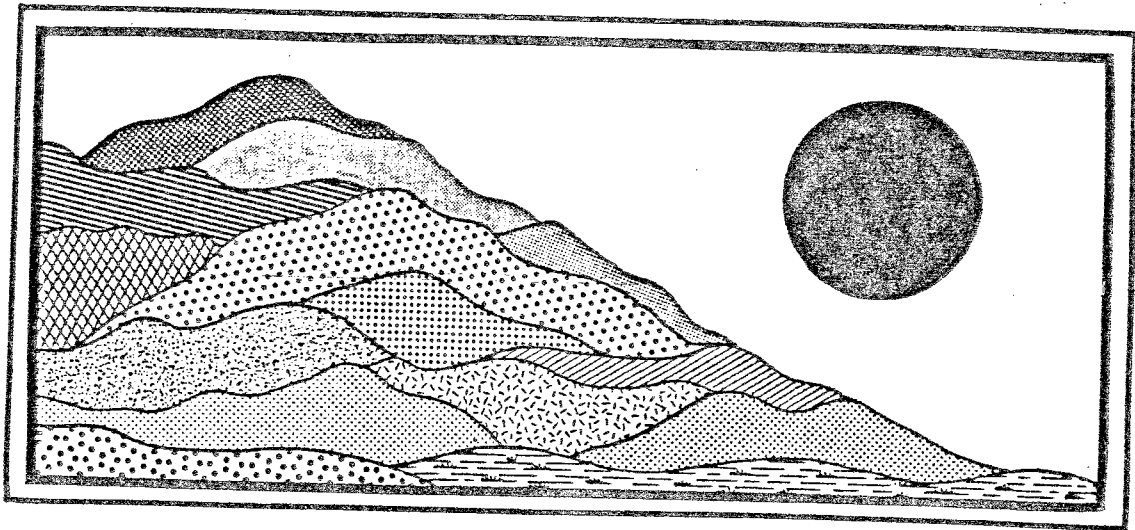


HUBBARD ESTATES

MIDDLETOWN, CONNECTICUT

JULY 1987



ENVIRONMENTAL

REVIEW TEAM

REPORT

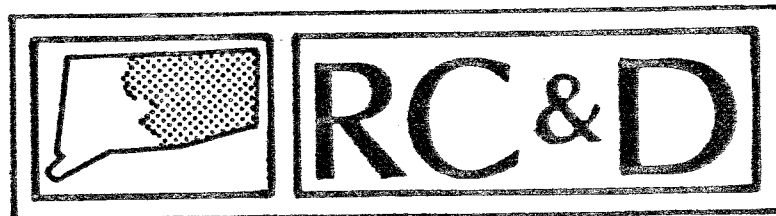
EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

HUBBARD ESTATES

MIDDLETOWN, CONNECTICUT

Review Date: MAY 26, 1987

Report Date: JULY 1987



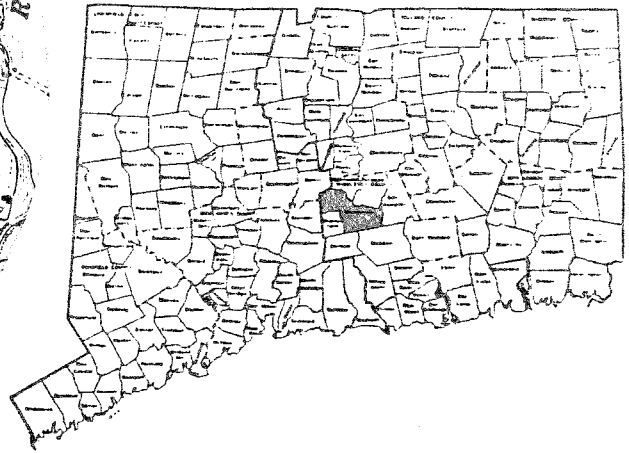
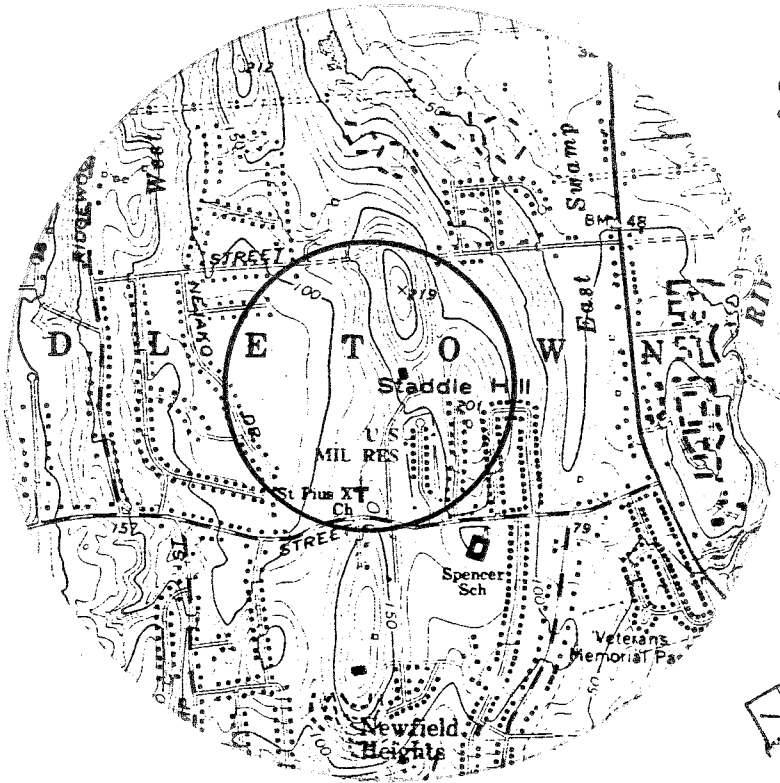
ENVIRONMENTAL REVIEW TEAM

PO BOX 198

BROOKLYN, CONNECTICUT 06234

Site Location

HUBBARD ESTATE SUBDIVISION
MIDDLETOWN, CONNECTICUT



EASTERN CONNECTICUT

RESOURCE CONSERVATION

& DEVELOPMENT AREA

ENVIRONMENTAL REVIEW TEAM REPORT

ON

THE HUBBARD ESTATE SUBDIVISION

Middletown, Connecticut

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

The ERT met and field checked the site on Tuesday, May 26, 1987. Team members participating on this review included:

Pat Leavenworth	--District Conservationist U.S.D.A., Soil Conservation Service
Cathy Rogalsky	--Regional Planner - Midstate Regional Planning Agency
Elaine Sych	--ERT Coordinator - Eastern Connecticut RC&D Area
Bill Warzecha	--Geologist - DEP, Natural Resources Center

Prior to the review day, each team member received a summary of the proposed project, a list of the Town's concerns, a location map, topographic map and a soils map. During the field review the team members were given subdivision plans, a traffic study, and a drainage study. The Team met with, and were accompanied by the Middletown Planning Director and Planner, the Zoning and Wetlands Officer, personnel from the Municipal Development Office and the engineer for the project. 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 on a proposed project-- all final decisions and conclusions rest with the Town and landowner.

This report identifies the existing resource base and evaluates its significance to the proposed development, and also suggests considerations that should be of concern to the developer and the Town. The results of this Team action are oriented toward the development of better environmental quality and the long-term economics of land use.

The Eastern Connecticut RC&D Executive Committee hopes you will find this report of value and assistance in making your decisions on this proposed subdivision.

If you require any additional information, please contact:

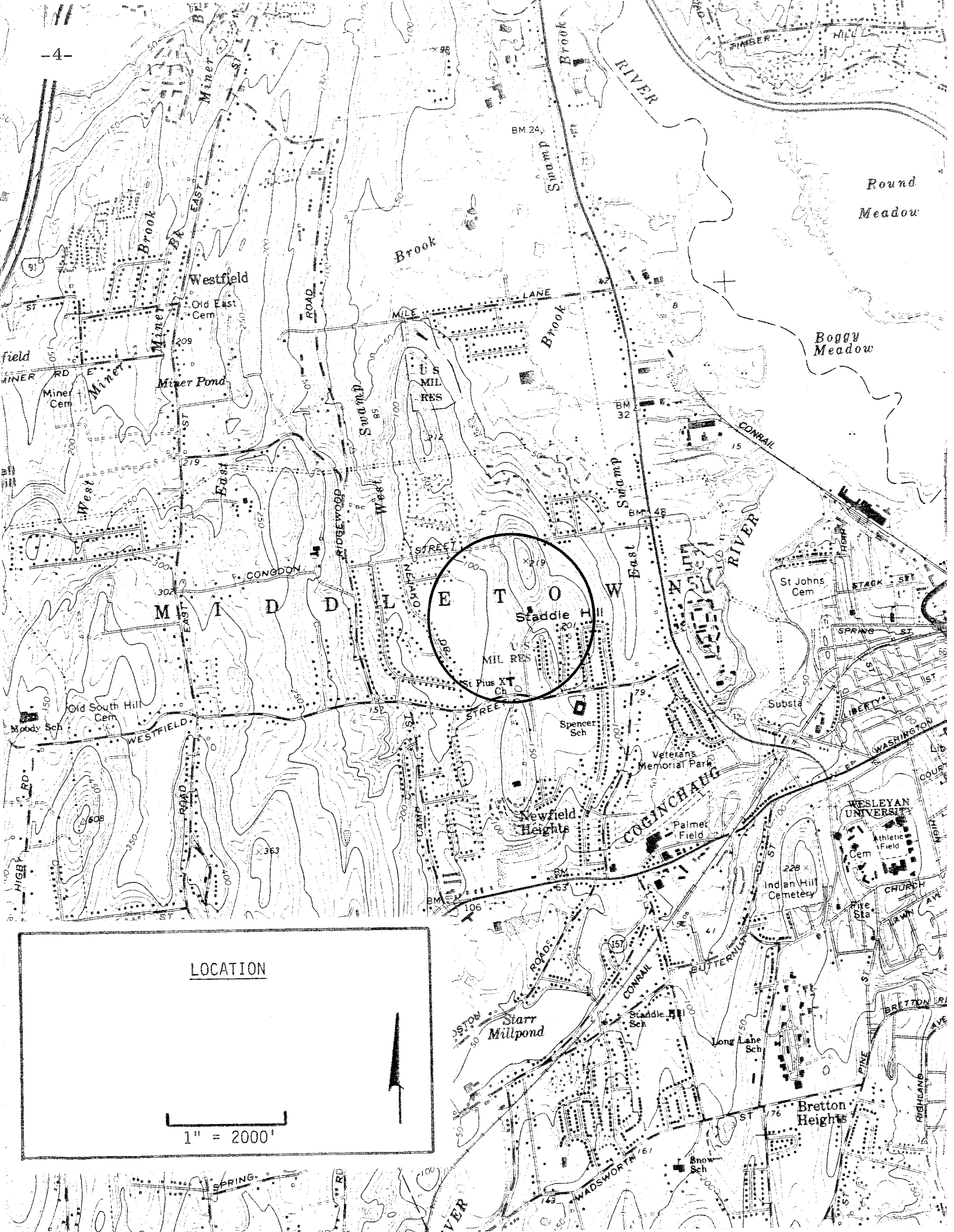
Elaine A. Sych
ERT Coordinator
Eastern Connecticut RC&D Area
P. O. Box 198
Brooklyn, CT 06234
(203) 774-1253

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LOCATION

1" = 2000'

1. INTRODUCTION

The Eastern Connecticut Environmental Review Team has been asked to conduct an environmental review of a proposed subdivision known as Hubbard Estates.

The site approximately 84 acres in size is located on the north side of Westfield Street. Eighty-six (86) lots are proposed which will be served by city sewer and water.

The major concerns of the City are all related to storm water drainage. The following sections of this report provide information and recommendations concerning this issue and other related concerns. A brief summary is included to highlight the ERT's major concerns and recommendations.

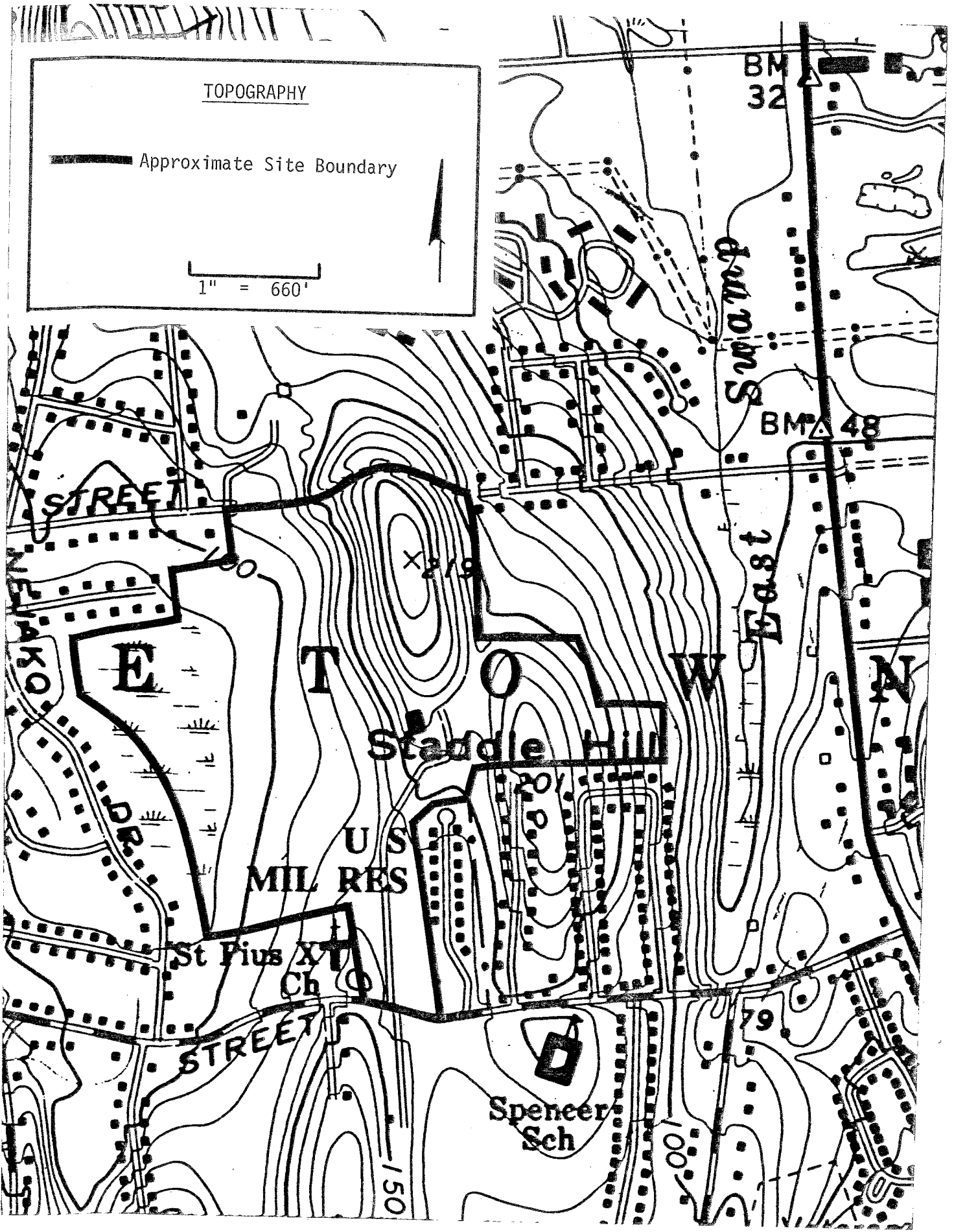
2. TOPOGRAPHY AND GEOLOGY

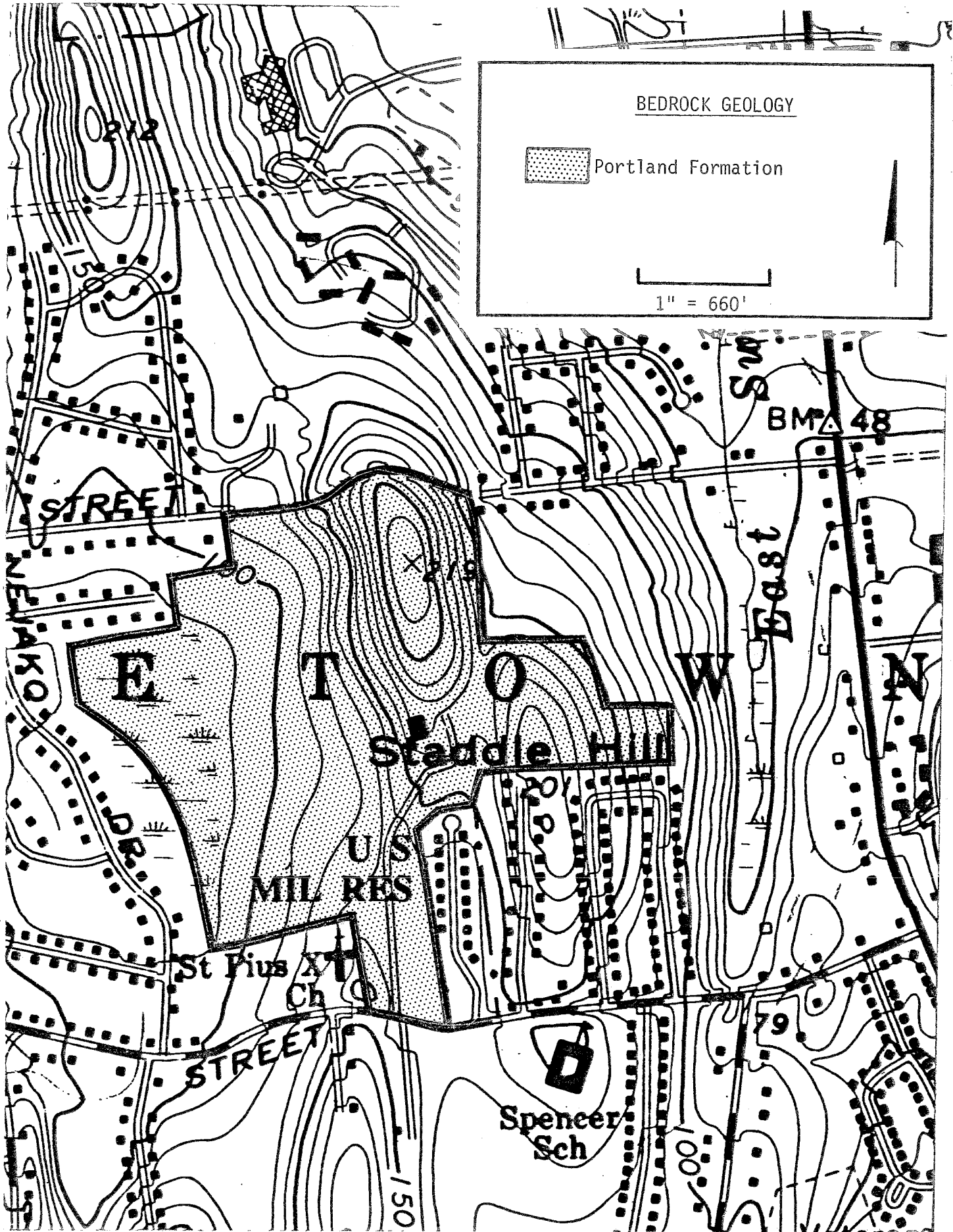
The proposed Hubbard Estate subdivision is located in the northcentral part of Middletown. Main access to the proposed + 84 acre residential subdivision is on the north side of Westfield Street. According to present plans, the subdivision will ultimately be accessed via Congdon Street to the west and the Spring Brook subdivision property to the east.

Most of the site is located on Staddle Hill. Staddle Hill is a geologic feature known as a drumlin; a streamlined hill composed predominantly of a glacial sediment known as till. It takes the shape of an inverted teaspoon. The till consists of ground-up rock fragments and particles which were plastered by moving glacial ice onto the underlying bedrock. Because of this mode of deposition, a relatively shallow "hardpan" layer is present two (2) to three (3) feet below ground surface. This "hardpan" zone is located beneath the weathered and rooted surficial soil zone. The till on the site is quite thick, perhaps forty (40) feet or more.

According to plans submitted to team members, regulated wetland soils have been flagged on the site by a certified soil scientist and the boundaries superimposed onto the subdivision plan. These soils represent about twenty-five percent (25%) of the site. They are located mainly in the western parts.

The bedrock geology of the site is described by E.P. Lehmann (Map QR-8, Geologic Map of the Middletown Quadrangle Connecticut, 1955). Lehmann identifies the underlying bedrock as Portland





BEDROCK GEOLOGY



Portland Formation



1" = 660'



STREET

NEW YORK

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W

N

Staddle Hill

U.S. MIL RES

St Pius Ch

STREET

Spence Sch

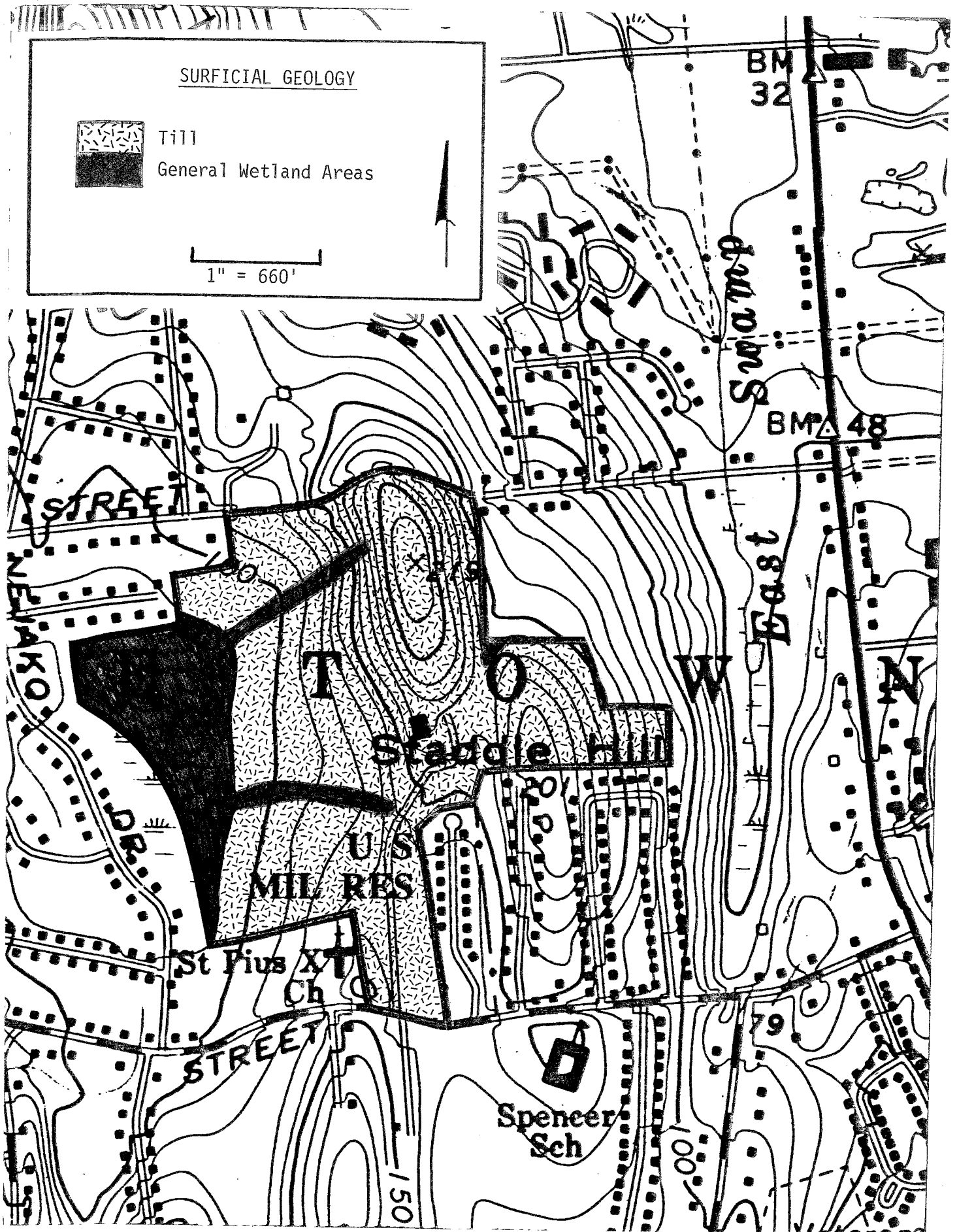
BMA 48

Sw

East

150

100



Formation. It is described as a reddish-brown arkose (brownstone). The term "arkose" refers to a red to brown, medium to coarse grained sandstone-like sedimentary rock containing quartz, feldspar, and rock fragments. The bedding in the rock dips gently to the east.

Based on available mapping the bedrock surface is relatively deep throughout the site. As a result, it should pose little or no problem with regard to residential development of the site. If bedrock is encountered, the relatively soft sandstone should yield easily to heavy equipment.

The geology of the site should pose no difficult obstacles to development particularly with the availability of public water and sewers. Seasonally high groundwater tables may affect the sloping areas of the site. Wet seeps were observed on the slopes in the western parts during the field walk. As a result, it is recommended that building footing drains be installed and properly outletted where needed. This will hopefully reduce the chance for wet basements.

Permanent wetness (wetland soils) will limit the usefulness of several lots in the western parts. Moderate as well as interspersed steep slopes in the northern half will be another geologic limitation, with regard to heavy equipment, driveway grades, and lawn maintenance.

3. SOILS

Soils on the property were mapped by the U.S.D.A. Soil Conservation Service and a soils map is included in this report. The mapping resolution for the soils information is about 2.5 to 3.0 acres, so soil units of smaller areas would not be delineated on the map. Soil boundary lines are not absolute and should be used merely as guidelines to the distribution of soil types on the site.

The development site is composed of soils developed from glacial till deposits. A wetland area associated with West Swamp Brook is situated in the western portion of the site.

Well drained upland soils are mapped on the site as Wethersfield loams (WkB, WkC, WkD). These are well drained soils located on drumlins and hilltops of glacial till uplands. These soils have moderate to severe erosion hazard. Permeability is moderate in the surface layer and subsoil, and slow to very slow in the substratum. The soils have a perched water table from February to April at a



United States
Department of
Agriculture

Soil
Conservation
Service

Middlesex County USDA-SCS
Middlesex County Extension Center
Haddam, CT 06438
345-3219



Scale 1" = 1320'



depth of 1.5 to 2.5 feet. Footing drains may be needed in buildings with basements. Seeps could create stabilization problems if side hill cuts are made during site grading.

Wethersfield loams on 3 to 8 percent slopes are rated as prime farmland of national importance. The soil on 8 to 15 percent slope is farmland of statewide importance.

Included with this soil in mapping are small, intermingled areas of well drained Cheshire and Yalesville soils, moderately well drained Ludlow soils, and poorly drained Wilbraham soils. Also included are small areas with a few stone and boulders on the surface and a few areas of soils that have a silt loam or fine sandy loam surface layer. Included areas make up 5 to 15 percent of this map unit.

Moderately well drained soils are mapped as Ludlow silt loams (LpB) on 3 to 8 percent slopes. These occur on drumlins and concave slopes of glaciated uplands. The hazard of erosion is moderate. Permeability is moderate in the surface layer and subsoil and slow or very slow in the substratum. There is a perched water table in these soils between November and April at a depth of 1.5 to 2.5 feet. Footing drains will be necessary in buildings with basements. Steep slopes of excavations tend to slump when saturated. Lawns are wet and soft in the spring and autumn and for several days after heavy rains in the summer.

These are prime farmland soils of national importance.

Included with this soil in mapping are small, intermingled areas of well drained Cheshire and Wethersfield soils and poorly drained Wilbraham soils. Included areas make up 5 to 15 percent of this map unit.

The developer's soil scientist reports the presence of Berlin silt loams (BcA) on 0 to 5 percent slopes (see wetlands map, sheet 19 of plans). This is a moderately well drained soil on glacial lacustrine terraces near Middletown.

Erosion hazard is high. Permeability is moderate in the surface layer, moderate to slow in the subsoil and very slow in the substratum. The soil has a perched water table between November and April at a depth of 1.5 to 3.0 feet.

Footing drains will be necessary for buildings with basements. Lawns are wet and soft in the spring and autumn and for several days after heavy rains in the summer.

These are prime farmland soils of national importance.

On the wetlands map, sheet number 19, the developer also notes the presence of Wilbraham silt loams (Wt) in the vicinity of lots 39 to 43. This is an inland wetland soil regulated under P.A. 155. On the map it is shown outside the wetland boundary. A letter from the developer's soil scientist should be requested to resolve this discrepancy. Wilbraham silt loam is also a prime farmland soil of statewide importance.

Wilbraham extremely stony silt loams (Wt) are poorly drained inland wetland soils in drainageways and depressions of glacial till uplands. The soil has a perched water table at a depth of 0 to 1.5 feet from November to April. Permeability is moderate in the surface layer and subsoil and slow or very slow in the substratum.

4. SEDIMENT AND EROSION CONTROL

The sediment and erosion control plan submitted with the development plans is missing several important elements, including:

1. A sequence of installation and/or application of sediment and erosion control measures. For example: When is the detention basin to be installed and seeded, and what sediment and erosion control measures will be used? Will each construction phase be permanently stabilized before the next one is started? Are there any special measures for winter shutdown?
2. The sediment and erosion control plan should include the installation of the sanitary sewer and the detention pond.
3. The detention pond specifications should include the following:
 - a. Specifications for a protected outlet.
 - b. Details for construction of the berm - for example: excavation of unstable organic materials to provide a solid base, proper compaction of berm materials, size of stone for spillway, trash guards for outlet pipes, etc.
 - c. Clearing of existing vegetation in the basin bottom, grading to allow for free drainage, stabilization of basin with vegetation.

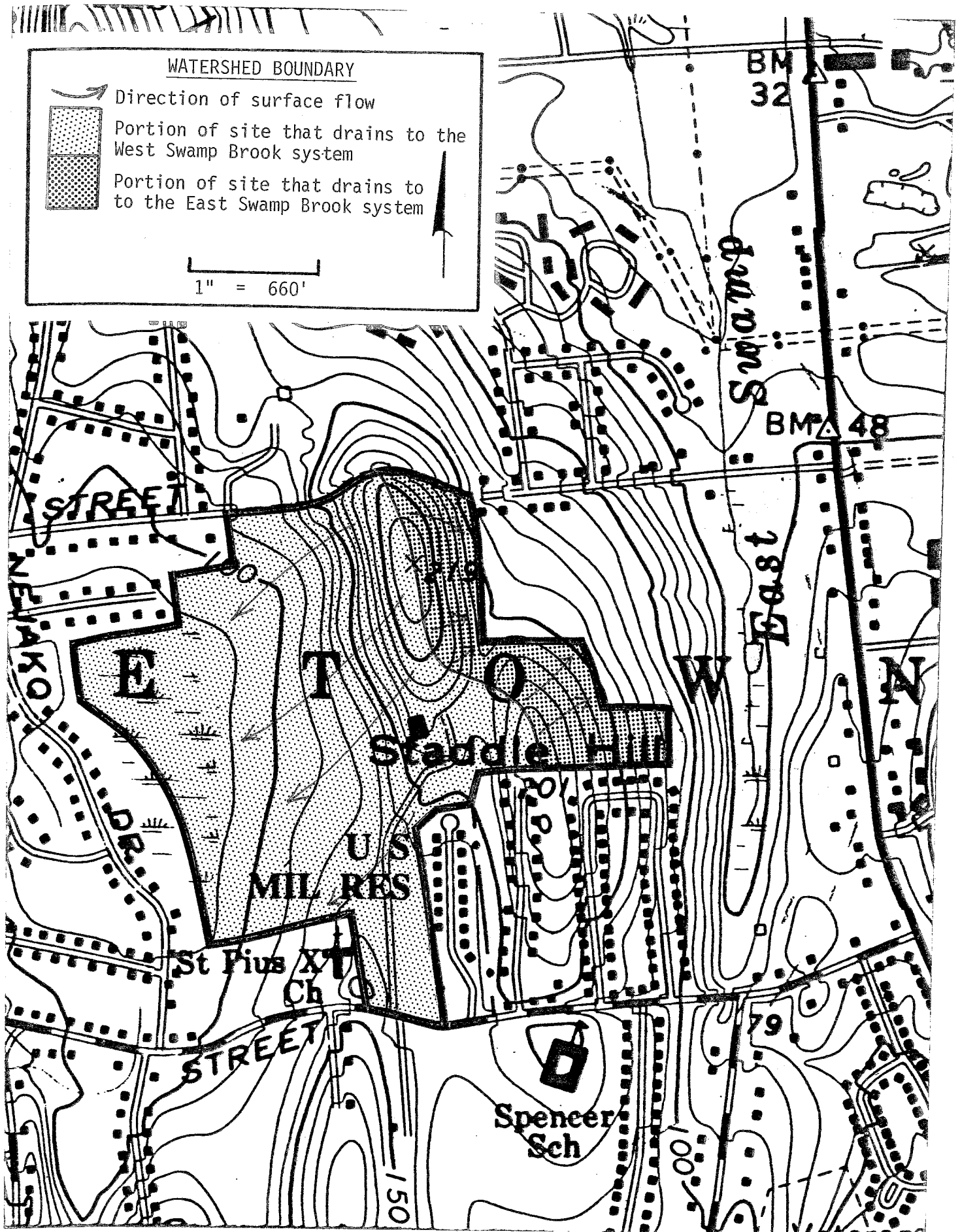
- d. Assignment of responsibility for long-term maintenance of the basin and development of a maintenance program.
 - e. How sediment accumulations will be periodically cleaned out.
 - f. An access road to the basin.
4. The name and phone number of a person responsible for sediment and erosion control measures should be included on the plans.
 5. Potential impacts (specifically, erosion and storm water management problems) of connecting storm drainage from a portion of the development to developments on the east side of Staddle Hill should be addressed.
 6. A typical sediment and erosion control plan should be included for individual lot development.
 7. Appropriate federal, state, and local permits must be obtained for proposed activities in wetland areas.

5. HYDROLOGY AND DEVELOPMENT IMPACTS

Surface runoff originating in the eastern parts of the site drains generally eastward to East Swamp Brook, a Mattabeset River tributary. Surface runoff originating in the western half of the site drains to a ± 29 acre wetland east of Nejako Drive. The outlet for the wetland flows into West Swamp Brook, a tributary to East Swamp Brook.

The construction of a residential subdivision with a high density on the property would be expected to increase the amount of runoff during periods of rainfall. These increases would result from soil compaction, removal of vegetation and placement of impervious surfaces (rooftops, driveways, roads, etc.) over the soil.

Present plans indicate that storm drainage arising in the eastern limits of the site (Stable and Brookview Lane) will be artificially collected and routed to the storm drainage system serving Spring Brook subdivision. It is understood that this storm drainage system has been designed to accommodate the anticipated increased flows. Surface runoff arising from the remainder of the site will also be artificially collected and routed to a detention basin proposed in the wetland in the western parts of the site.



The wetland in the western part of the site plays a role in regulating the streamflows to West Swamp Brook. During periods of heavy rainfall or snow melt, the wetland stores surface water temporarily, releasing it more slowly than would otherwise be the case, and thereby reducing the peak flood flows in West Swamp Brook. Also, as the Hubbard property is developed, this wetland will help to protect the quality of the surface water, both by the dilutive effect of retaining an undeveloped zone and by the natural biochemical processes that occur in wetlands. In addition, the wetlands also play an important ecologic role, such as wildlife habitat.

Town officials raised concern on the review day regarding the potential adverse impacts on the wetland by the proposed residential development, particularly the construction of a detention basin in the eastern quarter of the wetlands located in the western part. It appears that the major activities that could generate adverse impacts to this wetland include the following:

- 1) Road Construction. Construction of the road network at the intersection of Valley Drive, Brookview Lane, and McCormick Lane will culminate in the filling of a \pm .5 acre pocket of wetlands. According to the site plan, this wetland pocket does not connect with the larger wetlands. However, based on available geologic and soil mapping data, it appears that the two are probably hydrologically connected. Also, depending on desired house locations, driveways may also need to cross inland-wetland soils.
- 2) House Construction. Based on present plans, it appears that some house lots, particularly in the western limits, contain a high percentage of wetlands. The construction of houses on these lots could ultimately lead to wetland fillings by the property owners in order to have dry backyards.
- 3) Hydrologic Modifications. The construction of a dike and detention basin in the wetland will undoubtedly alter the hydrologic characteristics of the wetland. It will also modify and change the existing biological characteristics of the wetland.
- 4) Sedimentation. Sediments, generated from the Hubbard Estate subdivision site, if not controlled, could change the physical and biological character of the wetland. It may also change the flood elevation in the lowland area, at least during design storms of short duration.
- 5) Storm water Discharge. Release of storm water without any retention from the proposed subdivision has the capabilities to significantly alter the extent and duration of flooding, cause modifications to the biologic and ecologic characteristics of the wetlands and degrade water quality through the introduction of sediment and chemicals derived from lawns and paved areas.

In order to eliminate or minimize potential adverse impacts to the wetlands, the following mitigation measures could be incorporated into the project:

(1) -- Every effort should be made to avoid wetland crossings. Alternate routes which avoid wetlands altogether should be studied. If no alternate route can be accomplished, the route which impacts the least amount of wetlands should be taken. Although undesirable, wetland driveway or road crossings may be feasible provided they are properly engineered. The road should be constructed adequately above the surface elevation of the wetlands. This will allow for better drainage of the road and also decrease the frost heaving potential of the road. Unstable materials should be removed and replaced by a permeable road base material. 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. Finally, culvert(s) should be properly sized and located so as not to alter the water levels in the wetland or cause flooding problems. Also, house lots with a high percentage of wetland soils should be combined with adjoining lots so that there is a sufficient upland soils on the lots. Experience has shown that property owners with limited upland areas are likely to illegally fill the wetlands on their property in order to create "dry land", particularly if the lot is small to begin with.

Any proposed activity that impacts a regulated area must be approved by the Middletown Inland-Wetlands Commission. In reviewing a proposal, the Commission needs to determine the impact that the proposed activity will have on the wetlands. If the Commission determines that the wetlands is serving an important hydrological or ecological function, and that the impact of the proposed activity will be significant, they may deny the activity altogether or, at least, require measures that would minimize the impact.

(2) -- Prevent unwanted sediments, generated during site preparation and construction, from entering the wetlands. This can be accomplished through a detailed erosion sediment control plan. A combination of adequate natural buffers of soil and vegetation (should be widest in areas of steep slopes) and haybale/siltfence erosion controls should be installed. Also, there may be a need for a temporary sediment pool during active construction periods. Moreover, there should be a determination made as to who will maintain and clean catch basins, streets (road sand), etc. They must be cleaned regularly so as to prevent sedimentation into the wetland.

(3) -- Because of the existing flooding problems at Nejako Drive, the proposed storm water system for the western part of the site should be designed as such that there is no increase in discharge from the site. The proposed detention basin is located in the western most part of the wetland between the Hubbard Property and Nejako Drive. Rather than replace the wetland, which has some intrinsic capacity for storm water retention, the detention basin should be constructed on upland soils. This will minimize wetland impacts while providing the desired detention basin system.

According to the project engineer, the proposed detention basin will capture runoff from a watershed area of + 57 acres. As such, a diversion permit from DEP's Water Resources Unit will probably not be required. However, it might be wise to contact Bob Gilmore (566-7220) of the Unit to discuss the proposed plans. Also, the Dam Safety Unit of DEP's Water Resources Unit will need to review the plans for the proposed dike. The contact person for the Unit is Wes Marsh. He can be reached at 566-7245.

In summary, the applicant should be required to make a complete study of the local surface hydrology in the western parts of the site which includes an analysis of downstream culverts, especially those on Nejako Drive. Any increase in the runoff and peak flow increases from the proposed subdivision could aggravate the existing flooding problems experienced in Nejako Drive during major storm events i.e., 50 and 100 year storm event.

6. PLANNING REVIEW

Traffic

1. The numbers used in the traffic study appear to be correct and reasonable. Unfortunately, however, no narrative was provided, and it was difficult to discern what generation rate was used, what assumptions were made, and what the conclusions of the study actually were.

2. The proposed tie-in to Congdon Street and Spring Brook Drive is appropriate and sensible, however, there is a concern that McCormick Drive may ultimately become a short-cut route to those connections. Therefore, more consideration should be given to the design of the proposed McCormick Drive. Specifically, an attempt should be made to redesign the road to be more curvilinear in order to discourage excessive speeding and to improve traffic and public safety in the neighborhood.

Site Design

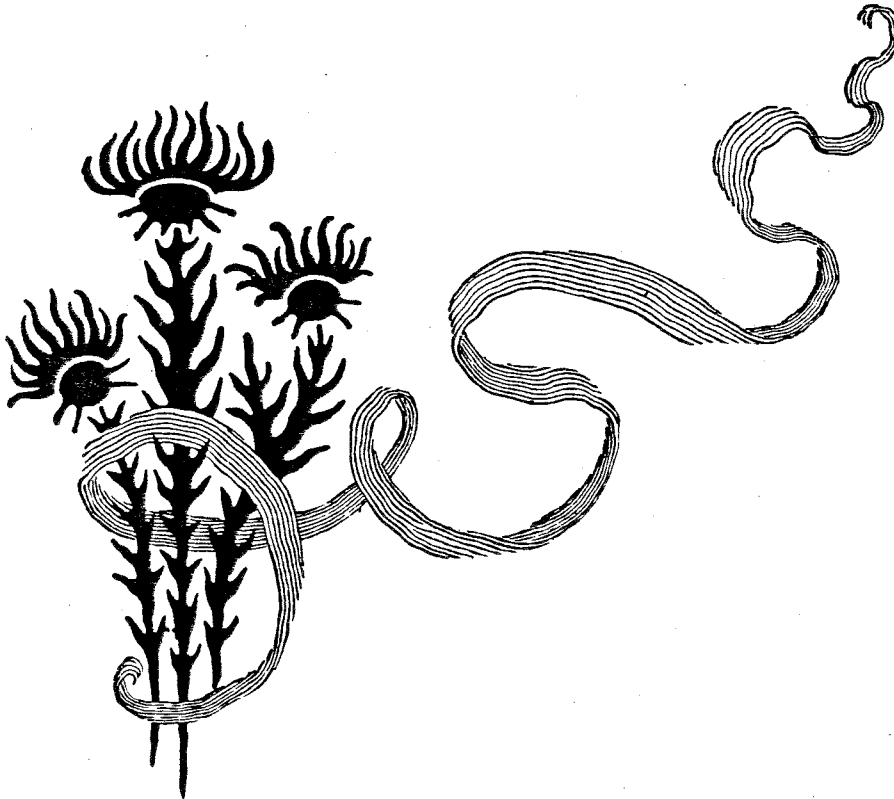
Lots 48, 49, 50, and 51 are extremely steep lots. Consideration should be given to combining these lots in order to make them larger, and therefore, more functional and practical.

Wetlands

Lots 42, 43, and 44 contain substantial wetlands, particularly Lot 44, which is nearly half wetlands. Consideration should be given to combining these lots to provide a larger amount of usable space per lot and to prevent fill-ins of the wetlands by the homeowners.

Drainage

It was not made clear whether a homeowner's association or the City of Middletown will be ultimately responsible for the long-term maintenance of the detention pond. If the City will be responsible for long-term maintenance, appropriate arrangements should be made now. If a homeowner's association will be responsible, this should be made clear to potential homeowners and a mechanism should be put in place prior to sale.



7. SUMMARY

NOTE: This is a brief summary of the major concerns, comments and recommendations of the Team. You are strongly urged to read the entire report and to refer back to specific sections in order to obtain all the information concerning a specific topic. The numbers in parentheses refer to the section and page number.

--Throughout the site the bedrock surface is relatively deep and should not be a problem with regard to the residential development of the site. (2, p.9)

--Seasonally high groundwater tables may affect sloping areas of the site, and it is recommended that building footing drains be installed where needed to reduce the chance of wet basements. (2, p.9 and 3, p.11)

--Other geologic limits to development are wetland soils in the western parts and moderate to steep slopes in the northern half. (2, p. 9 & 3, pp. 9-12 & 6, p.19)

--There is a discrepancy on the wetlands map, sheet #19 which should be resolved. (3, p.12)

--The sediment and erosion control plan submitted with the development plans is missing several important elements. See section 4 for specific items. (4, pp. 12-13 & 6, p. 18)

--Five major activities of development could adversely impact the wetlands: road construction, house construction, hydrologic modifications, sedimentation and storm water discharge. (5, p. 15)

--There are several mitigation measures that could be incorporated to minimize or eliminate potential adverse impacts. (5, p. 16)

--The applicant should be required to make a complete study of local surface hydrology in the western parts of the site, including analysis of downstream culverts. (5, p. 17)

--The project engineer should probably contact the DEP - Water Resources Unit with regard to the proposed detention basin, and the DEP - Dam Safety Unit will need to review the plans for the proposed dike. (5, p. 17)

--The traffic study provided no narrative so there was difficulty in making any judgements although the numbers used appeared correct and reasonable. (6, p. 17)

--There is concern that McCormick Drive may become a short-cut route so consideration should be given to its' design to discourage excessive speeding. (6, p. 18)

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.