Wetlands

The wetland wildlife habitat is dominated by a red maple swamp consisting of red maple, black birch, yellow birch, oak and ash. Understory vegetation contains typical wetland species such as pussy willow, silky dogwood, pepperbush, spicebush, red maple, sensitive fern, skunk cabbage, sedges, club moss, and various ferns and other herbaceous species.

Other wetland wildlife habitat includes several existing ponds and a stream corridor along Poplar Plains Brook. Overstory composition is cottonwood, red maple, birch and willow. Understory vegetation is comprised of dogwood, willows, alder, cattail, sedges, rush, and other typical herbaceous species.

Wildlife species utilizing such habitat is quite diverse including woodpeckers (i.e., downy, hairy, pileated, red-bellied), striped skunk, raccoon, white-tailed deer, mink, red fox, American woodcock, beaver, muskrat, waterfowl (i.e., wood duck, mallard, black duck, Canada geese), herons (i.e., great blue, green), passerines, and numerous amphibians and reptiles.

Upland Mixed Hardwood Forest

This wildlife habitat type consists of a variety of hardwood species including sugar maple, red maple, black birch, beech, ash, oak and cherry. There are some scattered conifers such as white pine, hemlock and cedar. Understory species include barberry, dogwood, spicebush, raspberry, mountain laurel, greenbriar,

blueberry, and hardwood seedling/saplings.

Wildlife typically frequenting such sites are ruffed grouse, gray squirrels, flying squirrels, white-tailed deer, owls (i.e., great horned owl, screech owl), woodpeckers, various passerines, and a great variety of other nongame species (i.e., shrews, chipmunks, moles, white-footed mouse).

Disturbed Habitat Areas

Due to extensive quarry activities of the past a large portion of the study area has been disturbed. Wildlife habitat is comprised of dense shrubs such as sumac, rose, dogwood, cedar, birch, red maple, autumn olive and willows; rocky outcrops; larger trees such as cottonwood, aspen, birch and red maple; excavated ponds which were discussed under wetlands; and small openings of herbaceous vegetation. Vines present are bittersweet, greenbriar and grape.

Wildlife utilizing such habitat include white-tailed deer, ring-necked pheasant, American woodcock, eastern cottontail, various small nongame mammals, and numerous birds. The greatest wildlife use within this type appears to be as a bird nesting site. Probable species nesting and/or feeding within the disturbed habitat or the ecotone from the disturbed area to red maple swamp include orchard oriole, northern oriole, red-winged blackbird, yellow warbler, yellowthroat, warbling vireo, yellow-throated vireo, red-eyed vireo, eastern kingbird, great crested flycatcher, willow flycatcher, American robin, brown thrasher, bluejay, American crow, black-capped chickadee, white-brested nuthatch, tufted titmouse, house wren, mockingbird, gray catbird, rose-breasted grosbeak, northern cardinal,

starling, cedar waxwing, eastern bluebird, wood thrush, veery, indigo bunting, blue-winged warbler, American goldfinch, rufus-sided towhee, chipping sparrow, green heron, wood duck, red-shouldered hawk, broad-winged hawk, ringed-necked pheasant, mourning dove, yellow-billed cuckoo, screech owl, flicker, pileated woodpecker, red-bellied woodpecker, hairy and downy woodpeckers, and northern parula warbler (Refer to Audubon Society Breeding Bird Atlas).

Discussion

Since Connecticut is a densely populated and growing state, available habitat continues to decline. It is therefore prudent to consider maintaining and enhancing existing wildlife habitat. The following practices may help to improve conditions within the various wildlife habitat types.

Forestland Guidelines

(1) Create a diversity of habitat by making small (1/4 to 1 acre) openings in an east to west direction (maximize sunlight). This will encourage fruit-producing shrubs valuable to many wildlife species;

(2) Pile brush along edges of openings to create cover for birds and small mammals;

(3) Encourage mast-producing trees (i.e., oak, beech, hickory);

(4) Leave 5 to 7 snags per acre for food and nesting;

(5) Trees with vines (i.e., berry producers) should be encouraged; and

(6) Exceptionally tall trees (used by raptors for perching and nesting sites) should be encouraged.

These guidelines are important within the remaining undisturbed acreage to offset the loss of valuable wildlife habitat.

Wetland Guidelines

(1) Leave buffer strips of natural vegetation along wetland areas to help filter and trap silt and sediments;

(2) All culverts installed should have screens to lessen potential damage from beavers;

(3) Wetland forests should be managed as per forestland guidelines; and

(4) Wood duck boxes should be placed within the flooded red maple swamp and in some detention ponds.

As mentioned in the previous section, detention ponds often are very beneficial to wildlife and should be designed to support a variety of species such as waterfowl, herons, flycatchers, kingbirds, kingfishers, cedar waxwings, beaver, muskrat, and various amphibians and reptiles. However, in heavily populated areas, some wildlife can become a problem to man. During the planning of detention ponds emphasis should be placed to avoid nuisance wildlife conflicts, particularly with muskrat and Canada geese. Placement of ponds within the red maple swamp and other forest areas will be beneficial to non-nuisance wildlife species, and lessen the chances of conflict situations.

Muskrats often cause damage by burrowing into the banks of dikes and dams. During periods of high water these burrows may weaken the structure causing leakage or a total washout. The following wildlife practices should be considered during construction of any ponds.

(1) Live trapping and releasing in other areas is sometimes effective. A havahart style live trap size 9'x 9' x 27' is commonly used;

(2) Barriers are a practical way to protect dams and banks from burrowing damage. Preconstruction phase is the time to consider several options;

a. Sand or pea gravel placed a foot or more thick on the inner side of the dam extending 2 or 3 feet above and below the normal water line. Riprap or heavy gravel at least three inches also has been effective.

b. Two inch mesh poultry wire, galvanized after weaving, may be placed on the water side of the dam or bank. Extend wire at least two feet below the normal water level and fasten every few feet. Since the wire eventually rusts it should not be used in swimming areas.

c. Placement of cement board barriers laid end to end in a trench in the dam as close as possible to the water's edge. The boards should extend two feet above and two feet below the normal water line.

(3) Eliminate aquatic vegetation as a muskrat food source.

Although Canada geese are usually aesthetically pleasing, they have become a serious nuisance problem in Fairfield County. All development planning should take steps to avoid compounding this already serious nuisance situation. Although detention ponds often are mutually beneficial to man and wildlife, in Westport they may just contribute to this problem. The following practices will lessen potential nuisance goose problems.

(1) Placement of detention ponds in wooded upland sites away from grass areas;

(2) Utilization of buried detention structures if physically and financially feasible;

(3) Create undesirable edge habitat around ponds (i.e., abrupt dropoff, no grass zone such as gravel, bark chips, etc.);

(4) Fencing of ponds;

(5) Education of residents on nuisance problem to assure no feeding of geese within development;

(6) Do not create islands within ponds which can be used as nesting sites; and

(7) Plant vegetation other than grass which will be aesthetically and environmentally acceptable (i.e., pachysandra, honeysuckle, ground juniper, virginia creeper, shrubs).

As areas are developed, there will be an immediate and lasting negative impact on wildlife. The primary impact is the direct loss of habitat due to buildings, roads, driveways, or parking lots. Another impact is the loss of habitat where cover is cleared for lawns and landscaping. A third impact is the increased human presence, vehicular traffic, or free roaming dogs and cats. This will drive the less tolerant species from the site, even in areas where there has been no physical change.

A number of the previously discussed guidelines should be implemented to minimize negative impacts to wildlife from the development project. Other considerations are cluster development of condominium units, a reduction in total units, or landscaping with natural concepts (i.e., conserving the open space area adjacent to the abandoned quarry site because of its value to nesting birds, and avoiding lawns or chemical applications). These considerations would lessen habitat loss and possible water pollution problems. Although no critical wildlife habitat or populations will be eliminated by the proposed development, the cumulative negative impacts on wildlife by development in nearby or surrounding areas should be considered.

Due to the abundance of development presently within the vicinity of the study area and the intensive nature of the proposed project, habitat management practices on a large scale are not feasible. The best approach in this situation would be to encourage residential wildlife habitat management improvement practices. Such activities include providing food, water, cover, and space (Table 1).

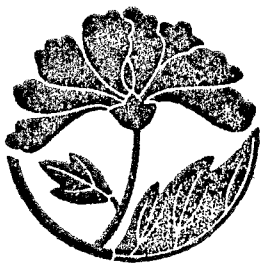
TABLE 1

Suitable Planting Materials for Food and Cover

Herbaceous Vines	Shrubs	Small Trees
panicgrass	sumac	dogwood
timothy	dogwood	crabapple
trumpet creeper	elderberry	hawthorn
grape	winterberry	cherry
birdsfoot trefoil	autumn olive	serviceberry
virginia creeper	blackberry	cedar
switchgrass	raspberry	
honeysuckle	cranberry bush	

Nesting sites can be provided for a great variety of birds with placement of artificial nest boxes (See attached sheet).

LAND USE
AND
PLANNING CONSIDERATIONS



LAND USE AND PLANNING CONSIDERATIONS

Surrounding Land Use

The land use surrounding the site is generally low density residential or vacant land. In addition to all environmental issues, the following issues should be considered: compatibility with surrounding land use, access to adjacent road system, nearly all of which are narrow, winding, two lane (or less) roads.

Westport's Plan of Development

The 1959 Town Plan of Development proposed two acre zoning (0.5 dwelling units per acre for the entire site). In July 1975, an "Update of the Town Plan" entitled "New Directions for Westport" was issued. However, this plan focused on proposed land use along the Boston Post Road, and included a proposal for a "Post Road Multi-family Development Option."

In the 1960's the site was zoned "Designed Development District" and later, largely due to neighborhood concern, the property was rezoned to "Open Space Residential District."

Existing Zoning and Subdivision Regulations

The site is currently zoned "Open Space Residential District" which allows a density of one dwelling unit per acre on a minimum lot size of 50 acres. Any subdivision of land would have to meet the requirements of the Land Subdivision Regulations of the Town of Westport. Under these regulations, the Planning and Zoning Commission can require existing and future sewer installations (see

Section 55-3.4). Also, the Commission can require extensive op n space reservations (Section 56-3.6).

Existing Road Network

The site is surrounded but not penetrated by the Westport Road system. Access exists via a 50 foot strip approximately 575 feet long, which extends out to Newtown Turnpike.

The intersection with Newtown Turnpike is characterized by insufficient sight lines, especially to the south. Called Newtown Avenue in adjacent Norwalk, this road forms a radial north/south major road providing access to both Norwalk and the northwest corner of Westport to and from Exit 41 of the Merritt Parkway.

Frontage exists to the southeast and east along Partrick Road for some 1,740 feet. Partrick Road extends out eastward to join Wilton Road (Route 33) just south of Exit 41 of the Merritt Parkway (Route 15). The 1985 Average Daily Traffic at this point is estimated to be 12,700 vehicles. The level of traffic in this segment is the third highest level along the full 12-mile extent of Route 33 between Westport and the Wilton/Ridgefield town line.

Were this site to be developed residentially, some traffic to and from Norwalk might be inclined to use Crawford Road (which runs eastward from Newtown Turnpike) and Lowlyn Road, a private road posted with "No Thru Traffic" signs, which connects Crawford Road with Partrick Road. Both intersections at either end of Lowlyn Road have bad sight lines.

Existing Infrastructure

Water Supply

This site is presently not served directly by the public water supply. However, the water system for the proposed development will be fed from the public water supply system located along Wilton Road to the east and north, and along Stony Brook Lane to the south.

The Bridgeport Hydraulic Company does plan an eight inch pipe northward along Old Hill Road to Clifford Lane, which is approximately three-quarters of a mile south of the southeast corner of the site. No other further extension is foreseen from this direction, since a costly pumping station would be necessary. For further information, please refer to SWRPA's July 1980 report, "Guide to Ground Water Aquifer Protection".

Particular attention should be given to the boundaries of the Saugatuck River Aquifer, which extends northwesterly along Poplar Plains Brook. It is considered to be a "critical aquifer."

Sewerage

The sewer system for the proposed development will be serviced by means of a force main discharging to a new gravity main to be constructed on Wilton Road, flowing to a Westport municipal sewage treatment facility. The sewer lines will be extended at the expense of the developer. Presently, approximately 35 percent of the town is served by sewers, with only modest extensions planned. No public sewers are contemplated for the study area. Westport has adopted the Federal government policy of protecting the environment by regulating densities rather than actively extending the sewage systems.

Drainage

The site is drained by Poplar Plains Brook, which flows in a northeasterly direction into the Saugatuck River at Lee's Pond. There are three poor drainage areas in the vicinity as identified by the Town of Westport. All are ranked as minor and would cost less than $100,000 in each case. The following areas are included:

(1) Newtown Turnpike at Oakwood Lane;

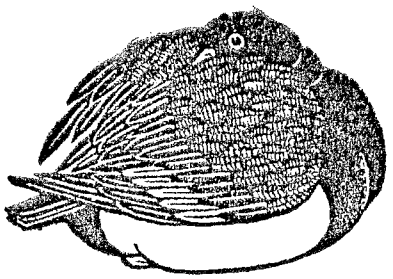
(2) Partrick Road at Norwood Lane; and

(3) Partrick Road at Old Hill Road.

General Comments

The 1983 Regional Plan of Development urges the preservation of the extensive wetland areas on this site. The ERT is not aware of any local proposal to preserve all or part of this site as open space. The alternative residential design provided by the "Open Space Residential District" agrees with the 1983 Regional Plan recommendations regarding wider choice of housing types and the preservation of open space.

APPENDICES



APPENDIX A

VEGETATION INVENTORY

I. PONDS

A. Grasses

Common cattail (*Typha latifolia*)

B. Forbs

Bladderwort (*Utricularia* sp.)
Water milfoil (*Myriophyllum* spp.)
Duckweed (*Lemna* sp.)
Iris (*Iris* sp.)
Spatterdock (*Nuphar variegatum*)

II. POND MARGINS

A. Grasses

Common reed (*Phragmites australis*)

B. Ferns & Other Primitive Species

Sensitive fern (*Onoclea sensibilis*)
Sphagnum moss (*Sphagnum* sp.)

C. Forbs

Touch-me-not (*Impatiens capensis*)
Purple loosestrife (*Lythrum salicaria*)
Seedbox (*Ludwigia alternifolia*)
Goldenrod (*Solidago* sp.)

D. Shrubs and Vines

Pussy willow (*Salix discolor*)
Bayberry (*Myrica pensylvanica*)
Sweet pepperbush (*Clethra alnifolia*)
Speckled alder (*Alnus rugosa*)
Russian olive (*Eleagnus angustifolia*)
Silky dogwood (*Cornus amomum*)
Arrowwood (*Viburnum dentatum*)
Meadowsweet (*Spiraea latifolia*)
Clammy azalea (*Rhododendron viscosum*)
Shadblow (*Amelanchier* sp.)
Highbush blueberry (*Vaccinium corymbosum*)

E. Trees

Grey birch (Betula populifolia)
Black birch (B. lenta)
Quaking aspen (Populus tremuloides)
Cottonwood (P. deltoides)
Red maple (Acer rubrum)
Wild black cherry (Prunus serotina)

III. "NATURAL" FLOODPLAIN WETLANDS

A. Grasses & Grass-Like Species

Tussock sedge (Carex stricta)
Path sedge (C. pensylvanica)

B. Ferns & Other Primitive Species

Harpscented fern (Dennstaedtia punctilobula)
Sensitive fern
Cinnamon fern (Osmunda cinnamomea)
Ground cedar (Lycopodium complanatum)
Sphagnum moss
Turkey tails (Polyporus versicolor)
Scouring rush (Equisetum fluviale)

C. Forbs

Canada mayflower (Maianthemum canadense)
Touch-me-not
Skunk cabbage (Symplocarpus foetidus)
False hellebore (Veratrum viride)
Violet (Viola spp.)

D. Shrubs and Vines

Common greenbrier (Smilax rotundifolia)
Multiflora rose (Rosa multiflora)
Poison ivy (Rhus radicans)
Winterberry (Ilex verticillata)
Sweet pepperbush
Highbush blueberry
Japanese barberry (Berberis thunbergii)
Arrowwood
Maple-leaf viburnum (Viburnum acerifolium)
Winged euonymus (Euonymus alatus)
Elderberry (Sambucus canadensis)
Shadblow
Spicebush (Lindera benzoin)

E. Trees

Cottonwood
Quaking aspen
Black tupelo (Nyssa sylvatica)
Red maple
Black birch
Grey birch
Weeping willow
Norway maple (Acer platanoides)

V. UPLANDS

A. Grasses

Little bluestem (Andropogon scoparius)

B. Ferns

New York fern (Thelypteris noveboracensis)

C. Forbs

Ragweed (Ambrosia artemisiifolia)
Giant ragweed (A. trifida)
Lamb's quarters (Chenopodium alba)
Field dock (Rumex crispus)
Common plaintain (Plantago major)
Butter-and-eggs (Linaria vulgaris)
Common mullein (Verbascum thapsus)
Evening primrose (Oenothera biennis)
Yarrow (Achillea millefolium)
Asters
Cinquefoil (Potentilla sp.)
Queen Ann's lace (Daucus carota)
Round-headed bush clover (Lespedeza capitata)
Blue curls (Trichostema dichotum)
Grey goldenrod (Solidago nemoralis)
Cypress spurge (Euphorbia cyparissias)
Striped wintergreen (Chimaphila maculata)
Indian pipes (Monotropa uniflora)

D. Shrubs & Vines

Common blackberry (Rubus allegheniensis)
Poison ivy
Grape (Vitis sp.)
Choke cherry
Bush honeysuckle (Diervilla sessilifolia)
Forsythia (Forsythia suspensa)
Winged euonymus
Pachysandra (Pachysandra terminalis)

Mountain laurel (Kalmia latifolia)
Japanese barberry
Sumac (Rhus spp.)
Oriental bittersweet (Celastrus orbiculatus)

E. Trees

White pine (Pinus strobus)
Red cedar (Juniperus virginiana)
White oak (Quercus alba)
Red oak (Q. rubra)
Pin oak (Q. palustris)
Tree-of-heaven (Ailanthus altissima)
American beech (Fagus grandifolia)
Black birch
Grey birch
Flowering dogwood (Cornus florida)
Red maple
Norway maple
Crabapple (Malus floribunda)
Black locust (Robinia pseudoacacia)
Quaking aspen
Wild black cherry

Brown Thrasher (Toxostoma rufum)
Gray Catbird (Dumetella carolinensis)
House Wren (Troglodytes aedon)
Common Yellowthroat (Geothlypis trichas)
Yellow Warbler (Dendroica petechia)
American Crow (Corvus brachyrhynchos)
Black-capped Chickadee (Parus atricapillus)
Tufted Titmouse (P. bicolor)
Red-winged Blackbird (Agelaius phoeniceus)
Northern Cardinal (Cardinalis cardinalis)
House Sparrow (Passer domesticus)
Slate-colored Junco (Junco hyemalis)
American Robin (Turdus migratorius)
Mourning Dove (Zenaida macroura)
Mallard (Anas platyrhynchos)

APPENDIX C

DIMENSIONS FOR BIRD BOXES

BIRDHOUSE POINTERS

Wood is the most suitable, all-around building material. Do not use tin cans because summer sun may kill the occupants.

Natural finishes or dull colors are better for exteriors than bright colors, except for martin houses, which should be painted white to reflect the sun.

Do not make the entrance hole too large.

Clean old nest materials out of birdhouses well ahead of the time for migrants to return in spring.

A few small holes in the nest box floor will permit drainage if rain blows in.

Ventilation gives greater comfort, and this can be accomplished with a few small holes or slits through the walls beneath the roof overhang.

Build houses so they can be easily opened for cleaning.

Remember that climbing predators, especially cats, are a threat to nesting birds. Protect the birds with metal posts or metal guards on posts.

Most birds do not need perches on the front of the box, and perches can aid predators in raiding the bird home.

Inner surfaces of the house should be rough so young birds can better cling to the sides when the time comes to leave home.

Face the entrance away from prevailing winds.

A deep woods is a poor location for most birdhouses, but the edge of the woods may be excellent.

DIMENSIONS FOR BIRD BOXES

Species	Length and width	Depth of cavity	From entrance to floor	Diameter of entrance	Height above ground
	Inches	Inches	Inches	Inches	Feet
Bluebird	5 × 5	8	6	1½	5–10
Chickadee	4 × 4	8–10	6–8	1⅛	6–15
Titmouse	4 × 4	8–10	6–8	1¼	6–15
Nuthatch	4 × 4	8–10	6–8	1¼	12–20
House wren	4 × 4	6–8	1–6	1–1¼	6–10
Bewick's wren	4 × 4	6–8	1–6	1–1¼	6–10
Carolina wren	4 × 4	6–8	1–6	1½	6–10
Violet-green swallow	5 × 5	6	1–5	1½	10–15
Tree swallow	5 × 5	6	1–5	1½	10–15

Species	Length and width	Depth of cavity	From entrance to floor	Diameter of entrance	Height above ground
	Inches	Inches	Inches	Inches	Feet
Purple martin	6 × 6	6	1	2½	15–20
Prothonotary warbler	6 × 6	6	4	1½	2–4
Crested flycatcher	6 × 6	8–10	6–8	2	8–20
Flicker	7 × 7	16–18	14–16	2½	6–20
Golden-fronted woodpecker	6 × 6	12–15	9–12	2	12–20
Red-headed woodpecker	6 × 6	12–15	9–12	2	12–20
Downy woodpecker	4 × 4	9–12	6–8	1¼	6–20
Hairy woodpecker	6 × 6	12–15	9–12	1½	12–20
Screech owl	8 × 8	12–15	9–12	3	10–30
Saw-whet owl	6 × 6	10–12	8–10	2½	12–20
Barn owl	10 × 18	15–18	4	6	12–18
Sparrow hawk	8 × 8	12–15	9–12	3	10–30
Wood duck	10 × 18	10–24	12–16	4	10–20

DIMENSIONS FOR OPEN PLATFORMS

Species	Dimensions	Height above ground
Robin	6″ × 8″	6–15 feet
Barn swallow	6″ × 6″	8–12 feet
Phoebe	6″ × 6″	8–12 feet

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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 identifying 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.