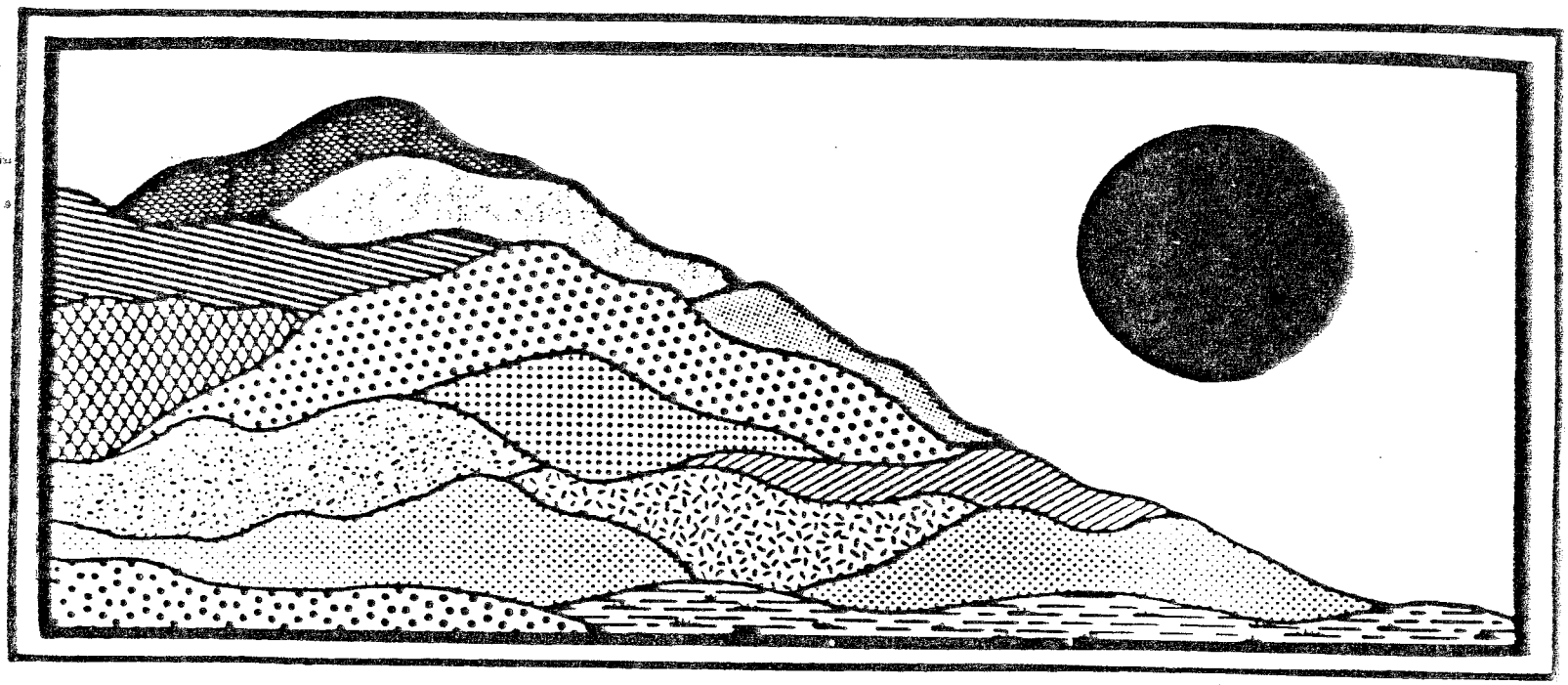
Quassett Lake

Woodstock, Connecticut

November 1985



ENVIRONMENTAL REVIEW TEAM REPORT

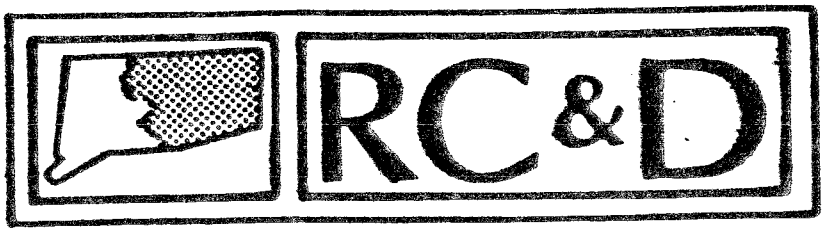
EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

Quassett Lake

Woodstock, Connecticut

Review Date: 7-23-85

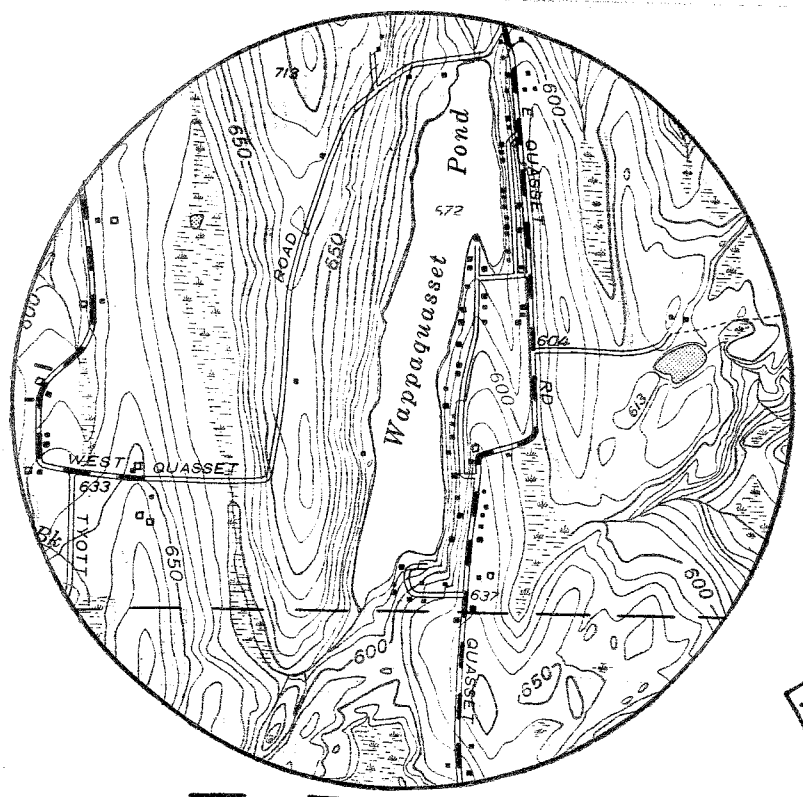
Report Date: 11-85

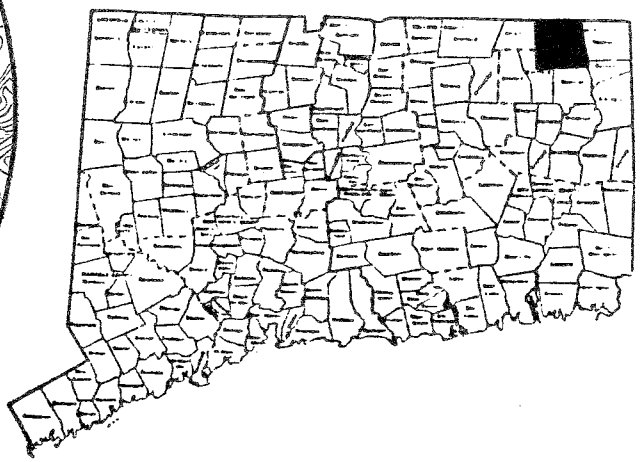


ENVIRONMENTAL REVIEW TEAM
PO BOX 198
BROOKLYN CONNECTICUT 06234

Site Location

QUASSETT LAKE
WOODSTOCK, CONNECTICUT





EASTERN CONNECTICUT

RESOURCE CONSERVATION

& DEVELOPMENT AREA

ENVIRONMENTAL REVIEW TEAM REPORT
ON
QUASSETT LAKE
WOODSTOCK, CONNECTICUT

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

The ERT met and field checked the site on Tuesday, July 23, 1985. Team members participating on this review included:

Margaret Beauharnois	- Regional Planner - Northeastern Connecticut Regional Planning Agency
Donald Capellaro	- Sanitarian - CT Department of Health
Howard Denslow	- District Conservationist, U.S.D.A., Soil Conservation Service
Joseph Hickey	- Recreation Planner - DEP, Parks and Recreation
Nancy Marin	- Lake Ecologist - DEP, Lakes Management Unit
Dick Raymond	- Forester - Department of Environmental Protection
Eric Schluntz	- Fisheries Biologist - Department of Environmental Protection
Elaine Sych	- Environmental Review Team Coordinator - Eastern CT RC&D Area
Bill Warzecha	- Geologist - DEP, Natural Resources Center

Prior to the review day, each Team member received a summary of the concerns of the Town and the Lake District, a soils map, and a topographic map showing the boundaries of the study site. During the field review the Team met with the President of the Quassett Lake District to discuss specific problems and concerns. Following the review, reports from each team member were submitted to the ERT Coordinator for compilation and editing into this final report.

This report represents the Team's findings. It is not meant to compete with private consultants by providing site designs or detailed solutions to development problems. The Team does not recommend what final action should be taken to mitigate or solve problems -- all final decisions and conclusions rest with the Town and the landowners. This report identifies the existing resource base and evaluates its significance, and also suggests considerations that should be of concern to the Town and the Lake District. The results of this Team action are oriented toward development of better environmental

quality and the long term economics of land use.

The Eastern Connecticut RC&D Project Committee hopes you will find this report of value and assistance in making your decisions and evaluations of Quassett Lake and its watershed.

If you require any additional information, please contact:

Elaine A. Sych
ERT Coordinator
Eastern Connecticut RC&D Area
P.O. Box 198
Brooklyn, CT 06234
(203) 774-1253

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I. INTRODUCTION

The Eastern Connecticut Environmental Review Team was asked to prepare a natural resource inventory for the watershed of Quassett Lake, also known as Wappaquassett Pond, located in southern Woodstock. The Town and the Lake District Association hope to use this report for planning in the watershed area and for maintenance and improvement of the current water quality of the lake

Quassett Lake receives runoff from a watershed of approximately 660 acres. Land use in the watershed includes residential development, orchards, hayland, corn silage land, forest land , wildlife wetland, and roads. It should be noted that the Town does not have zoning. Most dwellings in the watershed are located along the eastern periphery of the lake. There are approximately 80 homes, of which some 40 are occupied on a year round basis. The western side tends to have large lots and is undergoing recent development.

At the present time, the northern end of the lake appears to be in the best condition, as far as weed growth, while the middle portion, off a point on the east side and towards the upper end, tends to foster the worst conditions. Extensive wetlands with watercourses which flow into the lake are located to the south and west. An earthen/concrete dam and spillway is at the northern end of the lake along West Quassett Road.

In the following sections information is given about the existing condition of the natural environment, and recommendations are discussed to mitigate and improve any concerns and problems.

II. LAKE FEATURES

The approximate morphological characteristics of Wappaquassett Pond are as follows:

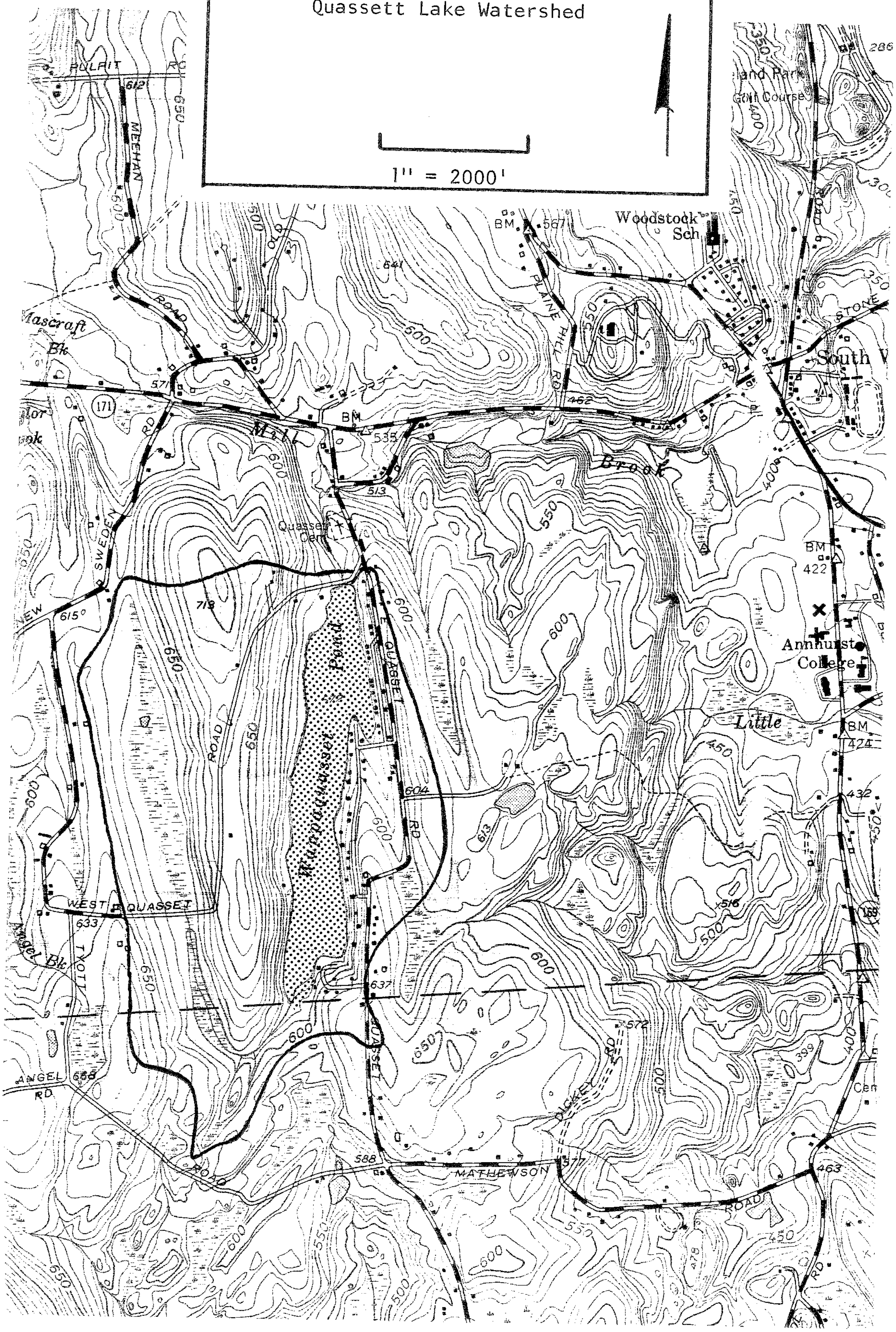
Surface Areas	=	100.3 acres*
Maximum Depth	=	11 feet*
Mean Depth	=	5.8 feet*
Volume	=	25,340,594 cubic feet
Watershed Area	=	660 acres
Retention Time	=	157 days

*Source: 1959 Fishery Survey

TOPOGRAPHY

Quassett Lake Watershed

1" = 2000'



III. TOPOGRAPHY AND SETTING

Wappaquassett Pond, also known as Quassett Lake, is a small surface water body, which is under the ownership of property owners within the Quassett Lake District. It is a long, relatively narrow pond located in the southeast corner of town. The pond is artificial in origin and was created by the impoundment of a tributary to Mill Brook. The masonry and earthen dam is found at the northern end of the pond.

Most of the Quassett Pond watershed area is located west of the pond. The primary source of surface water to the pond appears to originate in the linear-shaped wetland in the western parts. The outflow is located on the pond's north shore.

The land surface in the watershed varies from gentle slopes which characterizes the tableland of the hills in the watershed to steep slopes, most of which rise from the eastern and western shoreline of the lake.

Elevations in the watershed range from a high of 713 feet above mean sea level at the top of the hill in the northern parts to a low of 572 feet above mean sea level at the surface of Quassett Lake.

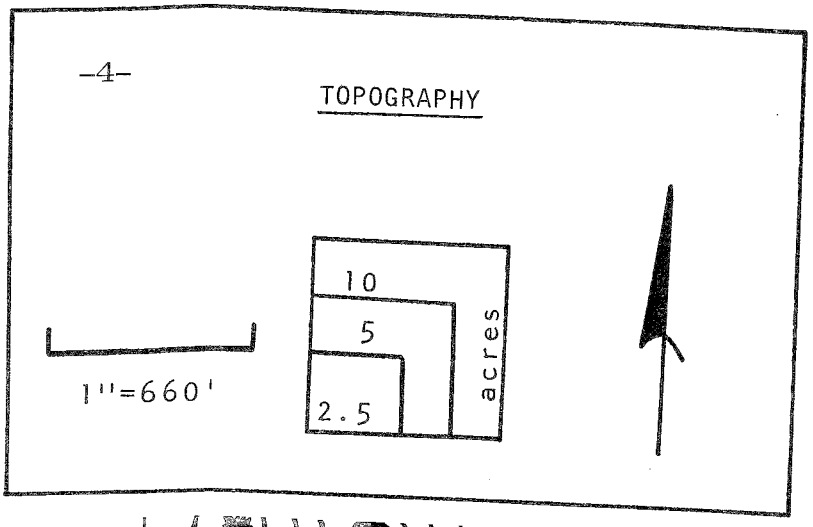
The watershed is comprised mainly of agricultural land used for pastures and cornfields, woodlands, and an apple orchard in the northern parts. The eastern side of the pond has undergone intense residential during the past thirty years. According to a Quassett District Lake resident, approximately half of the waterfront homes are year around residences. These homes are served by on-site septic systems and on-site wells. Based on cursory inspection on the review day, many of the waterfront homes appear to be served by shallow, dug wells.

IV. GEOLOGY

The bedrock geology of the Putnam topographic quadrangle, which encompasses the entire lake watershed, was mapped by H. Roberta Dixon. The U.S. Geological Survey published the map (GQ-1562) in 1982. The accompanying bedrock geologic map adapted from Dixon's map shows the distribution of rock types in the watershed.

Dixon identifies two principal rock types in the watershed: the Hebron Formation and pegmatites. The most extensive type is the Hebron Formation. Exposures of this rock were not seen in the watershed on the review day. The lack of outcrops in the Hebron Formation is mainly due to its non-resistance to weathering processes. These rocks consist of a dark-gray, greenish-gray, and purplish gray, fine-grained to medium grained, thinly layered schist composed

TOPOGRAPHY


1"=660'
10
5
2.5
acres

Wappaquasset Pond
572
600
650
ROAD
QUASSET
604
637

mainly of the minerals quartz, feldspar, micas (biotite and muscovite), and epidote. Accessory minerals include opaque minerals, apatite, zircon, tourmaline, sphene, and rarely garnet. "Schists" are crystalline, metamorphic rocks (rocks geologically altered by great heat and pressure). These stresses (heat and pressure) caused the alignment of platy, flaky and elongate minerals, e.g., biotite and muscovite into thin sheets. As a result of this mineral alignment, the rock is commonly slabby (one that parts relatively easily along surfaces of mineral alignment). The rocks are believed to be Silurian in age (408 to 438 million years old) or older and originated from deep ocean sediments.

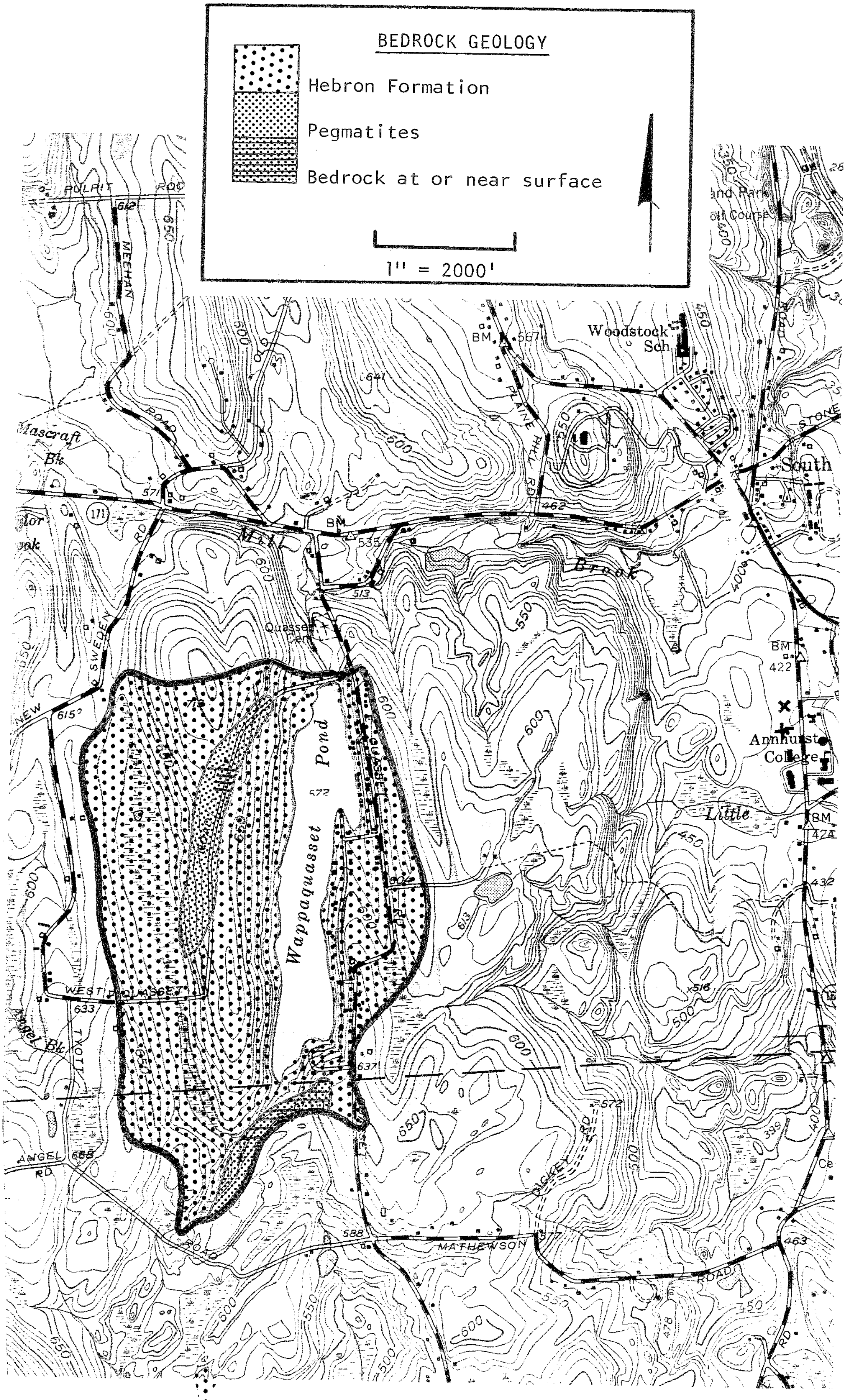
Pegmatites, the other rock type found in the watershed underlies and/or outcrops west of the pond and in the southern parts. It outcrops extensively in the southern parts of the watershed. They consist of light-colored, coarse- to fine-grained rock composed of varying proportions of quartz, microline, and oligoclase with lesser amounts of biotite and muscovite.

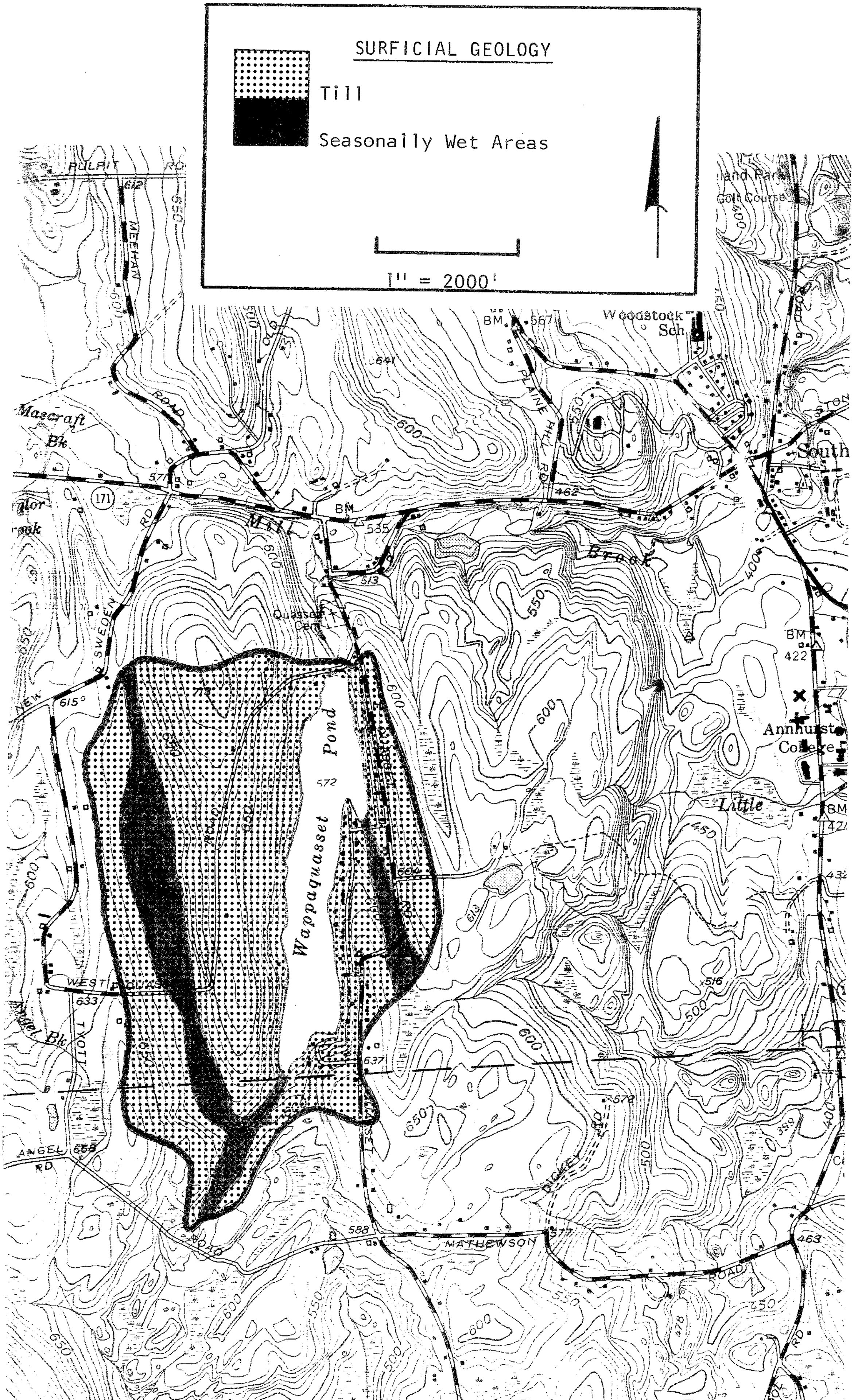
The pegmatities underlying the watershed are believed to be of Devonian geologic age (360-408 million years ago). Therefore, they are younger in age then the surrounding rocks of the Hebron Formation. Pegmatites originated as molten magma (igneous rocks) that found their way into the weak schist rocks of the Hebron Formation. Zones of weaknesses in the Hebron Formation include the space between the layering in the rock, as well as fractures and fault zones. The type of pegmatite body which intruded the surrounding rocks generally parallel to the layers in the rock, are referred to as a sill. The pegmatite bodies which fill voids in fractures or fault zones in the surrounding rocks, and which are at angle to the layering of the rock, are referred to as dikes.

Depth to bedrock in the watershed ranges from zero in rock outcrop areas, to 40 feet or deeper beneath the streamlined hills (drumlins) west and southeast of the lake.

Surficial geologic materials consist of those unconsolidated rock particles or other debris that overlie the bedrock in the watershed. The surficial geology for the Putnam quadrangle has not been mapped to date. The Team's geologist referenced the "Soil Survey for Windham County" published by the Soil Conservation Service, Department of Agriculture, for the purpose of this section.

The predominant surficial geologic material is till. Till consists of rock particles and fragments that were accumulated by a moving sheet of glacier ice and later redeposited directly from the ice. The glacier acted as a giant bulldozer, churning up pre-existing soils and scraping, gouging, and breaking bedrock surfaces. Since the ice collected rock particles of all sizes and since these particles were not sorted by meltwater, till contains everything from clay to boulders and it is locally very variable in texture. Two major till varieties have been observed in eastern Connecticut: a fairly loose, coarse-grained, olive-gray to olive-brown or yellowish-brown till and a finer-grained, compact, often crudely layered, olive-brown to light olive-brown till. The coarser till is most common in surface exposures, but the compact variety may underlie it. The thickest till in the watershed is probably located on the hills just west southeast of Quassett Lake; the thinnest till is that


BEDROCK GEOLOGY
Hebron Formation
Pegmatites
Bedrock at or near surface
1" = 2000'
Wappaquasset Pond
Mill Brook
Woodstock Sch.
Annhurst College
Quasset Cem.
South


SURFICIAL GEOLOGY
Till
Seasonally Wet Areas
1" = 2000'
Wappaquasset Pond
Mill
Brook
Little
Woodstock Sch.
Annhurst College
Quasset Cem.
MATHEWSON
ROAD
WEST
ANGEL
RD
SWEDEN
NEW
MEEHAN
PULPIT
PLAINE HILL RD
Mascraft Bk
Golf Course
South

which mantles the west sloping hill, west of West Quassett Road and in the southern parts of the watershed.

Seasonally wet areas overlie till deposits in the western, eastern and southern parts of the watershed. These soils which are delineated by the symbols Rd and Rn (Ridgebury and Ridgebury, Leicester, Whitman soils), respectively on the accompanying soils map, generally parallel the streamcourse within the watershed.

V. HYDROLOGY

The watershed of Quassett Lake may be defined as that land area from which all of the natural water input to the Lake is derived. As shown by the accompanying watershed map, the watershed boundary tends to follow along the crests of the local hills. The watershed as depicted comprises about 660 acres or about 1.03 square miles.

Precipitation which takes the form of surface runoff flows across the surface of the land until it reaches a brook or other body of water. Precipitation may also be absorbed into the ground. Once it is absorbed, the water may either be returned to the atmosphere through evaporation and transpiration or percolate downward to the water table and become groundwater. Once the water reaches the groundwater table it moves slowly downslope by the force of gravity, ultimately discharging to the surface in the form of a spring, wetland, stream, or directly into the lake. Generally speaking, groundwater flow in the watershed parallels the surface flow pattern and is largely controlled by the underlying bedrock or compact layer present in the till-based soils.

The major feeder stream to Quassett Lake is the unnamed outlet stream for the swamp in the western parts. There are numerous intermittent drainage channels primarily in the eastern and western parts of the watershed which feed the Lake during periods of precipitation and/or wet times of the year.

Although there is no gaging station at the outlet of Quassett Lake, it is possible to estimate the flow duration characteristics of the outlet stream using a method described in "Stream Flow Information for Connecticut with Applications to Land-Use Planning," Connecticut Dept. of Environmental Protection No. 35, by Michael A. Cervione, Jr.

TABLE 1 Estimated flow duration characteristics of unnamed stream at the outlet of Quassett Lake.

Percent of time flow equalled or exceeded	1	5	10	30	50	70	90	99
Flow equalled or exceeded in millions gallons per day	7.4	4.1	3.0	1.4	.73	.3	.04	0.0
Flow equalled or exceeded in CFS	11.4	6.34	4.64	2.16	.82	.46	.06	0.0

The mean annual outflow from Quassett Lake is estimated to be 1.85 cubic feet per second or about 1.12 million gallons per day.

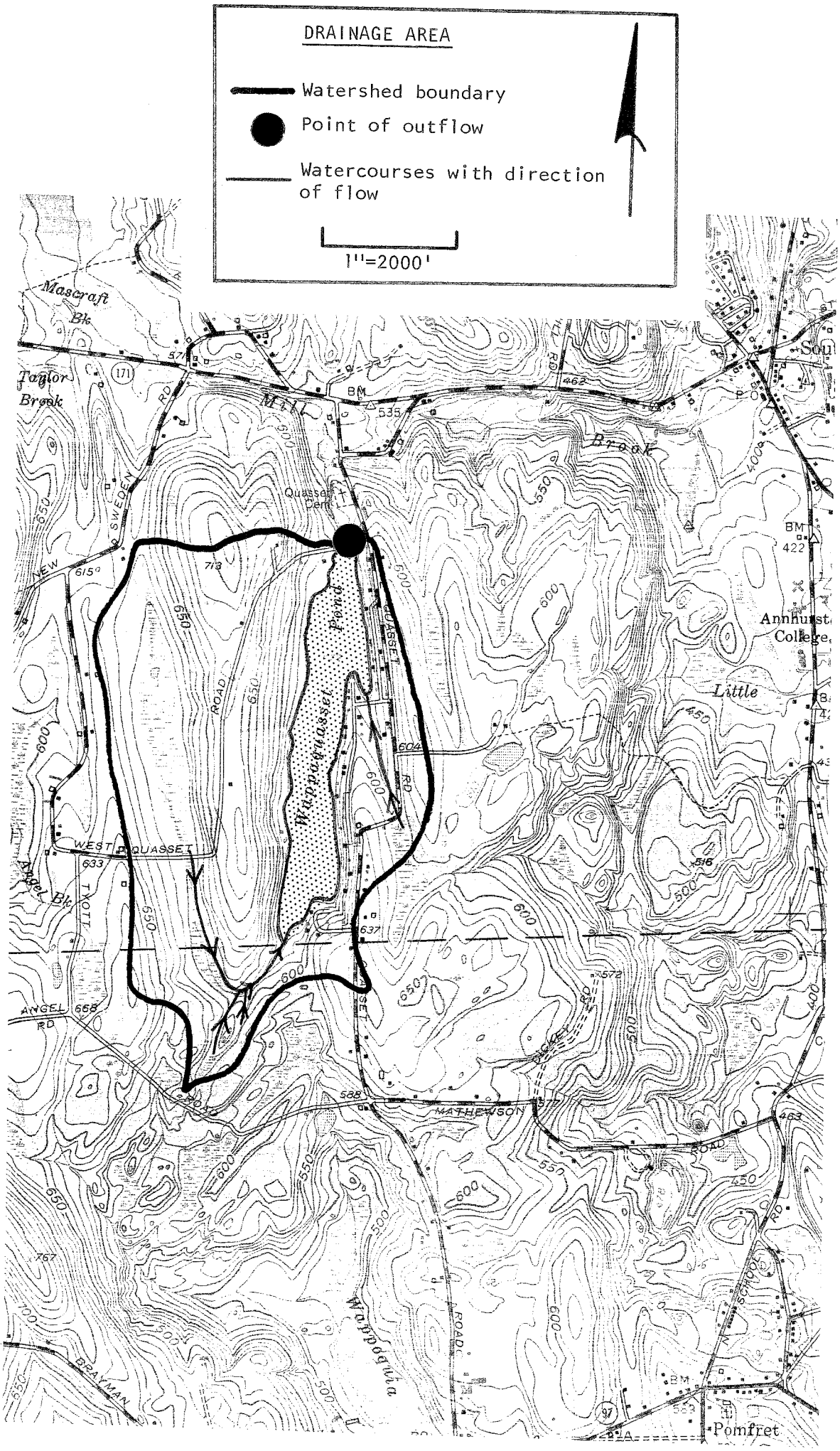
It is possible to estimate how long it would take Quassett Lake to refill if it was completely drained. This estimate can be calculated from the formula for retention time:

$$\text{Retention Time} = V/R \times D \times N$$

Where V is the volume of the Lake, R is the rate of runoff in the watershed, D is the approximate drainage area for the impoundment, and N is a constant which equals the number of seconds in one day. "Retention time" may be defined as the time period required for a body of water to flush once.

Quassett Lake has a watershed area of about 1.03 square miles, a volume of 25,340,594 cubic feet, and a rate of runoff of 1.8 cubic feet per second per square mile. The latter value is obtained from U.S. Geological streamflow data for the water years 1931 to 1960 for the local geographic areas. There are 86,400 seconds in a day. If these values are plugged into the formula mentioned earlier, the retention time can be estimated to be 157 days.

In addition, it is possible to determine how long it would take Quassett Lake to refill if the water level was lowered by 50% (this would reduce the volume of the Lake to about half its present capacity). The purpose of a drawdown might enable Lake front residents to maintain beach front property and beaches or might be a viable alternative for controlling a weed growth problem.


DRAINAGE AREA
Watershed boundary
Point of outflow
Watercourses with direction of flow
1"=2000'
Mascraft Bk
Taylor Brook
Mill Brook
Quasset Cem
SWEDEN
NEW
ROAD
Wappaquasset Pond
QUASSET
WEST QUASSET
TYOTT
Angel Bk
ANGEL RD
MATHEWSON
ROAD
Wappaquilla
BRAYMAN
Annhurst College
Little
Pomfret
BM 535
BM 422
BM 533

Based on a flow rate of .46 cubic feet per second (CFS), it is estimated that it would take approximately 309 days to refill the Lake to its normal capacity if the volume of the Lake was reduced to about half its present capacity. Flow rate of .46 cubic feet per second, which would be expected during a dry period (fall season) would be equalled or exceeded 70 percent of the time according to Table 1.

On the other hand, if a flow rate of 2.16 cubic feet per second (CFS) was used, it is estimated that the Lake would refill in approximately 66 days. According to Table 1, a flow rate of 2.16 cubic feet per second would be equalled or exceeded 30 percent of the time and would most likely occur during the wet times of the year (spring). It should be pointed out that these flow rates are based on long term observations of conditions in the State. An exceptionally wet fall or dry spring could greatly effect the time period for the Lake to refill.

If the water level of Quassett Lake is lowered, whether for beach front maintenance or to control the weed problem, it would be important to conduct a survey to determine if there are any dwellings along the shoreline which are served by dug wells. Because dug wells are usually shallow and tap the local water table, the lowering of Quassett Lake may adversely affect the water table of nearby dug wells. As a result, dug wells serving homes around the Lake may be dried up or the volume of water in the well(s) seriously diminished.

VI. WATER QUALITY

Eutrophication

Eutrophication is a natural aging process through which a waterbody gradually increases in fertility and biological productivity, and fills in with accumulations of organic deposits. As eutrophication proceeds, algae blooms increase in both intensity and duration, and aquatic plant growth becomes more prolific. The lake becomes shallower and the deep, cold waters are lost. During the latter stages of this process, the waterbody becomes a boggy or marshy wetland.

Under natural conditions the eutrophication process usually advances very slowly over thousands of years. The process can be accelerated by activities of man which increase nutrient and sediment inputs to a waterbody.

In general, there are three accepted stages of eutrophication which are defined as follows:

1. Oligotrophic = early stages of the process, very infertile, low biological productivity, high transparency, usually highly oxygenated and relatively deep with little accumulation of organic sediments on the bottom.

2. Mesotrophic = a mid-range between the two extremes of oligotrophic and eutrophic.

3. Eutrophic = late stages of the process, very fertile (high in plant nutrients such as nitrogen and phosphorous), high in biological productivity, low in transparency, bottom waters usually show reduced levels of dissolved oxygen with an abundance of organic matter on the bottom.

Phosphorous has been identified as the growth limiting nutrient in the majority of Connecticut lakes. The term "limiting nutrient" refers to the nutrient which is in the shortest supply relative to growth requirements. In general, algae and macrophytes will grow until the supply of some basic nutrient is depleted. Then any increase in that nutrient will result in a corresponding increase in biological productivity. Similarly, a reduction in that nutrient will reduce potential biological productivity. Enrichment of a lake with plant nutrients is the fundamental cause of eutrophication.

Undisturbed woodland contributes lower nutrient loads to a lake than other land uses. The nutrient loading from agricultural land is generally about five times greater than woodland. Residential and commercial land typically contribute more than ten times the nutrient loading that results from woodlands. Thus, as woodland is converted to other uses, or as agricultural land is converted to residential land, the nutrient contribution to the lake increases, advancing the eutrophication process. Although much of this increase in nutrient export from the watershed is inevitable and unavoidable, best management practices can provide for some degree of mitigation.

It should be noted that the Connecticut DEP has recently revised (1984) a report entitled "A Watershed Management Guide for Connecticut Lakes." The DEP report discusses in detail the process of eutrophication and methods of control. According to the DEP's report, the following factors may contribute nutrients to a waterbody and therefore accelerate the eutrophication process: erosion and sedimentation, septic systems, lawn and garden fertilizers, yard and garden vegetation disposal, agricultural land, timber harvesting, stormwater runoff, waterfowl, atmosphere, lake sediments. The key to controlling the eutrophication process is controlling the nutrient enrichment from these sources. The DEP's "Watershed Management Guide" is recommended reading and is available from the Department at 566-2588.

Wappaquassett Pond is presently experiencing conditions typical of mesotrophic lakes. Additional residential development or agricultural activities which do not employ best management practices will serve to worsen these conditions. Local agencies should consider developing and implementing watershed management practices to mitigate the effects of land-use changes in the watershed. The nutrient sources believed to be the most significant at Wappaquassett Pond are discussed in the next section of this report.

It is recommended that the Lake Association develop a watershed management plan as outlined in the DEP Watershed Management Guide for Connecticut Lakes.

Potential Nutrient Sources

Erosion and Sedimentation - Erosion and sedimentation within a lake watershed is a natural process, the rate of which can be greatly increased by human activities that disturb the land.

Eroded soil contributes to eutrophication in several ways. Nutrients associated with the soil particles are introduced to lake waters. Sedimentation reduces water depths creating conditions conducive to the growth of aquatic weeds. Organic matter, associated with the soil particles, is decomposed by the soil bacteria which depletes oxygen overlying the lake sediments.

In 1983, the Connecticut General Assembly enacted legislation entitled "An Act Concerning Soil and Sediment Control" which amends local zoning pursuant to Section 2-8 of the Connecticut General Statutes. This legislation requires the Connecticut Council on Soil and Water Conservation to develop erosion and sediment guidelines and model regulations for municipalities. The legislation also mandates the adoption of municipal erosion and sediment control programs by July 1, 1985.

Lakeside residents and lake users should urge their town to adopt and utilize erosion and sedimentation ordinances in their zoning regulations.

Local officials should see to the correction of any existing sources of erosion, sedimentation and runoff within the Wappaquassett Pond watershed.

Septic Systems

Sewage disposal in residential areas not serviced by sanitary sewers is accomplished with on-lot subsurface disposal systems commonly referred to as septic systems. When functioning properly, septic systems provide for the sanitary breakdown of wastewaters into simple chemical substances including soluble phosphorus compounds. The basic components of the system include a house sewer, septic tank, distribution system, and leaching field. Sewage is delivered to the septic tank via the house sewer. In the septic tank, solids are physically separated from liquids (primary treatment) by the sedimentation of heavy solids to form a sludge blanket, and the flotation of light solids to form a scum layer. The distribution system delivers the liquids to the leaching field. The liquid effluent is decomposed biologically (secondary treatment) in the leaching system.

A septic system can fail if it is not properly designed, installed, or maintained. A failing system will either result in the backflow of wastewaters into the house, or the breakout of wastewaters on the surface of the ground. A failing septic system can contribute phosphorus and other pollutants to lake waters. A far more important consideration, however, is that a failing septic system is a public health hazard. The public health threat is an overriding concern which demands correction of the problem, irrespective of lake eutrophication.

Lawn and Garden Fertilizers - Lawns and gardens are generally very efficient at utilizing soil nutrients and preventing their loss through runoff and leaching. However, runoff and leaching of nutrients can occur if fertilizer applications exceed nutrient requirements, or if fertilizers are applied prior to storm events which cause runoff. These situations can be avoided if fertilizers are matched to soil requirements, and if applications are timed to avoid periods of runoff. Soil test kits can be purchased at a nominal charge from the University of Connecticut Cooperative Extension Service county offices. The samples are analyzed at the Extension Service Laboratory, and the results identify soil nutrient deficiencies.

Yard and Garden Vegetation Disposal - Leaves, grass clippings, and other vegetative material from yard and garden maintenance should not be deposited in a location where the material may be washed into the lake. Vegetative material will add to the sediment in the lake and will provide plant nutrients upon decomposition. Each property owner should select a suitable site away from the lake and its watercourses for the composting of vegetative material.

Waterfowl

Ducks and geese are generally considered attractive wildlife assets which enhance the aesthetic appeal of a lake. However, large numbers of migratory waterfowl which spend considerable periods of time on a lake can contribute appreciable loadings of phosphorus and nitrogen to lake waters. In a study of one Connecticut lake, it was estimated that the phosphorus in the exrement of four geese in one month was equivalent to the total annual loading of phosphorus from 2.5 acres of watershed land. In order to quantify the impact of waterfowl on a lake, it is necessary to develop accurate information on waterfowl population numbers, feeding habits, resting areas, and periods of occupancy. In the absence of detailed information, it should be recognized that large flocks of migratory waterfowl which stop at a lake for many weeks can be an important factor in the eutrophication process.

Lake Management Alternatives

At the present time Wappaquassett Pond is experiencing moderate growths of aquatic macrophytes and algae which may, in some localized areas, interfere with recration.

Aquatic Weed Control

There are disadvantages to any weed control method. A few of the problems which may be encountered are:

1) Those macrophytes which are resistant to the control method employed may multiply due to a reduction in competitive pressures from other species.

2) If the weeds are removed, the loss of habitat, spawning areas and a food source for fish and other aquatic organisms may be incurred.

3) After the weeds are removed, nutrients could be made available to algae and subsequently, "blooms" may occur.

The most common means of aquatic weed control are: winter drawdown, weed harvesting, chemical treatments, drawdown and excavation, and hydraulic dredging. Each of these control methods is discussed below.

1. Winter Drawdown

If the spillway has the capacity to effectively lower the water level, the lake may be drawdown in the fall to expose the sediments. Over the winter, the bottom freezes and destroys roots, vegetative parts and susceptible seeds. Winter drawdown will not kill algae. Winter drawdown should be coordinated with fisheries experts to prevent impacts on fish population.

2. Weed Harvesting

Weed harvesting entails the mechanical cutting of the weeds. Although the method provides immediate relief, it may have to be repeated at periodic intervals.

3. Chemical Treatment

The use of any algicide or herbicide within the waters of the State is governed by statute (Sec. 430 of Public Act 872) and permits are required from the Pesticide Compliance Unit of DEP.

Chemical treatments are generally only "cosmetic" and repeated applications may be necessary.

4. Drawdown and Excavation

Drawdown and excavation is sometimes employed to remove the substrate utilized by the plants for growth. The process increases water depth to levels where plants growing on the bottom will not receive enough light to survive. The effects of this method are generally long-termed.

The drawdown and excavation process requires the use of heavy equipment and it must be determined whether the pond bottom could support this weight.

This method has a relatively high capital outlay; however, the restorative effects are long termed.

If this method is given further consideration, a feasibility study should be conducted to "map" lake sediments according to depth, composition, and underlying substances. Final disposal of excavated sediments should also be explored during the feasibility study. Hydraulic dredging (see discussion below) accomplishes the same goal as drawdown and excavation, but is more costly due to increased specialization and complexity.

It is recommended that the Lake District, when developing a plan for improving an area of the Lake for a beach, consult with the DEP Water Compliance Unit, the Soil Conservation Service District Office, DEP Fisheries, and local inland/wetlands agencies to ensure that best management practices are employed and that all possible impacts are explored.

5. Hydraulic Dredging

Under this method, specialized sediment dredges are employed to remove underwater sediments by suction as a slurry. The slurry must be dewatered prior to final disposal, and the decant water usually must be treated to remove solids and nutrients prior to disposal. The development of dewatering containment basins of suitable size and location is a major and expensive undertaking. However, where environmentally and financially feasible, this method can provide improvement if other methods are unsatisfactory.

VII. SEWAGE DISPOSAL

Residential development along the eastern shoreline is very dense. According to a lakeside residence, about half of the eighty homes in this area are year around. Based on visual observations and a copy of a plan showing property boundaries, it appears that many of the lake front homes were constructed on small lots and some very close to the high water mark of the lake.

While it is expected that all or most current land owners have septic tanks and some type of subsurface leaching facilities, it probably is not known how well many of these systems actually conform to present day code standards. Phosphates and nitrate enrichment of ground or surface water from sewage effluent, unless adequately diluted, could contribute to accelerated algae and weed growth. Based on verbal communication with two former sanitarians at the Northeast District Department of Health, which Woodstock belongs to, there have been a few repairs done on septic systems serving homes on the Lake. In addition, another former sanitarian with the District stated that a sanitary survey of lake side residences was conducted by the department several years ago. The Team was unable to get a copy of this report.

In addition, due to the presence of moderate to steep slopes and till-based soils (slow percolation rate, compact layer, elevated groundwater table), it seems that these lots would be only marginally suited for on-site sewage disposal systems and would probably require engineered septic systems. As a result, unless these systems were properly designed, installed inspected and maintained, it seems likely that these existing systems could malfunction and ultimately discharge sewage effluent into the Lake, particularly during periods of heavy precipitation and/or during summer months when cottages get heavy use by residents. The potential for septic discharges in these areas may ultimately threaten the water quality of the Lake as well as create a public health nuisance condition.

Following are some steps which could be taken to protect the sanitary quality of the lake water as well as prevent degradation to the aesthetic and recreational aspects:

A. Periodic sanitary surveys conducted by the regulatory health department in order to detect any malfunctioning sewage disposal system(s) and to obtain abatement and satisfactory correction of any problem(s). This may include the introduction of fluorescene dye in residential toilet systems during the wet spring months in order to determine proper system function.

B. Careful review of any seasonal dwelling proposed for year round occupancy unless such property meets present day code requirements for sewage disposal or there is sufficient, suitable area available for the installation of necessary facilities (water supply and sewage disposal).

C. Possible adoption of zoning to assure lots would meet a minimum size(s) for development.

It is noted from soil service mapping data that much of the upland areas around the lake contain hardpan soils which have a seasonal high ground water condition. Proper evaluation of perched water and the perviousness or lack of such of the underlying hardpan layer are necessary for proper design and functioning of sewage leaching systems.

D. Review (survey) for agricultural activities on the watershed which may contribute to surface runoff of manure, fertilizers or cause erosion and sedimentation problems.

E. Maintain any surrounding wetlands which assist in sedimentation control and the renovation of nutrients and other pollutants.

F. Other techniques (chemical or non-chemical treatments) such as the use of herbicides, algicides or drawdown of water level during certain seasons, dredging or weed harvesting, as recommended and/or approved by the Department of Environmental Protection.

G. Strict enforcement of the Public Health Code requirements with respect to new construction in the Quassett Lake watershed. Of particular concern, will be the undeveloped areas throughout the northwestern and northern parts of the watershed. The presence of bedrock at or near ground surface, moderate to steep slopes and till-based soils will greatly limit the development potential in this part of the watershed. These limitations will weigh most heavily on the ability to provide adequate subsurface disposal.

H. Educating lakeside residents about the proper operation and maintenance of septic systems via an information pamphlet. The pamphlet should advise homeowners about the consequences of failures, list materials which should not be disposed of in a septic system, discuss water conservation measures, and stress the need for routine septic tank pumping. An excellent pamphlet for these purposes was developed by the Northeastern Connecticut Regional Planning Agency and the Northeast District Department of Health entitled, "Homeowner's Guide to Septic System Maintenance - Or How to Save Thousands of Dollars." (See Appendix)

I. Encouraging lakeside residents to use nonphosphate laundry detergents. The phosphorus passing through a residential septic system can be reduced 30 to 40 percent by the use of nonphosphate laundry detergents.

VIII. SOILS AND RELATED CONCERNS

The soils within the Quassett Lake Watershed are nearly level to steep, well-drained to poorly drained, loamy soils that have a compact substratum or hardpan. They are Woodbridge, Paxton and Ridgebury series soils which have developed from drumloidal glacial till uplands. The soils map within this report delineates soil units, for examply WyB, PbB. These soil units are described in this report. There are also minor areas of other soils within this watershed. Also included is a Limitation and Ratings chart for development uses of soils surrounding the Lake.

Of concern is the affect of these soil types on the Lake. The Woodbridge and Paxton soils on the hillsides of the Lake normally have a hardpan soil layer about 2 feet beneath the surface. This compact layer perches a seasonally high water table above it, and causes this water to move downslope toward the lake. In affect, the topsoil and subsoil above this hardpan becomes saturated. This means nutrients from septic leaching fields for example, are flushed toward the lake. Evaluation of lakes has shown that the greatest "pollution" threat to lakes is from residential land immediately adjacent to the lake.

Phosphorous is many times the nutrient causing a problem, promoting algae and weed growth. An acre of residential land will often contribute much more phosphorous to a lake than an acre of agricultural land or an acre of woodland in the same location. The steep slopes and soils around Quassett Lake most certainly introduce runoff and perched groundwater containing nutrients encouraging algae and weed growth. Actions in the DEP Watershed Management Guide for Connecticut Lakes and this report, should be taken to slow and minimize nutrient input.

Another concern is with sediment pollution of the Lake. Gross erosion and likely sediment pollution was observed with new construction on a steep slope off East Quassett Road. A building lot should not be disturbed like this. In September 1985 the Planning Commission will have enforceable Erosion and Sediment Control Regulations in effect. However, these will only affect subdivision development. The Quassett Lake District might consider the feasibility of enacting an Erosion and Sediment Control Ordinance to require adequate planning and implementation of needed measures to prevent lakeside sediment pollution. The Windham County Soil and Water Conservation District could offer assistance with this.

It is noteworthy that prime farmland soils are located within the watershed. These soils (CbB, PbB, WxA, WxB) provide the land that is best suited to producing crops with minimum treatment. Prime farmland soils retain adequate

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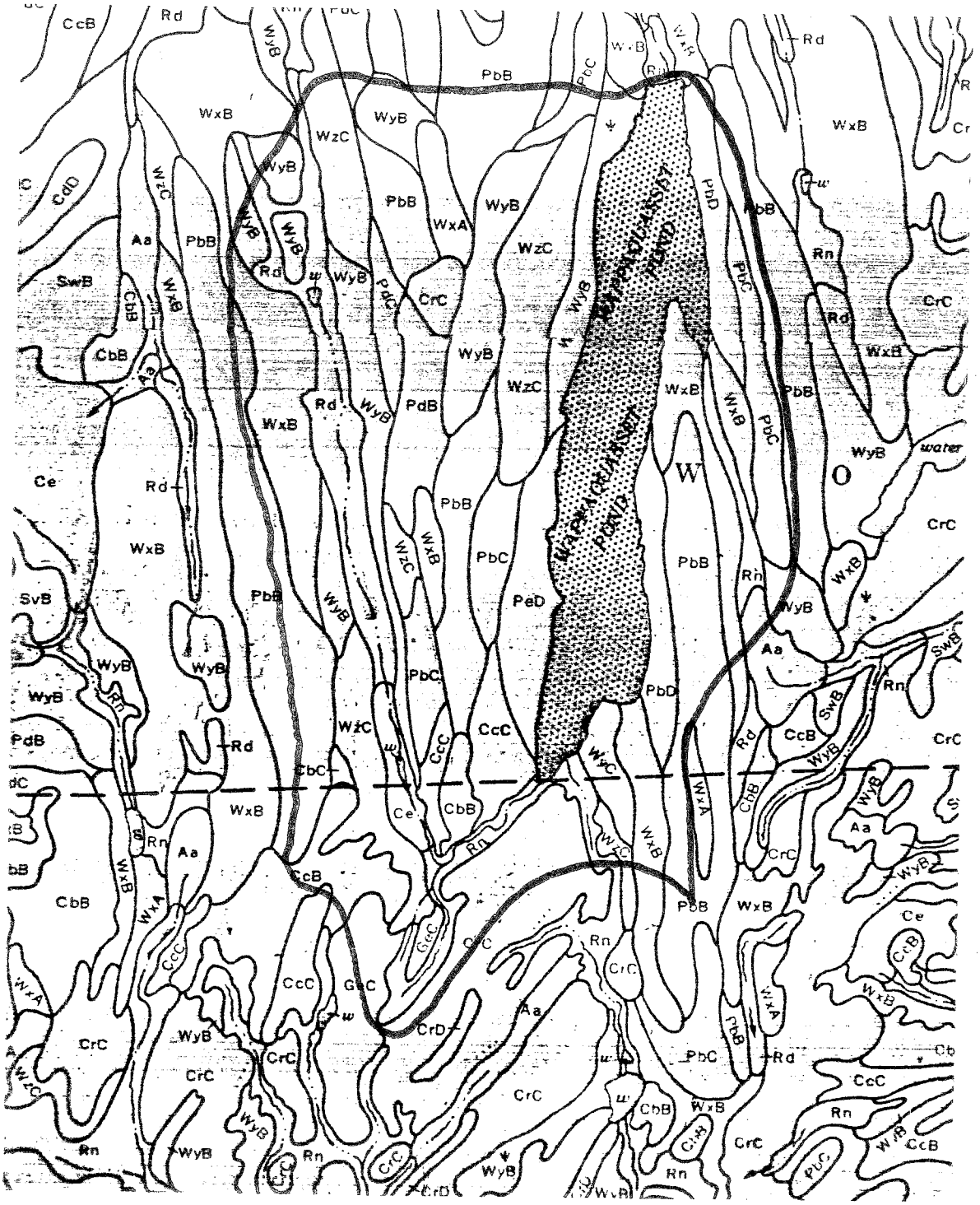
Assisting the Windham County Soil and Water Conservation District



SOILS MAP

Watershed Boundary

Scale 1" = 1320'

moisture, have favorable temperatures and few rocks, and are not excessively erodible. The soils map will show that dwellings are already built on many of these soils on the east side of the Lake.

IX. VEGETATION

The approximately 660 acre Quassett Lake watershed may be divided into six vegetation cover types. In addition to the 481.5 acres occupied by these types, built up residential areas occupy 78.5 acres. Quassett Lake (Wappaquassett Pond) covers 100 acres. Water covers an additional one acre in the form of two small ponds.

General Vegetation Types

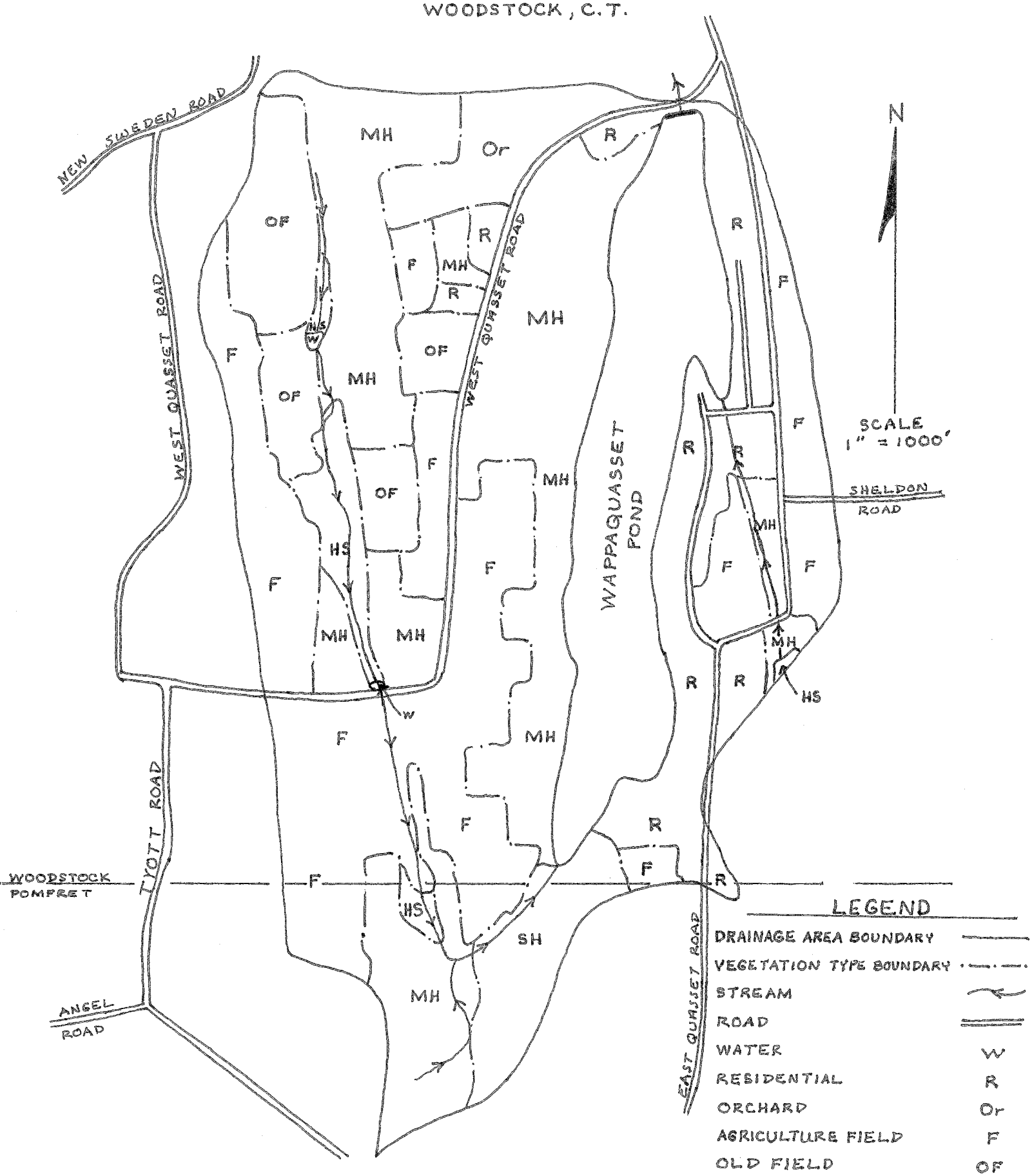
Mixed Hardwoods (184 acres). The mixed hardwoods type is composed of 60% or more hardwoods and not over 40% of softwoods. The hardwoods are the so-called Connecticut hardwoods, white, red, black, scarlet and chestnut oaks, white ash, hickory, beech, birch and maple. Softwoods will be either white pine or hemlock. The understory contains hardwood tree seedlings and saplings, along with many shrub species, including blue beech, hazelnut, mountain laurel and flowering dogwood. Ground cover is dominated by mosses, grasses and fern.

Many of the tree species which are present in the mixed hardwoods type have high commercial value for sawtimber and fuelwood. The condition of the trees is quite variable, as dictated by site conditions, past land use and past vegetation management. The high productivity potential of certain areas can be increased significantly through proper forest management. Trees in these areas will respond well to periodic thinnings aimed at removing the poor quality trees. These thinnings will reduce competition between desirable species and result in a healthier, high quality stand. Management should be primarily for the hardwoods.

Softwoods - Hardwoods (24 acres). The softwoods-hardwoods type is one composed of any combination of percentages from 60% softwoods and 40% hardwoods to 40% softwoods and 60% hardwoods. White pine, hemlock, oaks, white ash, hickory, birch, beech and maple in combinations are the usual species occurring in this type. Softwood and hardwood tree seedlings and saplings, mountain laurel, lowbush blueberry and huckleberry are the most abundant vegetation forms in the understory. Ground cover consists of mosses, ferns and grasses.

The tree species present in this type also have commercial value. However, due to site conditions, the hardwoods may be of lower quality than those in the mixed hardwood type. Management should be for a mixed stand.

VEGETATION
QUASSETT LAKE E.R.T.
WOODSTOCK, C.T.



Hardwood Swamp (17.5 acres). The hardwood swamp type is composed of at least 60% hardwoods and not over 40% softwoods. The type is usually composed of red maple with elm, black ash, white ash, yellow birch and black gum. The softwood, when it occurs, is usually hemlock. The understories throughout these areas vary widely in both species composition and diversity. Highbush blueberry, spicebush, sweet pepperbush and several species of viburnum are common throughout. Skunk cabbage, tussock sedge, cinnamon fern, sensitive fern and sphegnum moss are widespread as ground cover.

The commercial utility of the trees in these areas must be made on an individual area basis. Generally, tree growth potential is somewhat limited by the high water table and the saturated soils which are present. Under these conditions, trees are shallow rooted and unable to become securely anchored, causing a high potential for windthrow. These soil conditions also limit access and operability. Depending on the severity of these limitations, the feasibility of implementing timber management practices may be severely reduced or eliminated completely.

Old Field (53 acres). The old field type is largely grey birch, red cedar or both, bird cherry or scattered other trees and brush species such as alder, laurel, hardtack, etc. It is in reality a temporary type composed of relatively worthless growth. It is always abandoned pasture, mowing or farmland which is reverting to a poor hardwood stand.

Eventually, these areas will become commercial forestland as stocking of desirable tree species increases. Planting softwoods such as white pine, Norway spruce or larch in the openings will shorten the time needed for these areas to become fully stocked.

Agricultural Field (181 acres). This type is farm or pasture land which is still in active use or has not yet become covered with tree growth.

Orchard (23 acres). This type is composed of actively managed commercial fruit orchards.

Limitations to Forest Management

Some areas of this watershed may present limitations to forest management. These limitations may be divided into two major categories: (1) those that restrict operability as related to forest management, and (2) those that restrict tree growth.

Operability related to forest management may be limited by poor access, proximity to a residential development, extremely steep slopes and/or severe rockiness. These obstacles may restrict or even preclude the actual implementation of forest management practices.

Included in the second form of limitation are excessively well drained soils, shallow to bedrock soils and wetland soils. These soils may limit or restrict tree growth, quality and health to a point where the trees that are present have little or no commercial value.

It should be recognized that the limitations described above may not preclude forest management. However, proper planning and implementation is essential in these areas to insure effective, efficient and environmentally sound operations.

Management Considerations

The Department of Environmental Protection's Bureau of Forestry encourages all woodland owners to manage thier forestlands. When properly prescribed and executed, forest management practices will increase the production of forest products, improve wildlife habitat and enhance the overall condition of the woodland with minimal environmental impact.

To reach a healthy and productive state, individual forest stands should be periodically evaluated to determine present and future management needs. A public service forester from the Department of Environmental Protection may be contacted to provide basic advice and technical assistance in forest management. These services are provided free of charge. SErvices of a more intensive nature are available from private consulting foresters.

Effects of Forest Management on Water Quality

Healthy woodlands provide a protective influence on water quality: (1) they stabilize soils, (2) reduce the impact of precipitation and runoff, and (3) moderate the effects of adverse weather conditions. By so doing, woodlands help reduce erosion, sedimentation, siltation and flooding. Research has shown that soil protected by a cover of humas and litter associated with woodland areas contributes little or no sediment to streams.

Improper cultivation and harvesting of timber for commercial purposes may, however, lower water quality in several says: (1) erosion, siltation and sedimentation covered by improperly located and constructed access roads, skid trails, yarding areas and stream crossings; (2) siltation and sedimentation caused by logging debris left in streams, impeding natural flow; (3) thermal pollution resulting from complete removal of streambank vegetation, eliminating shade; and (4) chemical pollution caused by improper application of herbicides and insecticides. (It should be noted that in Connecticut, widespread use of chemicals in forest management is not prevalent and, therefore, does not constitute a great threat to water quality at this time.)

Despite the potential adverse impacts to water quality, the harvesting of trees is a major and necessary tool used in forest management. Adverse impacts to water quality can be minimized through good planning and responsible implementation.

A pamphlet entitled "Logging and Water Quality in Connecticut: A Practical Guide for Protecting Water Quality While Harvesting Forest Products" was published in 1982 and is available from the Department of Environmental Protection, Bureau of Forestry (566-5348). A series of Best Management Practices (BMPs) which are recommendations designed to minimize the negative impact of

silvicultural activities on water quality are presented in this pamphlet. A "BMP" is defined in the pamphlet as "a practical, economical and effective management or control practice which will reduce or prevent the generation of pollution." Following these BMP's along with the use of common sense, will help avoid water quality degradation resulting from silvicultural operations.

The implementation of the recommended BMP's is of a voluntary nature, rather than through regulation. Local regulation of forest product harvesting would be undesirable due to the possibility of the creation of 169 different regulations.

Education programs may be reinforced by the use of timber sales contracts between landowners and loggers which reflect the use of BMP's. A public or private forester can assist landowners in developing an effective timber sales contract. The posting of reasonable performance bonds by loggers may be necessary to insure proper completion of logging operations. Periodic on-site inspections may also be necessary to see that harvest activities meet the contract terms. Education of the landowners and loggers will be the key to successful use of BMP's in timber harvesting.

X. FISH RESOURCES

Wappaquassett Pond is a typical warm-water Connecticut pond. The pond was surveyed in 1955. Results of the survey are included in the "A Fishery Survey of Connecticut Lakes and Ponds," commonly referred to as the "Blue Book." The 1955 survey determined that chain pickerel, common sunfish, brown bullhead and golden shiners inhabit the pond. Local residents report that good populations of largemouth bass and calico bass (black crappie) have developed since the last survey.

The Lake District has stocked the pond with trout in recent years. Local residents report that a few of these were caught shortly after stocking but no holdover trout were ever caught. Wappaquassett is not suited for trout management due to the warm water temperature from top to bottom, the abundance of resident fishes known to compete and/or prey on trout, and the failure of previous stockings.

Wappaquassett Pond is best suited for warm-water fish management. The present composition of fish species is ideal for this shallow eutrophic waterbody. Adequate spawning areas exist to maintain current fish populations. Periodic drawdowns for shorefront maintenance and/or weed control may help to prevent panfish from becoming overabundant and stunted by forcing them into a more confined area where they are more available to predator species.

In summary, the current fish populations are ideal for Wappaquassett. There is presently no need for altering the existing habitat or fish populations to maintain good sport fishing in the pond.

XI. PLANNING CONCERNS

Quassett Lake has no regional significance primarily because it is a private lake. Access to and use of the lake is restricted to members of the Quassett Lake Association. At the present time, there is no indication that the Association plans to open the lake to nonmembers.

The lake seems to be showing signs of some eutrophication. Although some of this may be natural, the 1959 Fish and Game ponds guide stated that there were few submerged or emergent weeds. Now, however, emergent pond lilies are seen over much of the upper pond. Much of the cause of this deterioration must have been the building of cottages, often adjacent to the pond's shore, on small lots on the eastern shore. Coupled with steep slopes and soils containing a hardpan, infiltration of nutrients into the pond is to be expected.

Other factors include the small size of the watershed area (approximately 1 square mile); the apparent pressure to develop the remainder of the watershed, presumably with on-site sewage disposal; and the current use of a good portion of the watershed for agricultural purposes.

Several actions are recommended to avoid problems in the future from these sources. These actions are as follows:

1. Encourage careful septic system management. Steps to take to prevent premature failure are given in "Homeowner's Guide to Septic System Maintenance," available from the Northeastern Connecticut Regional Planning Agency (or see the Appendix).

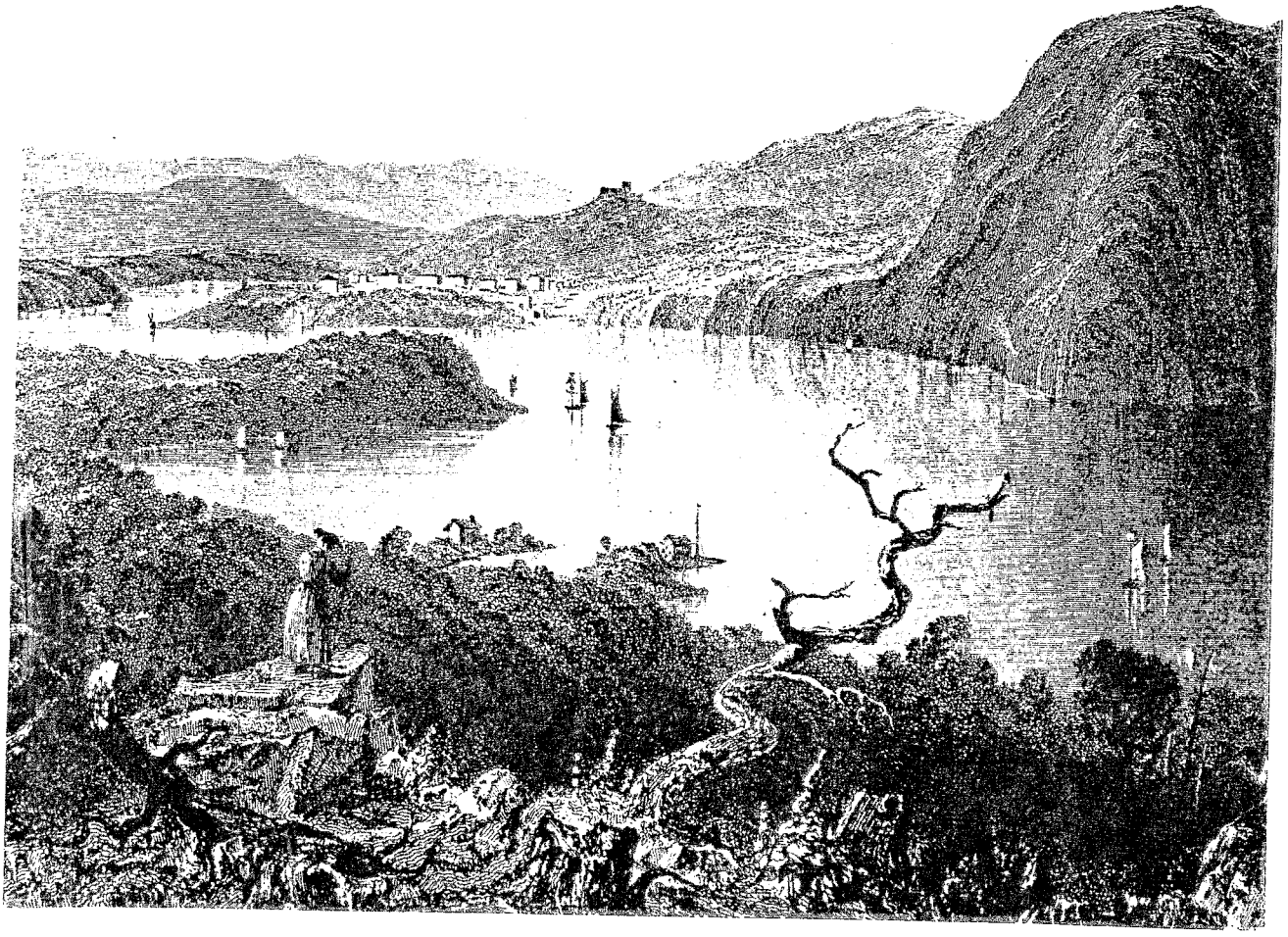
2. Carefully regulate, if possible, future development in the watershed. Require or encourage large lot size and residential uses to avoid future potential pollution problems which are associated with some commercial and industrial uses.

3. Encourage the use of Best Management Practices on all active agricultural lands. This would serve to minimize runoff, sedimentation and erosion and improper application of fertilizers and pesticides.

4. Encourage proper use of sedimentation and erosion controls for all new development within the watershed.

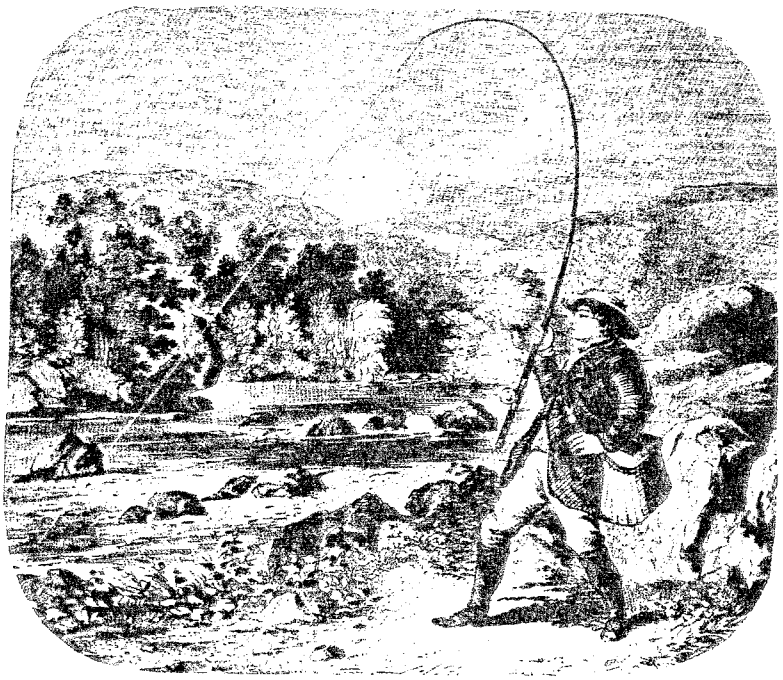
5. Preserve the existing wetlands in the watershed, in part, to serve as a "natural treatment plant" for organic pollutants which may be released upgradient from them.

The fact that the Town of Woodstock has no land use controls other than their Subdivision Regulations makes it more difficult to regulate the uses, development and management practices within the watershed, especially for the area within the watershed but outside the Quassett Lake Association District. As more of these types of problems arise in Woodstock, the Town will have to address the need for land use controls.



XII. SUMMARY

Quassett Lake is in the mesotrophic stage of eutrophication. This is the second stage in the natural aging process of a waterbody. This process is being accelerated by the activities of man which increase the nutrient and sediment inputs to a waterbody. Any additional residential or agricultural development which do not employ best management practices will worsen the condition of the lake. Local agencies and the Lake District Association should consider developing a watershed management plan to lessen the effects of land use changes in the watershed. Also, by following specific steps and guidelines, the sanitary quality of the lake may be improved and protected. Weed growth may be controlled by several methods if it interferes with the recreational or aesthetic quality of the lake. It is recommended that this report be read in its entirety by Town officials and members of the Lake District so that it may be used as a guide on issues surrounding the lake area.



Appendix

United States Department of Agriculture
Soil Conservation Service
Agricultural Center
Brooklyn, CT 06234-0327
774-0224

Watershed Soils at Quassett Lake

*Aa - Adrian & Palms mucks
*Ce - Carlisle muck
*Rd - Ridgebury fine sandy loam
*Rn - Ridgebury, Leicester & Whitman extremely stony fine sandy loams

#CbB - Canton & Charlton fine sandy loams, 3 to 8 percent slopes
CbC - " " " " " , 8 to 15 percent slopes
CcB - Canton & Charlton very stony fine sandy loams, 3 to 8 percent slopes
CcC - " " " " " " " , 8 to 15 percent slopes

CrC - Charlton-Hollis fine sandy loams, very rocky, 3 to 15 percent slopes

GeC - Gloucester extremely stony sandy loam, 3 to 15 percent slopes

#PbB - Paxton fine sandy loam, 3 to 8 percent slopes
PbC - " " " " , 8 to 15 percent slopes
PbD - " " " " , 15 to 25 percent slopes
PdB - Paxton very stony fine sandy loam, 3 to 8 percent slopes
PdC - " " " " " " , 8 to 15 percent slopes
PeD - Paxton extremely stony fine sandy loam, 15 to 35 percent slopes

#WxA - Woodbridge fine sandy loam, 0 to 3 percent slopes
#WxB - " " " " , 3 to 8 percent slopes
WyB - Woodbridge very stony fine sandy loam, 3 to 8 percent slopes
WyC - " " " " " " , 8 to 15 percent slopes
WzC - Woodbridge extremely stony fine sandy loam, 3 to 15 percent slopes

* Designated wetland soil by Public Act 155
# Prime farmland soil

The Soil Conservation Service is an agency of the United States Department of Agriculture

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☆ U.S. Government Printing Office: 1983—420-939/1578

Quassett Lake Watershed

Woodstock, Conn.

Principal Limitations and Ratings of Soils for: Residential Development

SOIL MAP SYMBOL AND SOIL NAME	SEPTIC TANK ABSORPTION FIELDS	DWELLINGS WITHOUT BASEMENTS	DWELLINGS WITH BASEMENTS	LOCAL ROADS AND STREETS	LAWNS AND LANDSCAPING
*Aa - Adrian	Severe-ponding, poor filter	Severe-ponding,low strength	Severe-ponding	Severe-ponding, low strength, frost action	Severe-ponding, excess humus
Palms	Severe-subsides, ponding	Severe-ponding,low strength	Severe-ponding, low strength	Severe-ponding, frost action, subsides	Severe-ponding. excess humus
*Ce - Carlisle	Severe-ponding, percs slowly	Severe-ponding,low strength	Severe-ponding, low strength	Severe-ponding, frost action, subsides	Severe-ponding, excess humus
*Rd - Ridgebury	Severe-percs slowly,wetness	Severe-wetness	Severe-wetness	Severe-wetness, frost action	Severe-wetness
*Rn - Ridgebury	Severe-percs slowly,wetness	Severe-wetness	Severe-wetness	Severe-wetness, frost action	Severe-wetness
Leicester	Severe-wetness	Severe-wetness	Severe-wetness	Severe-wetness, frost action	Severe-wetness
Whitman	Severe-percs slowly,ponding	Severe-ponding	Severe-ponding	Severe-frost action,ponding	Severe-large stones,ponding
#CbB - Canton	Severe-poor filter	Slight	Slight	Slight	Slight
Charlton	Slight	Slight	Slight	Slight	Slight
CbC - Canton	Severe-poor filter	Moderate-slope	Moderate-slope	Moderate-slope	Moderate-slope
Charlton	Moderate-slope	Moderate-slope	Moderate-slope	Moderate-slope	Moderate-slope

Quassett Lake Watershed

Woodstock, Conn.

Principal Limitations and Ratings of Soils for: Residential Development

SOIL MAP SYMBOL AND SOIL NAME	SEPTIC TANK ABSORPTION FIELDS	DWELLINGS WITHOUT BASEMENTS	DWELLINGS WITH BASEMENTS	LOCAL ROADS AND STREETS	LAWNS AND LANDSCAPING
CaB - Canton	Severe	Slight	Slight	Slight	Moderate-large stones
Charlton	Slight	Slight	Slight	Slight	Moderate-large stones
CcC - Canton	Severe	Moderate-slope	Moderate-slope	Moderate-slope	Moderate-large stones,slope
Charlton	Moderate-slope	Moderate-slope	Moderate-slope	Moderate-slope	Moderate-large stones,slope
CrC - Charlton	Moderate-slope	Moderate-slope	Moderate-slope	Moderate-slope	Moderate-large stones,slope
Hollis	Severe-depth to rock	Severe-depth to rock	Severe-depth to rock	Severe-depth to rock	Severe-thin layer
GeC - Gloucester	Severe-poor filter	Moderate-large stones,slope	Moderate-large stones,slope	Moderate-slope, large stones	Moderate-slope, small stones, droughty
#PbB - Paxton	Severe-percs slowly	Moderate-wetness	Moderate-wetness	Moderate-wetness,frost action	Slight
PbC - Paxton	Severe-percs slowly	Moderate-wetness, slope	Moderate-wetness, slope	Moderate-wetness, slope,frost action	Moderate-slope
PbD - Paxton	Severe-percs slowly	Severe-slope	Severe-slope	Severe-slope	Severe-slope
PdB - Paxton	Severe-percs slowly	Moderate-wetness	Moderate-wetness	Moderate-wetness, frost action	Moderate-large stpmes

Quassett Lake Watershed

Woodstock, Conn.

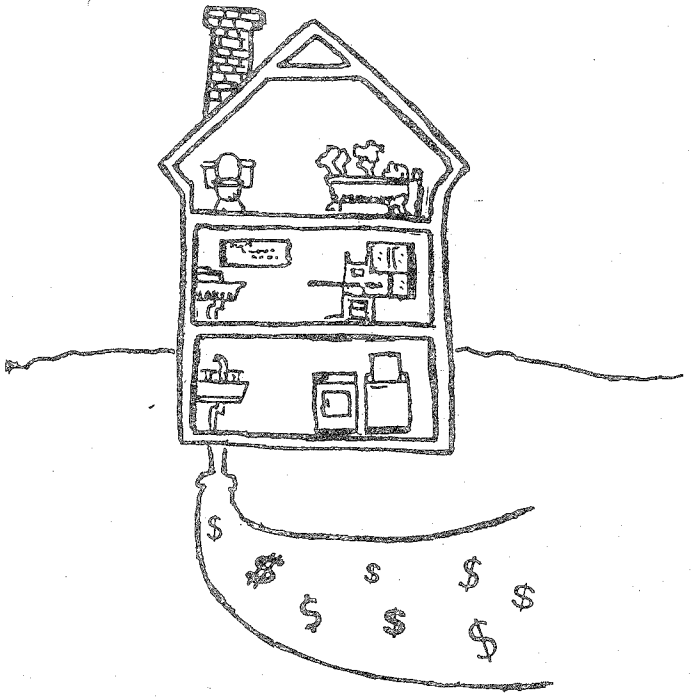
Principal Limitations and Ratings of Soils for: Residential Development

SOIL MAP SYMBOL AND SOIL NAME	SEPTIC TANK ABSORPTION FIELDS	DWELLINGS WITHOUT BASEMENTS	DWELLINGS WITH BASEMENTS	LOCAL ROADS AND STREETS	LAWNS AND LANDSCAPING
PdC - Paxton	Severe-percs slowly	Moderate-wetness, slope	Moderate-wetness, slope	Moderate-wetness, slope, frost action	Moderate-large stones.slope
PeD - Paxton	Severe-percs slowly, slope	Severe-slope	Severe-slope	Severe-slope	Severe-slope
#WxA -Woodbridge	Severe-wetness, percs slowly	Moderate-wetness	Severe-wetness	Severe-frost action	Moderate-wetness
#WxB-Woodbridge	Severe-wetness, percs slowly	Moderate-wetness	Severe-wetness	Severe-frost action	Moderate-wetness
WyB -Woodbridge	Severe-wetness, percs slowly	Moderate-wetness	Severe-wetness	Severe-frost action	Moderate-large stones, wetness
WyC -Woodbridge	Severe-wetness, percs slowly	Moderate-wetness, slope	Severe-wetness	Severe-frost action	Moderate-large stones, wetness, slope
WzC -Woodbridge	Severe-wetness percs slowly	Moderate-wetness, slope	Severe-wetness	Severe-frost action	Moderate-large stones, wetness, slope

*Designated wetland soil by Public Act 155

#Prime farmland soil

HOMEOWNER'S GUIDE TO SEPTIC SYSTEM MAINTENANCE



(or how to save thousands of dollars)

A new septic system costs about $1,500-$2,000 to install. If it is not taken care of properly, it will become clogged and will either back up into the building or come out on the surface of the ground. When a septic tank is ignored, solids accumulate excessively and finally flow out of the tank into the pipes of the underground leaching system. Gradually the seepage holes in the pipes, and the surrounding earth, become clogged and no longer function. Rebuilding or replacing the system is a major expense and an inconvenience. *System failure is expensive.* It is easier to *prevent* than it is to *correct.* By keeping harmful materials out of the system, and by having the septic tank pumped out regularly (at least every three years), the homeowner can help protect his system against premature failure. The $35-60 cost of having the tank pumped is cheap insurance to protect an investment worth $1,500-$2,000 (or more).

Septic system failure can also be costly to you as a taxpayer. As septic systems fail throughout the town, the streams and rivers become polluted and surfacing sewage becomes a public health nuisance. It will be the responsibility of the Town of Woodstock to correct such pollution problems, and extremely costly sewer and treatment systems will be required. Add to this the fact that the federal government will not kick in 90% of the costs of the sewers, and the prospect becomes awesome indeed - sewer hookups could very realistically cost a homeowner $10,000!

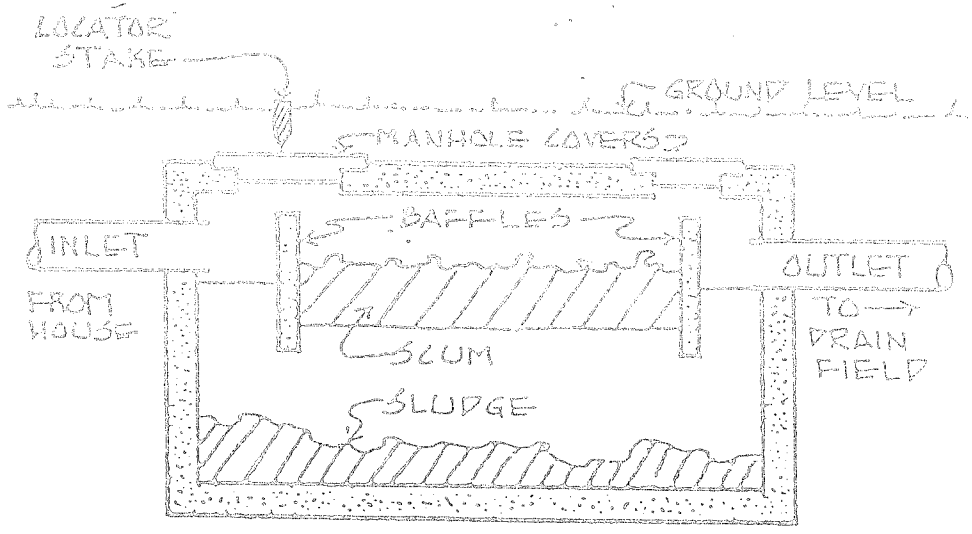
Septic Tank Pumping

Septic tanks must be pumped out by contractors licensed by the State of Connecticut. You should make certain that the person providing this service has a current license. A list of operators licensed to work in your community is included in this booklet.

While your tank is being pumped out, ask the operator to inspect the inlet and outlet baffles. If either is broken, it should be repaired *immediately*. Failure to repair a broken baffle may result in failure of the septic system. The inlet should also be checked to see if wastewater is continuously flowing into the tank from previously undetected plumbing leaks.

It is not necessary to leave any of the sludge in the tank as a "seed." Incoming sewage contains all the bacteria needed for proper operation of the septic tank. The use of acids or bleaches to clean the tank is not recommended as a part of normal maintenance.

The use of enzymes and other "miracle" septic system additives has not been shown to be of any value. While their use may not harm your system, they do not take the place of regular pumping. Furthermore, some of these materials can cause chemical contamination of the groundwater and ultimately contaminate your well. Contamination of this type has occurred in Connecticut, and you are strongly advised not to use chemical additives to make your sewage disposal system work!



Septic Tank
CROSS SECTION

If solids are allowed to reach the level of the outlet pipe, the system acquires a high probability of future failure.

PREVENTING SYSTEM FAILURE

To help protect a septic system against premature failure, the homeowner should follow these simple procedures:

1. Have your tank pumped at least every three years. Do not wait until the symptoms of failure show up; it will be too late to prevent failure!

2. Minimize water use in the home. Excess water will decrease the effectiveness of the septic tank and lead to flooding of the leaching area. Never empty basement sumps or other sources of clear water into the septic system. Run dishwashers and washing machines with full loads only. Fix leaky faucets and toilets promptly.

3. Do not dispose of large quantities of the following materials into the septic system: vegetable trimmings, ground garbage, sanitary napkins, coffee grounds, fats, greases, acids, disinfectants, medicines, paint, paint thinner or other chemicals. These materials may adversely affect the functioning of the sewage disposal system or cause complete failure. Please dispose of these and other materials in an environmentally safe manner.

4. Do not plant deep-rooted trees or bushes over the leaching area. Their roots may clog pipes.

5. Do not discharge salt brine backflush solution from water softeners into the septic system. The discharge of water softener backwash into the septic system is a violation of the Public Health Code and may result in contamination of wells with salt.

SUGGESTIONS FOR MAXIMIZING THE SERVICE OF A SUBSURFACE SEWAGE DISPOSAL SYSTEM

1. Have the septic tank pumped, unless it is known to have been pumped within the past few years. The previous owner may have knowledge of the location and size of the septic tank. If so, be sure to record this information.

2. If you know the size of the tank, you may call two or three pumping contractors for competitive bids. If the size of the tank is not known, be sure to ask the contractor the size (in gallons) once it has been pumped.

3. If the exact location of the tank is not known, when the tank is pumped, measure the distance to the clean-out hole of the tank to two points on the house. This procedure will allow you to easily locate the tank for inspection and pumping thereafter.

4. If the septic tank is undersized (relative to the expected water use) and/or significantly less than 1,000 gallons, it should be replaced or pumped routinely to prevent solids in the tank from entering the leaching system.

5. Ask the contractor about the condition of the tank baffles. If one or both baffles are broken or missing, replace the tank or baffles as soon as possible.

6. If the clean-out for the septic tank is deep in the ground, a small diameter tile pipe may be installed and extended close to surface grade for easy access. This procedure will facilitate inspection and pumping.

(This document has been primarily excerpted from a publication of the Northeast District Department of Health, entitled, "Homeowners Guide." Publication of this leaflet was provided by the Northeastern Connecticut Regional Planning Agency under an EPA grant for a septic system management program. This program is being sponsored by the Woodstock Board of Selectmen and the Woodstock Conservation Commission.)

LICENSED SEPTIC TANK CLEANERS IN NORTHEASTERN CONNECTICUT

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About The Team

The Eastern Connecticut Environmental Review Team (ERT) is a group of professionals in environmental fields drawn together from a variety of federal, state, and regional agencies. Specialists on the Team include geologists, biologists, foresters, climatologists, soil scientists, landscape architects, archeologists, recreation specialists, engineers and planners. The ERT operates with state funding under the supervision of the Eastern Connecticut Resource Conservation and Development (RC&D) Area--an 86 town area.

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

PURPOSE OF THE TEAM

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

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

REQUESTING A REVIEW

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

For additional information regarding the Environmental Review Team, please contact Elaine A. Sych (774-1253), Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, P.O. Box 198, Brooklyn, Connecticut 06234.