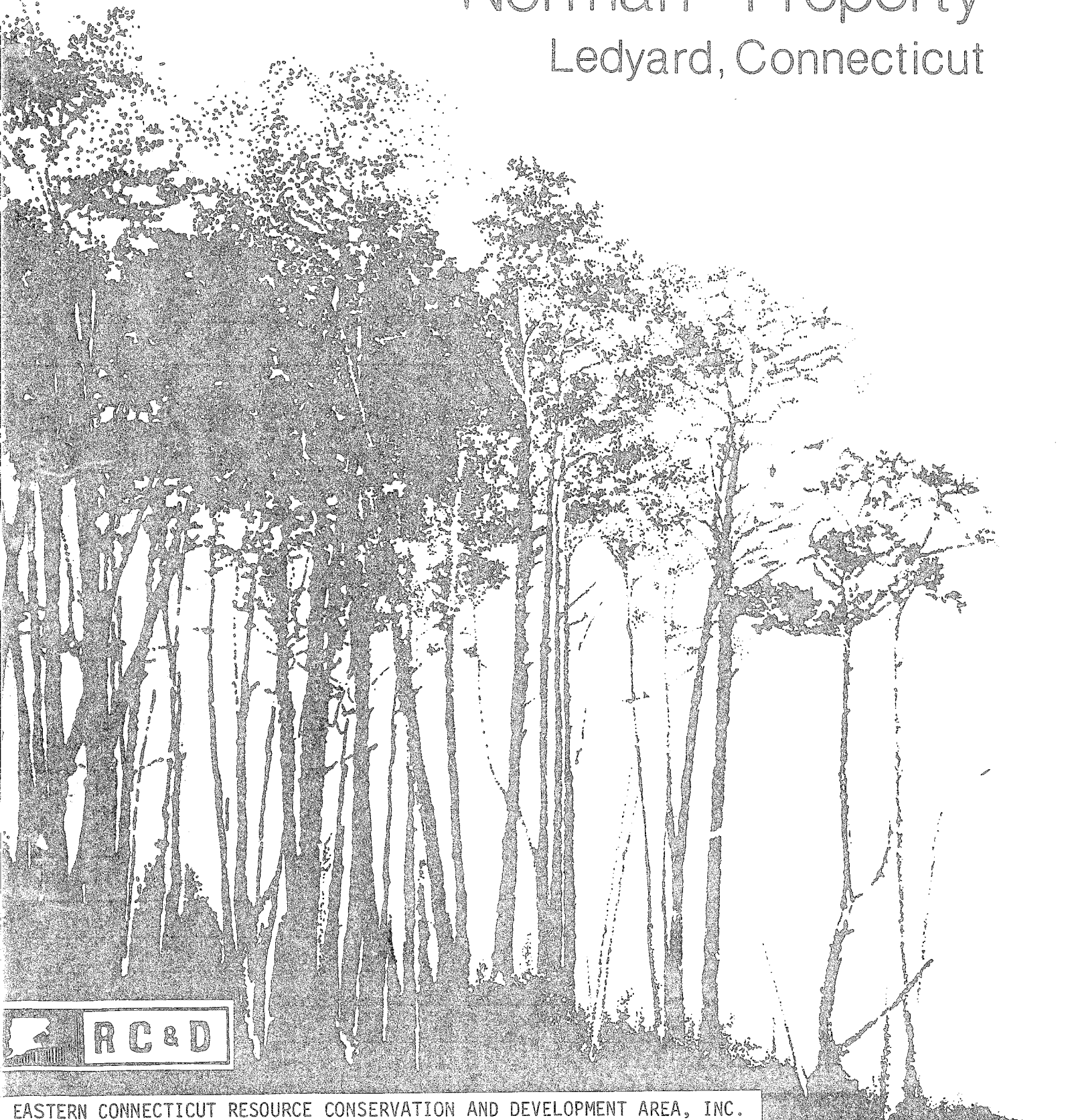


Environmental Review Team Report

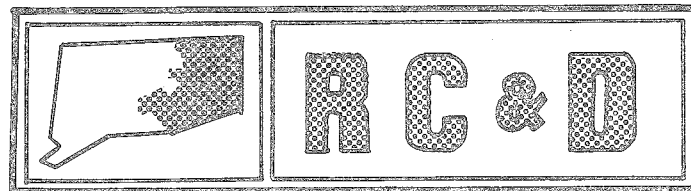
Norman Property Ledyard, Connecticut



Environmental Review Team
Report
on

Norman Property
Ledyard, Connecticut

November 1981

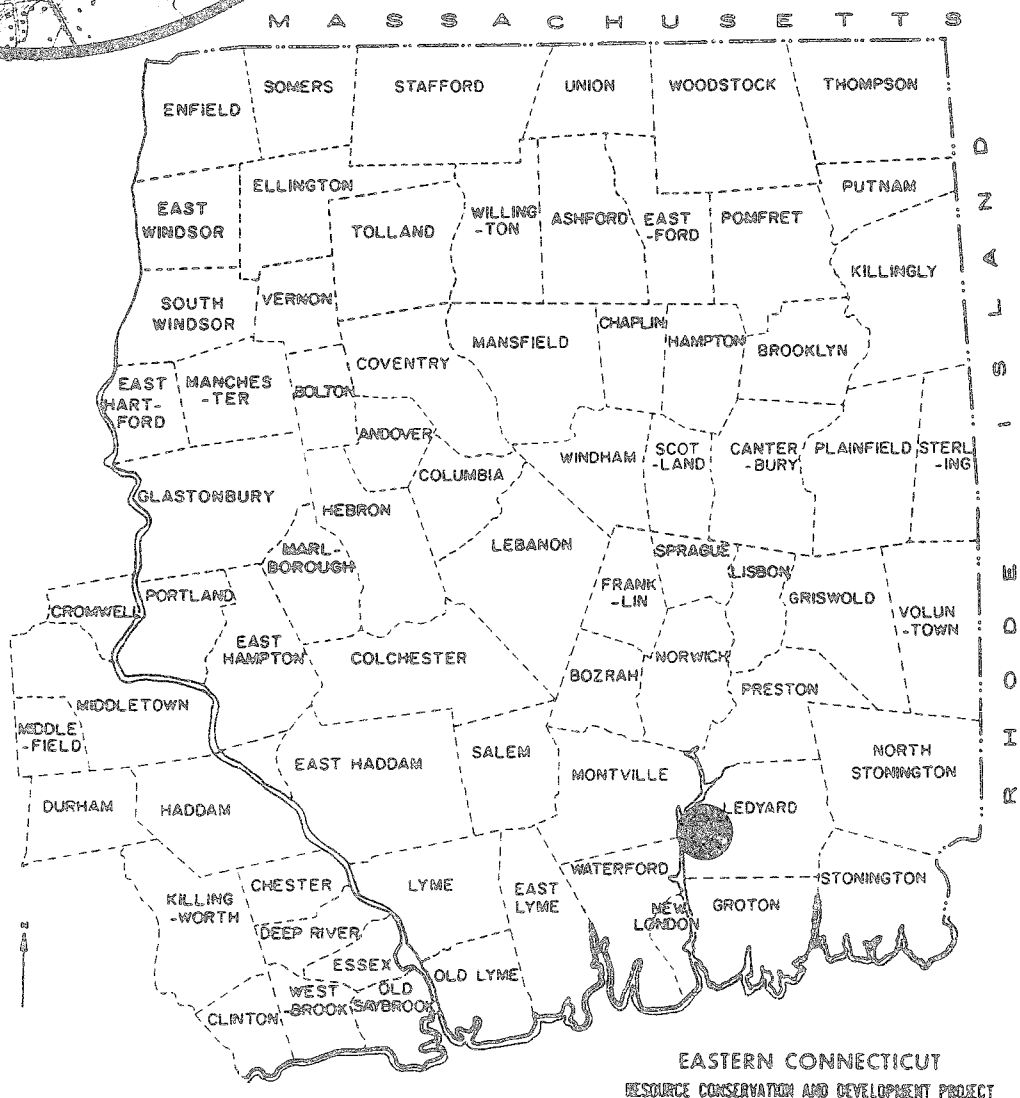
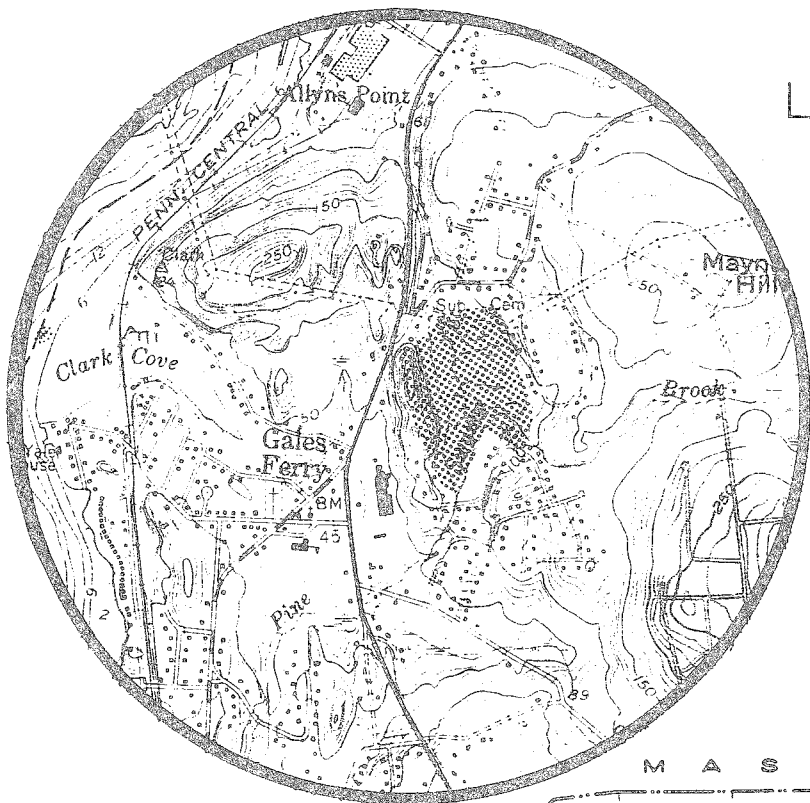


eastern connecticut resource conservation & development area

environmental review team
139 boswell avenue
norwich, connecticut 06360

Location of Study Site

NORMAN PROPERTY
LEDYARD, CONNECTICUT



EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT

ENVIRONMENTAL REVIEW TEAM REPORT
ON
NORMAN PROPERTY
LEDYARD, CONNECTICUT

This report is an outgrowth of a request from the Ledyard Inland Wetlands Commission to the New London 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 as a project measure. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

The soils of the site were mapped by a soil scientist of the United States Department of Agriculture (USDA), Soil Conservation Service (SCS). Reproductions of the soil survey map as well as a topographic map of the site were distributed to all ERT participants prior to their field review of the site.

The ERT that field checked the site consisted of the following personnel: Gary Domian, District Conservationist, Soil Conservation Service (SCS); Mike Zizka, Geologist, Department of Environmental Protection (DEP); Rob Rocks, Forester, (DEP); Tom Seidel, Planner, Southeastern Connecticut Regional Planning Agency (SCRPA); and Jeanne Shelburn, ERT Coordinator, Eastern Connecticut RC&D Area.

The Team met and field checked the site on Tuesday, October 27, 1981. Reports from each Team member were sent to the ERT Coordinator for review and summarization for the final report.

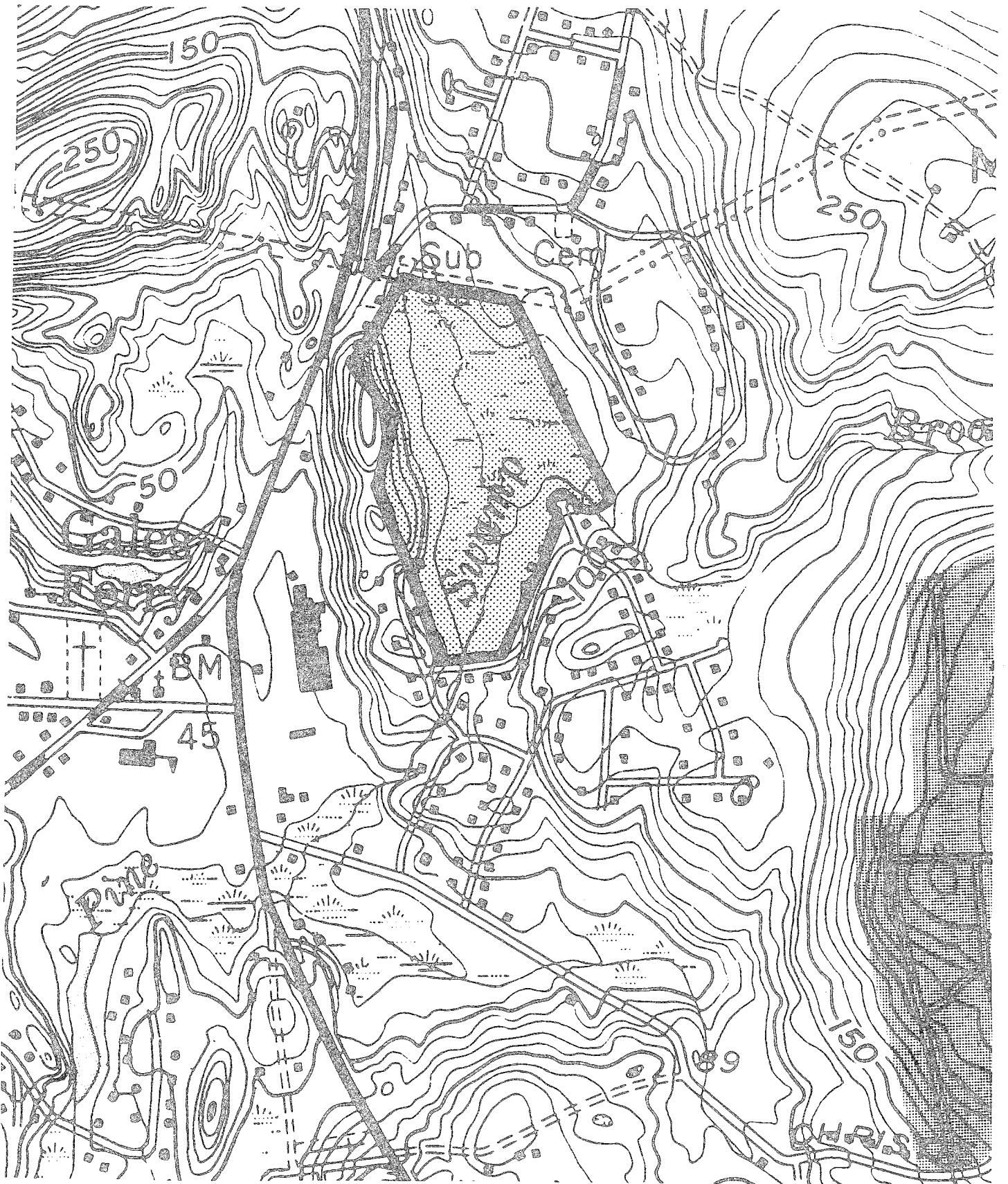
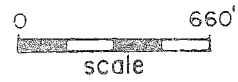
This report is not meant to compete with private consultants by supplying site designs or detailed solutions to development problems. This report identifies the existing resource base and evaluates its significance to the proposed development and also suggests considerations that should be of concern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

The Eastern Connecticut RC&D Project Committee hopes you will find this report of value and assistance in making your decisions on this particular site.

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

Topography

— Site Boundary



INTRODUCTION

The Eastern Connecticut Environmental Review Team was asked to prepare an environmental assessment for a development proposal in the town of Ledyard. The 30[±] acre site is located in a large wetland on Norman Drive in Gales Ferry. The property is presently in the private ownership of Irving Norman. George Dieter, a local surveyor, has prepared preliminary plans for the proposal.

The proposal calls for excavation of a small pond, filling an area adjacent to this pond and construction of a driveway through the area. Mr. Norman plans to construct a single residence on the higher ground of this site, served by an on-site well and septic system. The proposed driveway will serve as access to the residence.

The site is dominated by a wooded wetland area, surrounded by gently sloping higher ground around the perimeter. These "high ground" areas are characterized by soils that have less severe limitations to development than the wetland soils.

The Inland Wetlands Commission was concerned about the impact of this proposal on the immediate area to be excavated and filled, and also about the potential impact on the Pine Swamp Brook watershed as a whole. Information on these issues and on potential development alternatives is discussed in detail in the Hydrology, Soils and Planning sections of this report.

ENVIRONMENTAL ASSESSMENT

GEOLOGY

The Norman property is dominated by its central twenty-acre swamp. The surface layer in the hummocky but generally flat swamp consists of silt, sand, and clay mixed with a high percentage of decayed plant material. According to the property owner, this layer is only one or two feet thick in most places, but it may exceed that thickness in a few areas.

Glacial till underlies the swamp and also forms the surficial layer in the drier areas at the edges of the parcel. The thickness of the till deposit is unknown. Along the western boundary, the till is probably relatively shallow to bedrock, but in the northeastern corner, where the house is proposed to be built, a test hole revealed more than seven feet of till. The till from the test hole was sandy and friable, but it contained some silt and numerous large and small stones. A granite gneiss is believed to underlie the till at the proposed home site.

HYDROLOGY

The wetland on the site is part of the Pine Swamp Brook watershed. The brook, which originates in the 110-acre Pine Swamp about one-half mile east of the parcel, enters the property near the turn-around on Norman Drive. The courses of the brook and its tributaries are poorly defined within the swamp.

All surface drainage from the parcel passes through the culvert at the southern boundary. From that point, the brook flows through several more culverts, swamps, and ponds on its way toward Thames River at Mill Cove.

The landowner proposes two activities that would affect the swamp: dredging out a pond near the proposed home site, and using the materials removed to fill an area between the pond and the home site and to create a driveway extending along the eastern edge of the swamp from Norman Drive. The total area of swamp to be filled would be approximately 0.55 acre. The filled areas would be one to two feet higher than the average water level in the swamp.

Wetlands serve many valuable hydrological and ecological purposes. They act as natural runoff retention basins, reducing downstream flood flows during storms. They trap sediments from upstream areas. They change water quality through biochemical processes, often resulting in cleaner water. They also serve as habitat for many species of animals and plants. For these and other reasons, wetland filling should be avoided where possible. Nevertheless, not all wetland filling need be avoided if the risk of environmental damage is small.

From a hydrological viewpoint, it is difficult to assess the risks involved in permitting a small wetland area to be filled. In many instances, a particular act of filling may not in itself significantly reduce flood storage capacity. However, a series of small fills, each one of which would not have been detrimental in itself, may lead to a substantial detriment, such as more severe erosion and flooding problems downstream.

Presently, a great deal of wetland area occupies the Pine Swamp Brook watershed east of Route 12. This has undoubtedly helped to buffer the increases in peak flows in the brook that the residential developments in the watershed have produced. The vast wetland acreage also means that a small amount of fill in any one wetland would have only a minor, perhaps unnoticeable, effect on flows. Again, however, the possibility of a series of fills should be considered.

If the town could be assured that the filling now proposed by the landowner would be the last filling activity in the swamp on the site, there will be no significant hydrologic impact. The area to be filled represents less than five percent of the swamp and less than one-half percent of the total wetland acreage east of Route 12. Additionally, during the largest storm events (e.g. 50-year storm), the driveway would be flooded; this would effectively nullify the loss of storage capacity, since the whole swamp would again be available for storage. The heavier flows will also be metered by the numerous culverts downstream (including the Route 12 culvert, which was half-submerged on the day of the field review and probably should be replaced).

In brief, the Team believes that the proposed wetland filling will have, in itself, no significant hydrological impact. Nevertheless, since wetlands afford other values which deserve protection, the landowner should first explore alternate means of gaining access to the home site. Perhaps an easement from Terry Drive or Whalehead Road could be obtained. If no alternate routes appear practical, the town may wish to seek assurances that none of the remaining wetland area would be filled at a later time.

The creation of the pond will have no detrimental hydrological effects. It would be desirable for a botanist to examine the vegetation at the pond site for possible rare plants.

In conjunction with the review of the proposed wetland activities, the Team was asked to estimate peak flows in Pine Swamp Brook for storms of various magnitudes. Flows were estimated at both the proposed new driveway and at Nutmeg Drive. The estimates do not account for the effects of the culvert in the street just west of Pine Swamp. The estimates were derived by the SCS runoff curve-number method as described in SCS Technical Release No. 55. All flows are given in cubic feet per second (cfs).

TABLE 1: Flow Estimates for Pine Swamp Brook, in cfs.

	<u>2-year Storm</u>	<u>10-year Storm</u>	<u>25-year Storm</u>	<u>50-year Storm</u>	<u>100-year Storm</u>
At proposed driveway	107	275	447	600	783
At Nutmeg Drive	120	308	494	675	891

SOILS

A detailed soils map of this site and detailed soils descriptions are included in the Appendix to this report, accompanied by a chart which indicates soil limitations for various urban uses. As the soil map is an enlargement from the original 1,320'/inch scale to 660'/inch, the soil boundary lines should not be viewed as absolute boundaries, but as guidelines to the distribution of soil types on the site. The soil limitations chart indicates the probable limitations of each of the soils for on-site sewage disposal, buildings with basements, streets and parking, and landscaping. However, limitations, even though severe, do not preclude the use of the land for development. If economics permit large expenditures for land development and the intended objective is consistent with the objectives of local and regional development, many soils and sites with difficult problems can be used. The soils map, with the publication, New London County Interim Soil Survey Report, can aid in the identification and interpretation of soils and their uses on this site. "Know Your Land: Natural Soil Groups for Connecticut" can also give insight to the development potentials of the soils and their relationship to the surficial geology of the site.

The nearly level to gently sloping, very stony, moderately well drained areas on uplands are occupied by Sutton very stony fine sandy loam. This soil is designated by soil mapping unit 41XB. The letter "X" denotes a very stony surface condition. The letter "B" denotes slopes as being 0 to 8 percent. Sutton soils formed in friable glacial till. Permeability is moderate to moderately rapid. A seasonal high water table exists at 18 to 24 inches. Surface runoff is slow to medium.

The gently sloping, moderately well drained areas on uplands are occupied by Sutton fine sandy loam. Sutton fine sandy loam is designated by soil mapping unit symbol 41B. The letter "B" denotes slopes as being 3 to 8 percent. Sutton soils formed in friable glacial till. Permeability is moderate or moderately rapid. A seasonal high water table exists at 18 to 24 inches. Surface runoff

is slow to medium. Sutton fine sandy loam, 3-8% slopes, qualifies as Prime Farmland in the State of Connecticut.

The moderately steep to steep landforms that are bedrock controlled are occupied by Hollis-Charlton-Rock outcrop complex. The soils are designated by the mapping unit symbol 17MD. The letter "M" denotes rock outcrop and the letter "D" denotes a 15-35 percent slopes. Hollis soils formed in glacial till less than 20 inches thick over bedrock; Charlton soils formed in deep loamy glacial till; and Rock outcrop is exposed weathered and unweathered rock. The Hollis soils have moderate permeability and the Charlton soils have moderate to moderately rapid permeability. Hollis soils have medium to very rapid surface runoff and Charlton soils have medium to rapid surface runoff.

The nearly level, very poorly drained bogs and other depressional areas within lake plains, outwash plains, till plains and moraines are occupied by Carlisle muck. This soil is designated by soil mapping unit symbol 92. Carlisle soil formed in muck deposits greater than 51 inches thick. Permeability is slow to rapid and a high water table exists at or near the surface 9 to 10 months of the year. Surface runoff is very slow. Carlisle muck is designated as a regulated wetland soil under Public Act 155.

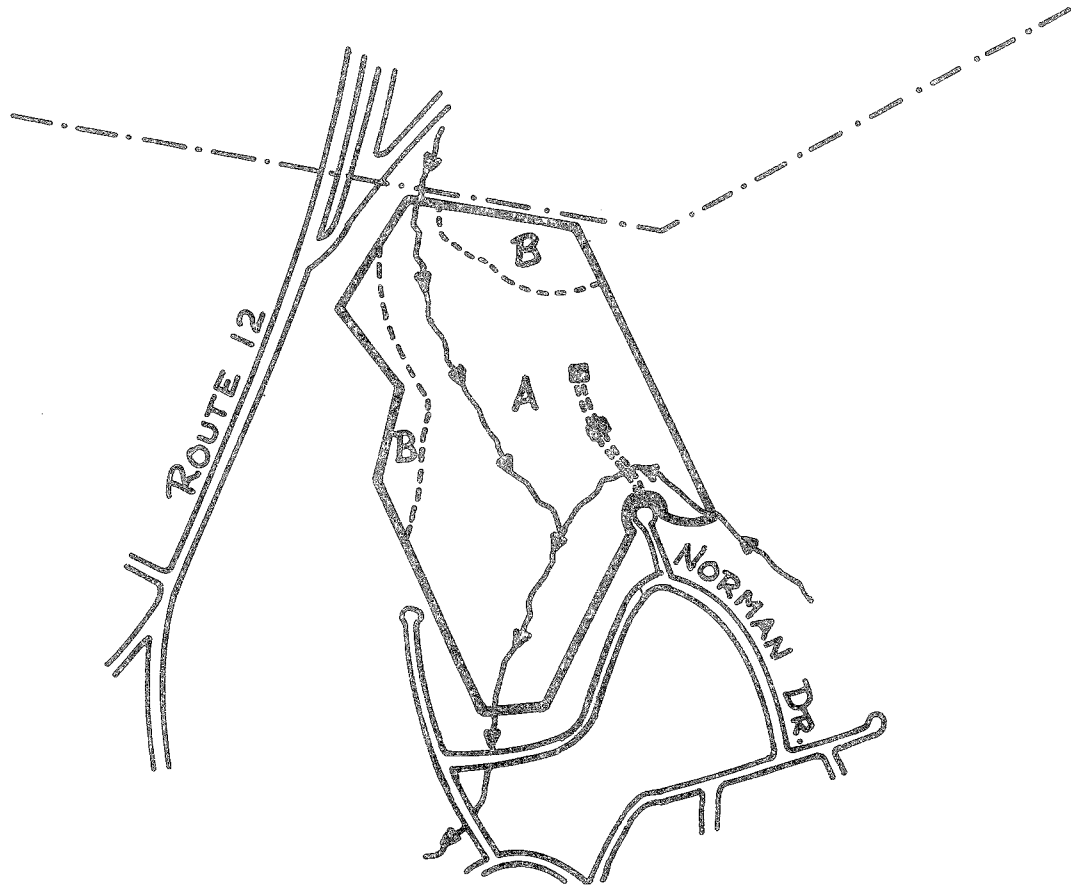
The proposed dugout pond project lies within the Pine Swamp Brook watershed which drains westerly and then south to Smith Pond, which eventually outlets into Mill Cove and the Thames River. Digging out the pond and filling in less than one third of an acre will have a minimal impact when measured against the entire watershed. The construction of the access road and one house within this area also will contribute a minor amount of runoff to downstream outlets. However, if this project is the beginning of a future subdivision that would require further filling and a decrease in size of this swamp, the possibility of impact downstream increases. Over 25 percent of the watershed has been developed for residential and commercial uses, and the remaining portion will have limitations to further development due to wetness, steep slopes, and the ability of existing storm water systems to handle increased runoff.

The proposed dugout pond could be brought closer to the upland till soil area shown as 41XB on the soil map, and, therefore, reduce the amount of wetlands that are actually filled. The natural runoff drainage can be routed along the south side of the pond and not be directed into the dugout pond. The pond would not serve any hydrological purpose that would benefit downstream runoff problems, however, it would enhance the wetland wildlife habitat in the swamp area. If the pond is intended to be a storm water control structure, then it should be noted as such and designed as a storm water control structure.

VEGETATION

Two distinctive vegetation types are present within this tract. They include approximately twenty-four acres of hardwood swamp and 5± acres of mixed hardwoods. (See Vegetation Type Map and Vegetation Type Descriptions.) Construction of the access road and pond may cause increased loss of trees to windthrow in the hardwood swamp area. Blockage or restriction of natural drainage which causes prolonged ponding may result in vegetation mortality.

Vegetation	Site Boundary	 0 660' scale	 N
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LEGEND

VEGETATION TYPE DESCRIPTIONS*

- Paved Road
- Gravel Road
- Property Boundary
- Vegetation Type Boundary
- Utility Line
- Stream
- Pump Station

- TYPE A. Hardwood swamp, 24[±] acres, variable stocking, sapling to pole-size.
- TYPE B. Mixed hardwoods, 5[±] acres, fully-stocked, pole to sawtimber-size.

- * Seedling-size = Trees less than 1 inch in diameter at 4 1/2 feet above the ground (d.b.h.)
- Sapling-size = Trees 1 to 5 inches in d.b.h.
- Pole-size = Trees 5 to 11 inches in d.b.h.
- Sawtimber-size = Trees 11 inches and greater in d.b.h.

Vegetation Type Descriptions:

Type A. (Hardwood Swamp) This 24[±] acre hardwood swamp is vegetated with sapling to pole size red maple in clumps, along with scattered white ash, American elm, and black gum. The majority of trees in this variably stocked stand are poor in quality. A dense understory of sweet pepperbush, spice bush, highbush blueberry, arrowwood, swamp rose, swamp elderberry, poison sumac, and spirea is present. Ground cover and herbaceous vegetation include phragmites, green brier, oriental bittersweet, Atlantic yam, skunk cabbage, cinnamon fern, sensitive fern, swamp dewberry, sphagnum moss, and on the drier hummocks, club moss.

Type B. (Mixed Hardwood) High quality pole to sawtimber-size red oak, black oak, white oak, tulip tree, white ash, red maple, sugar maple, and black birch dominate this stand which is full stocked. Flowering dogwood, mountain laurel, witch hazel, maple-leaved viburnum and blue beech form the understory in this stand. Ground cover consists of green brier, poison ivy, Pennsylvania sedge, Virginia creeper, Christmas fern, club moss, striped pipsissewa, huckleberry, partridge berry and several species of aster. Several large sawtimber-size red oak and tulip tree are present near the proposed home site. These trees, because of their high aesthetic value, should be retained. Most of the trees in this stand are healthy and still growing vigorously. Management of this stand is not needed at this time; however, removal of dead and damaged trees for fuelwood use will not lower the quality of this stand.

Development of this property as proposed may impact the vegetation which is present in several ways.

The construction of the pond and access road through the hardwood swamp area will necessitate some clearing of the vegetation in these areas. Road length and width, together with pond size, will determine the magnitude of this clearing operation. Trees which are removed should be utilized for fuelwood when feasible.

The trees which are present within the hardwood swamp area have shallow root systems caused by poor soil aeration. The potential for tree loss through windthrow is high in this area because the trees are unable to become securely anchored in the saturated soils. Clearing operations such as those noted above may allow wind to pass through rather than over this area increasing the already high windthrow potential. Clearing in the hardwood swamp area, therefore, should be kept to a minimum so that the windthrow hazard is not intensified.

It is important that the proposed access road through the hardwood swamp area does not block or restrict natural drainage flows. Blocking or restricting natural flows may cause prolonged ponding of water over vegetation roots. This may result in considerable mortality of the trees, shrubs, and herbaceous vegetation growing in these areas. Over time, vegetation will, however, become established which is able to adapt to the new water level condition. These changes may significantly alter the appearance and character of this wetland.

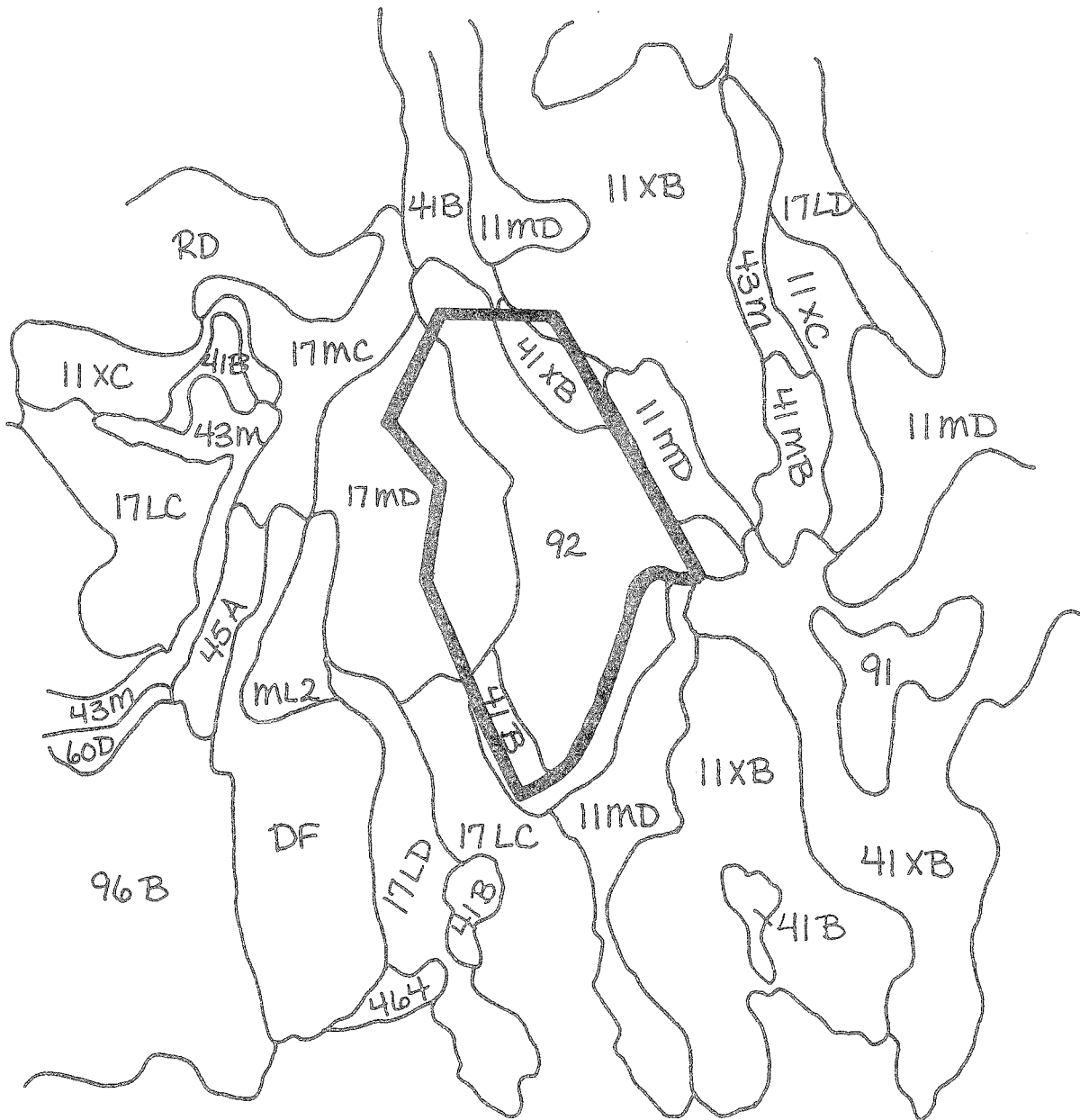
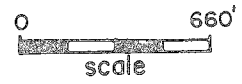
LAND USE CONSIDERATIONS

One home on a large lot is compatible with the surrounding low to medium density residential uses on Whalehead Road and Terry Drive. The Town Plan of Development recommends this area for medium density residential uses and the area is zoned for residential 40,000 square foot lots. One potential way to gain access to the site without building the driveway through the wetlands would be to purchase land or a right-of-way off the south side of Terry Drive or off of Whalehead Road south of the cemetery.

Appendix

Soils

— Site Boundary



IRVING NORMAN PROPERTY
LEDYARD, CONNECTICUT

PROPORTIONAL EXTENT OF SOILS AND THEIR LIMITATIONS FOR CERTAIN LAND USES

Soil Series	Soil Symbol	Approx. Acres	Percent of Acres	Principal Limiting Factor	Urban Use Limitations*			
					On-Site Sewage	Buildings with Basements	Streets & Parking	Land-Scaping
** Carlisle	92	18	52	Floods, Wetness	3	3	3	3
Hollis-Rock outcrop	17MD	11	31	Slope, Depth to Rock	3	3	3	3
Sutton	41B	2	6	Wetness	3	3	2	1
Sutton	41XB	4	11	Wetness	3	3	2	2

Limitations: 1 = slight, 2 = moderate, 3 = severe
** Inland Wetlands Soil Regulated Under P.A. 155.

SOIL INTERPRETATIONS FOR URBAN USES

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

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

Slight Limitations

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

Moderate Limitations

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

Severe Limitations

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

About the Team

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

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

PURPOSE OF THE TEAM

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

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

REQUESTING A REVIEW

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

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