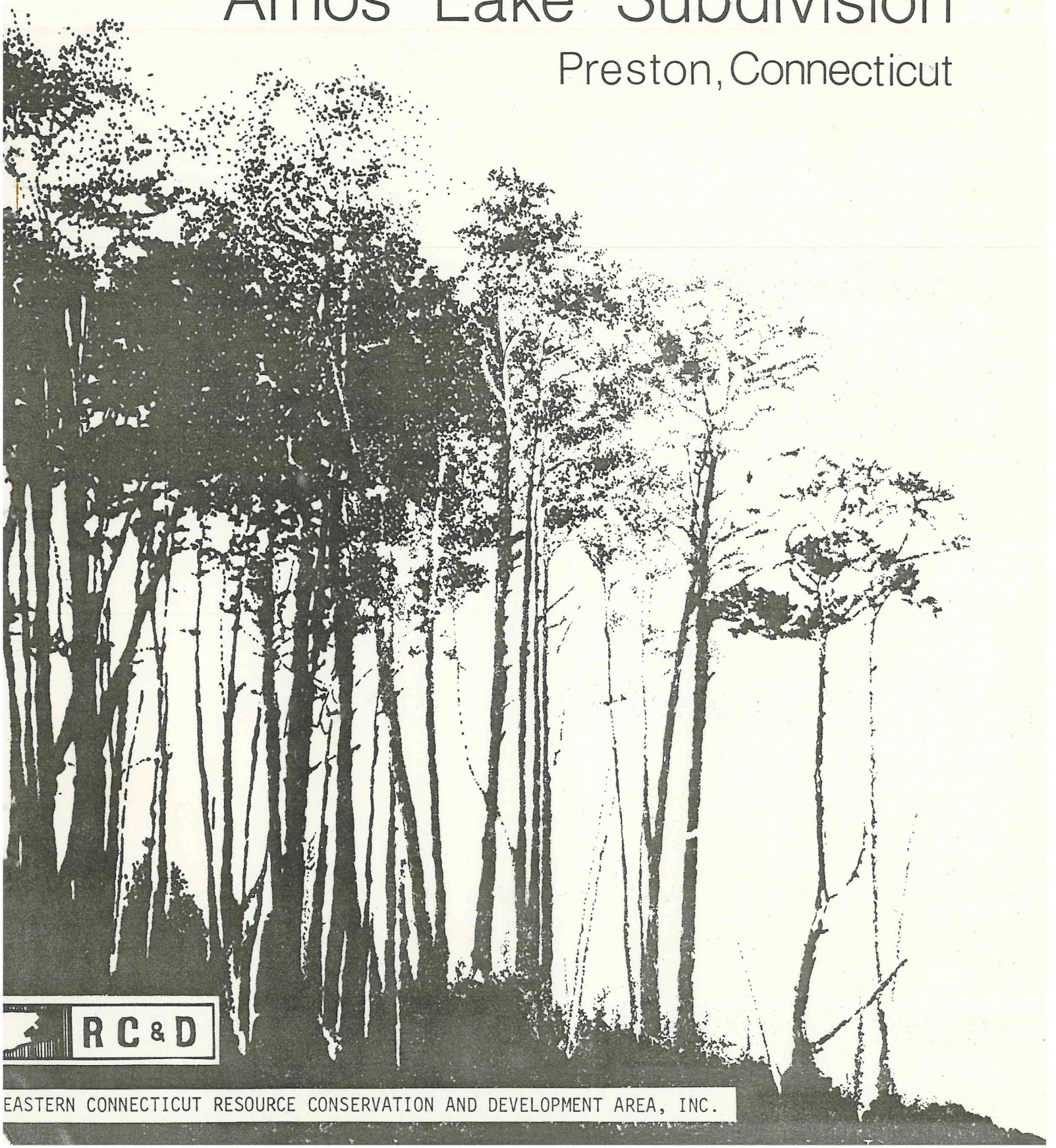
Environmental Review Team Report

Amos Lake Subdivision

Preston, Connecticut



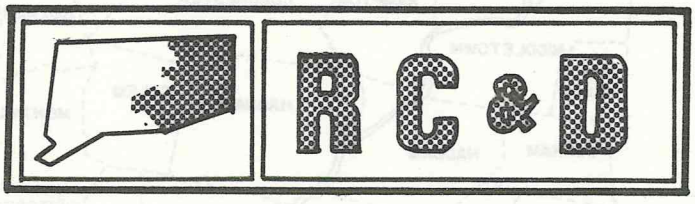
RC&D

EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

Environmental Review Team Report on Amos Lake Subdivision

Preston, Connecticut

July 1980

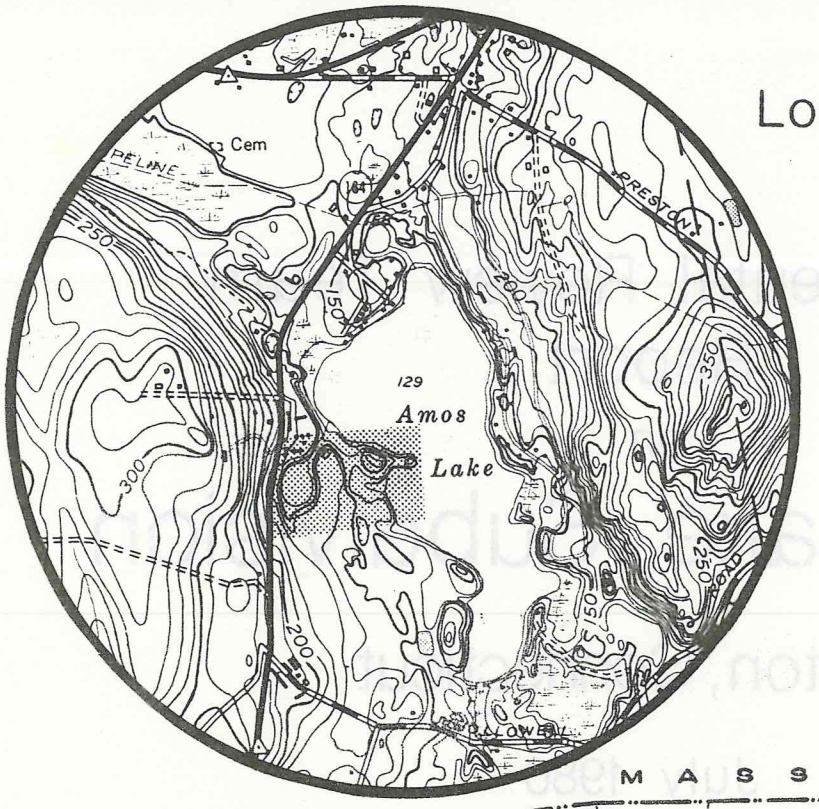


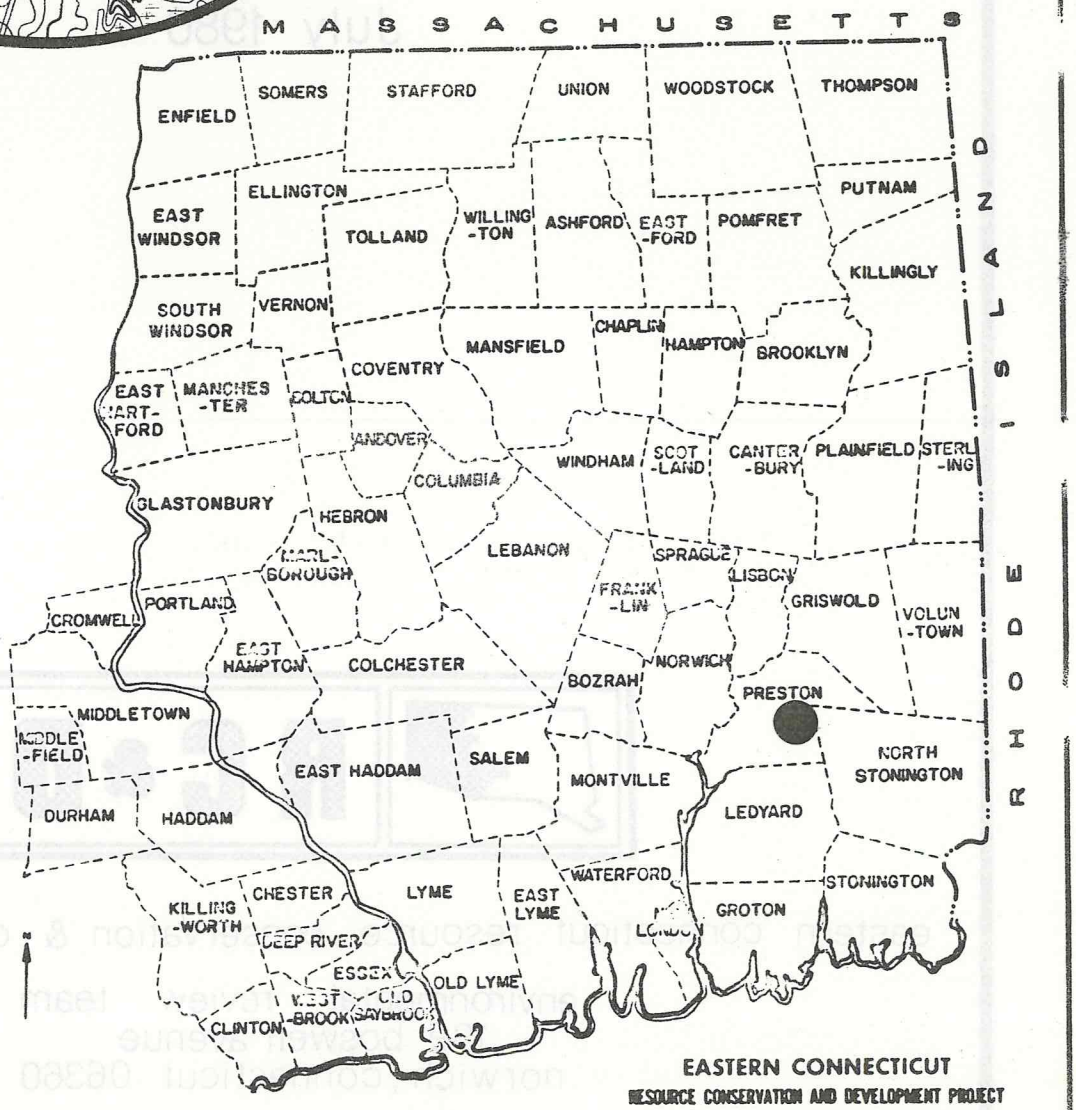
eastern connecticut resource conservation & development area

environmental review team
139 boswell avenue
norwich, connecticut 06360

Location of Study Site

Amos Lake Subdivision
Preston, Connecticut





EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT

ENVIRONMENTAL REVIEW TEAM REPORT
ON
AMOS LAKE SUBDIVISION
PRESTON, CONNECTICUT

This report is an outgrowth of a request from the Preston Planning and Zoning 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.

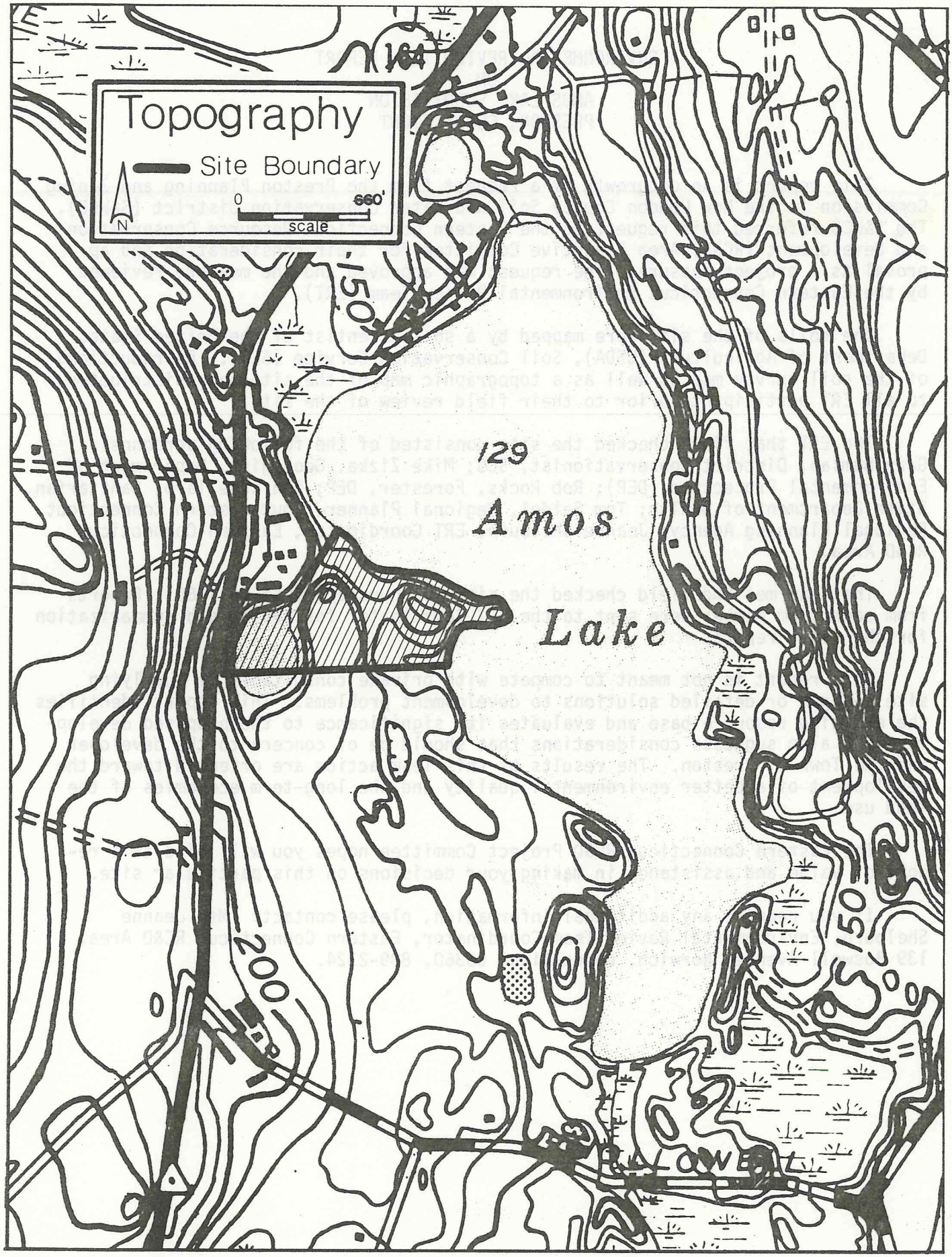
The ERT that field checked the site consisted of the following personnel: Gary Domian, District Conservationist, SCS; Mike Zizka, Geologist, Department of Environmental Protection (DEP); Rob Rocks, Forester, DEP; Don Capellaro, Sanitarian, State Department of Health; Tom Seidel, Regional Planner, Southeastern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

The Team met and field checked the site on Thursday, June 5, 1980. 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 Preston. 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
0
660'
scale
N
164
150
200
129
Amos
Lake
200
150
LOWELL

INTRODUCTION

The Eastern Connecticut Environmental Review Team was asked to assess the impact of a proposed 6 lot subdivision on Amos Lake in Preston. The site, approximately 13± acres in size, is located on the east side of Route 164 and extends to Amos Lake. The property is presently in the private ownership of Richard House, whose residence is on the site. Preliminary plans were prepared several years ago by George Dieter, a local land surveyor.

Preliminary plans show the property divided into 6 lots of approximately 1 1/2 acres each. All lots will be served by on-site wells and on-site septic systems. Access to Route 164 will be provided by a new road extending into the site and terminating in a cul-de-sac. Lot 3 has a home with underground utilities already established on it.

The site is partially wooded at present. A large grassy field in the center of the property extends down to a marshy depression on Lot 6. This area was at one time flooded to form Shadow Pond. A small section of the property was used for gravel extraction at one time. The majority of soil types on the site are excessively well drained.

The Team is concerned with the effect of this proposal on the natural resource base of the site. Although many severe development limitations can be overcome with proper engineering techniques, these measures can be costly, making a project financially unfeasible for a developer. The most severe environmental problems which may result from development of this site, relate specifically to water quality. Due to the rapid permeability of soils on the site, there is a potential for poorly renovated septic effluent to enter wells on the property or Amos Lake. (See Hydrology, Water Supply, and Waste Disposal sections of this report.) Several ways to minimize this problem are also discussed in the report. These include a shift in lot boundaries which may allow for better placement of wells and septic systems; maximum separating distances between wells, septic systems and Amos Lake; location of wells up slope from septic systems; using bedrock based wells which are cased to the bedrock; use of a community well; redesign of the proposal to favor clustered housing; or a reduction in numbers of lots in the subdivision. Use of salt on the subdivision access road should also be minimized to reduce the potential for any chemical deterioration of Amos Lake.

ENVIRONMENTAL ASSESSEMENT

GEOLOGY

The surficial geology of the site consists primarily of stratified drift and thin pond swamp sediments. Stratified drift is composed of rock materials that were washed by meltwater streams from a mass of stagnant glacier ice. Because the materials were transported and deposited by water, they commonly are well-sorted by grain size and are layered (stratified). The stratified drift on the site was exposed in an excavation. At least 15 feet of cobble gravel, bouldery gravel, and sand was observed. The total thickness of the stratified drift is now known, but

bedrock contours shown in USGS Map GQ-1434, The Surficial Geology of the Jewett City Quadrangle, by B.D. Stone, suggest a thickness of 30-50 feet. Thin (probably less than 5 feet thick), fine-grained deposits overlie stratified drift in a large depression at the western end of the parcel.

A pond that formerly occupied the depression was drained, and a swamp environment has taken over. Consequently, the thin sediments consist primarily of partly decayed plant material mixed with some silt, fine sand, and clay.

No bedrock outcrops were observed, and none are believed to be present on the site. Rock underlying the site is likely to be schist or gneiss composed primarily of the mineral quartz, feldspar, biotite, muscovite, and hornblende.

HYDROLOGY

Drainage from all parts of the site flows ultimately into Amos Lake. Proposed lot 6 and part of lot 5 drain westward into the large swamp and then into the lake. Proposed lots 1 and 2, and part of lot 3 drain northward into the lake. Proposed lot 4 and parts of lots 3 and 5 drain into a shallow swale in the southeastern section of the parcel and then into the lake. Because of the small size of the parcel, the few lots proposed, and the storage areas available for runoff (the swamp and Amos Lake itself), the increases in runoff due to development should have no effect on flooding in the area.

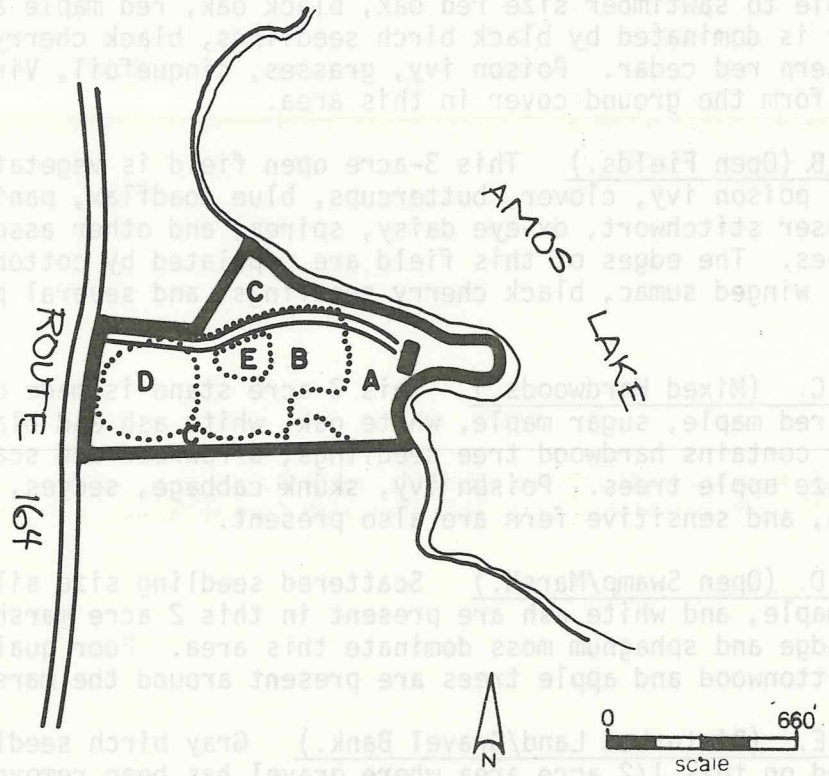
The principal water quality concerns relate to septic systems and road maintenance. Because of the coarse, gravelly nature of the surficial geologic cover, groundwater is transmitted relatively rapidly. Moreover, less fine-grained material (silt and clay) is available to remove contaminants. It would be desirable to maximize separating distances from septic system leaching areas to both wells and surface waters. This may be difficult in lot 2 because of its particular shape (narrowing upgradient from the lake), and it may be impossible in lot 6 because of the extremely limited land area in that lot. Some shifting of lot boundaries may improve the situation. It is suggested that on-site wells tap bedrock to minimize the potential for well contamination. Some influx of nutrients into Amos Lake may be unavaoidable, but if septic systems are carefully designed and installed, no great problems would be anticipated. Use of salts on the subdivision road should be minimized also to reduce the potential for chemical deterioration of the lake's water quality.

VEGETATION

This 13± acre tract may be divided into five vegetation types. These include two mixed hardwood areas totaling 6 1/2 acres; open field, 3 acres; open swamp/marsh, 2 acres; and disturbed land, 1/2 acre. (See Vegetation Type Map and Vegetation Type Descriptions.)

The largest, healthiest trees on this property have aesthetic and shade value, and should be retained to the greatest extent possible. Care should be taken not to disturb these trees during grading and construction practices.

VEGETATION



LEGEND

Road

Property Boundary

Vegetation Type Boundary

VEGETATION TYPE DESCRIPTIONS*

TYPE A. Mixed hardwoods, 3.5-acres fully-stocked, pole to sawtimber.

TYPE B. Open fields, 3-acres.

TYPE C. Mixed hardwoods, 3-acres under to fully stocked, pole-size.

TYPE D. Open swamp/marsh, 2-acres under stocked, seedling-size.

TYPE E. Disturbed land, 1/2-acre weed species.

* 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. (Mixed Hardwoods.) This 3.5 acre area is fully stocked with moderately healthy pole to sawtimber size red oak, black oak, red maple and black birch. The understory is dominated by black birch seedlings, black cherry seedlings and scattered eastern red cedar. Poison ivy, grasses, cinquefoil, Virginia creeper and club moss form the ground cover in this area.

Type B. (Open Fields.) This 3-acre open field is vegetated with grasses, goldenrod, poison ivy, clover, buttercups, blue toadflax, panic grass, wild strawberry, lesser stitchwort, ox-eye daisy, spirea, and other assorted wildflower and weed species. The edges of this field are populated by cottonwood seedlings, wild raspberry, winged sumac, black cherry seedlings, and several pole-size red oak and red maple.

Type C. (Mixed Hardwoods.) This 3-acre stand is made up of poor quality pole size red maple, sugar maple, white oak, white ash and black cherry. The understory contains hardwood tree seedlings, arrowwood and scattered poor quality sapling-size apple trees. Poison ivy, skunk cabbage, sedges, jack-in-the-pulpit, marsh fern, and sensitive fern are also present.

Type D. (Open Swamp/Marsh.) Scattered seedling size silky willow, pussy willow, red maple, and white ash are present in this 2 acre marsh. Cattail, spirea, tussock sedge and sphagnum moss dominate this area. Poor quality pole size black cherry, cottonwood and apple trees are present around the marsh perimeter.

Type E. (Disturbed Land/Gravel Bank.) Gray birch seedlings are becoming established on this 1/2 acre area where gravel has been removed. Spirea, wild strawberry, ox-eye daisy and blue toadflax are also present.

It would be desirable from an aesthetic and shade standpoint to retain as many healthy trees as possible on this tract. The trees that are to be retained should be temporarily but clearly marked, so they are not disturbed by construction practices.

The proposed grade changes should not be made within the entire area under the crowns of trees that are to be retained. Trees are very sensitive to changes in soil conditions. Any soil disturbances which may change soil aeration or moisture levels, including raising or lowering soil depths, may cause tree injury to mortality which may not appear for several years.

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 limitation 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, very poorly drained soils in bogs and depressional areas within lake plains, outwash plains, till plains, and glacial deposits called moraines are occupied by Carlisle muck. The soils are designated by the mapping unit symbol 92. The soils formed in muck deposits greater than 51 inches thick. The soils below 51 inches vary from sands and gravels to firm glacial till. The soils are very poorly drained and have slow to rapid permeability. The highwater table is at or near the surface, 9 to 10 months of the year. Surface runoff is very slow. This soil is designated as a wetland soil and is regulated under Public Act 155.

The nearly level to moderately steep terraces facing the lake are occupied by Hinckley gravelly sandy loam. Hinckley soils are designated by the mapping unit symbols 60C and 60D. Hinckley soils are excessively drained and have rapid permeability in the surface layer and subsoil, and very rapid permeability in the substratum. Runoff is slow.

The limitations to using the Carlisle muck for urban use are obvious. This area is best left undisturbed so that it can function as a water recharge area, stormwater control area and as a natural wildlife area. In this capacity, the muck area is an asset to the surrounding property.

The Hinckley soils have moderate limitations to most uses because of slope. In the moderately steep areas of these soils, the limitations increase to severe because of increasing slope. Droughtiness is especially of concern in using these soils for development because of difficulty in establishing lawns and landscaping in the summer months.

The Hinckley soils have permeability rates that are rapid to very rapid. This situation can lead to on site sewage disposal systems allowing leachate to migrate toward on-site wells and into the lake. Locating the on-site wells up slope from all the septic systems is the most basic way of avoiding well contamination.

Pollution to the lake is a concern when using these soils for septic systems on lots nearest the lake. The septic systems should be placed back from the lake according to local health and zoning codes. Leachate from the septic systems will encourage increased algae growth if it enters the lake.

WATER SUPPLY

Individual on-site wells are proposed for each lot. The stratified drift deposits have potential for high-yielding wells; however, because most families only need yields of 2-3 gallons per minute (gpm) and because there is a greater risk of well contamination if the stratified drift on this site is tapped (see Hydrology section), it is suggested that bedrock-based wells be provided. Although it is virtually impossible to predict the absolute yield of a well drilled at any given location, nine out of ten bedrock wells yield at least 3 gpm. In addition, the quality of groundwater supplied by bedrock wells in southeastern Connecticut is

generally good. Troublesome concentrations of iron and manganese have been encountered in water withdrawn from wells in the Preston City area, north of Amos Lake. However, these concentrations have been found in wells tapping stratified drift as well as in wells tapping bedrock, so no drawback to using bedrock is created. "Hard" water was obtained from a bedrock well west of the proposed subdivision, but since no large, discrete carbonate rock units are found in the area, the occurrence of such water in other local wells may not be consistent. If mineral concentrations are found to be too high in the groundwater obtained on the site, a variety of filtration and softening devices are available to correct the problem.

In general, wells should be located to the high side of lots, properly separated from sewage disposal systems and protected from surface contamination or other possible forms of pollution (salt, fuel oil, etc.). Most of the soil in the area is highly permeable. Where soils tend to be coarse, lacking a sandy matrix, there can be rapid movement of sewage effluent without receiving good filtration and renovation before the waste water passes back into the natural groundwater table and/or eventually seeps to ground surface. In some situations, where it may not be feasible or possible to locate a well above the area of sewage disposal, the chance for possible well contamination can be minimized by the following: Increase the separating distance between the well and sewage disposal system(s); off-set the well site from the subsurface leaching area; utilize drilled wells and increase the overall length of well casing with a tight seal into underlying bedrock; grout the well utilizing a cement mixture.

SEWAGE DISPOSAL

The rural Town of Preston does not have a municipal sewerage system, so it relies on on-site subsurface sewage disposal systems. It is the intent of the Town to continue to avoid public sewers in the foreseeable future.

Visual observations and soil mapping data indicate that most of the area is composed of well drained gravelly soil. Some areas are more steeply sloped than others. The initial portion of the site off of Route 164 contains a large depression with a flow-through watercourse which was formerly a pond site. The stream flows into Amos Lake at the northeast side of the property following along the property line.

It is understood there would be considerable regrading of the lower portion of the property, utilizing the soil in the higher terrain adjacent to (east) the former pond site. In general, due to soil texture, it should be well suited for absorbing subsurface sewage effluent. However, because the soil is coarse and would be expected to have rapid seepage, it would not afford ideal conditions for filtering and renovating the effluent to a stabilized form. Therefore, sewage systems, in addition to meeting minimum code requirements, should be located as far as possible from the shoreline, stream and wells in the development. In general, minimum lot sizes would be relatively large. However, in order to insure better spacing and utilization of natural conditions, and to afford greater protection for resources, the possible reduction to a five (5) lot subdivision should be considered.

PLANNING CONCERNS

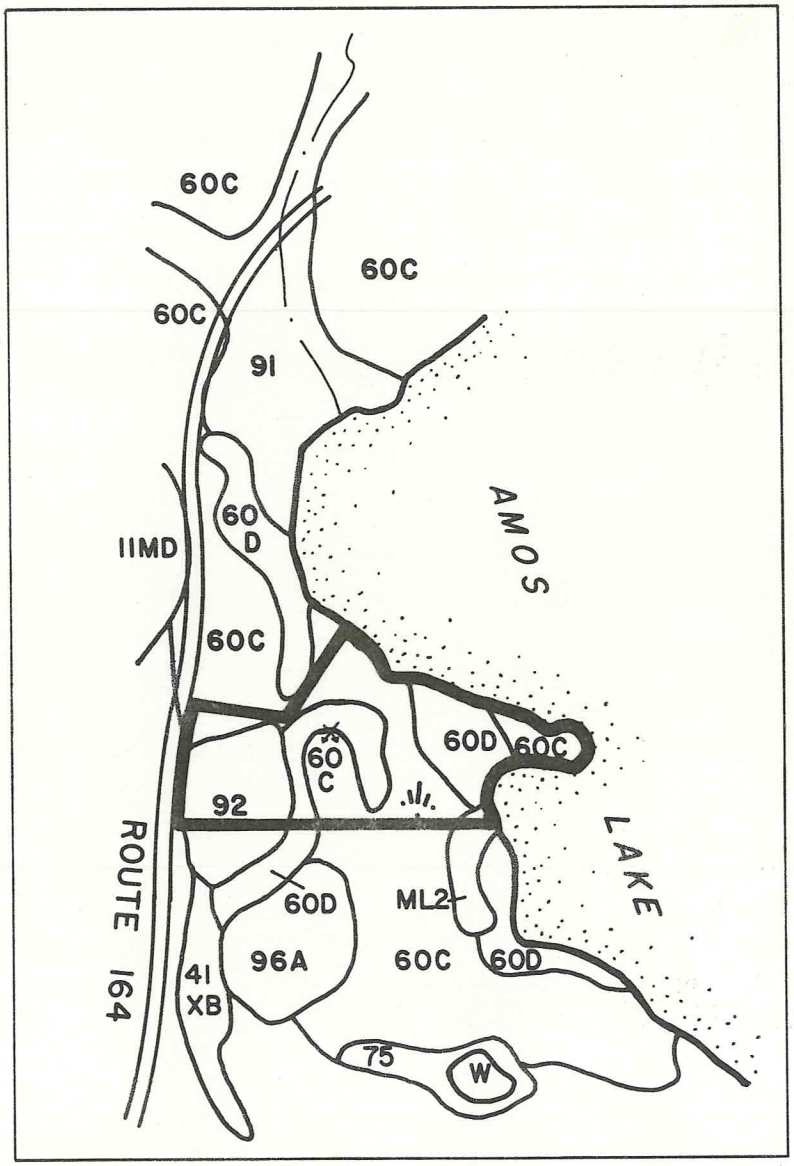
Surrounding land uses are undeveloped and low density residential. A farm vegetable stand is located immediately west of the site. The area is zoned for residential 60,000 square foot lots. On a land use basis, the proposed subdivision should be compatible with existing uses. Alternative uses would probably be open space or sand and gravel extraction, which has occurred in the past.

In 1979 a desk-top eutrophication analysis for Amos Lake was conducted by the Southeastern Connecticut Regional Planning Agency as part of the Agency's water quality planning program. The study assessed non-point phosphorus sources and loadings from non-urban lands. The study indicated that care should be exercised in the conduct of land use activities in the lake watershed so that water quality does not deteriorate further. For the proposed development, phosphorus from septic systems is the major pollutant to be of concern. The acre and one-half lot sizes required in this area should provide room to locate septic systems back from the lakeshore for lots 1 and 2. For instance, if systems on these lots could be located 200 feet back from the lake with at least 10 feet to the water table, then a septic system life of about 21 years is projected. This is the age after which phosphorus would be contributed to the lake. This is simply a desk-top calculation intended to give an order of magnitude and is not meant to replace site design and analysis after final site grading. If septic systems on these lots are set back, then care should be used in well construction so that septic tank effluent is not intercepted by the wells located between the septic systems and the lakeshore. Any drilled wells should be cased to the surficial/bedrock interface. Another approach to this problem would be to develop a community well at perhaps the rear of lot 5 to serve all the homes. This would separate the well from the septic systems.

The possibility of cluster development might also be used to help with this problem, as well as to avoid regrading the entire site. Under cluster residential development the dwelling units are grouped closer together in the site with remainder of the land preserved as open space. The overall density of units cannot exceed that permitted by the zoning. Under cluster development, site development costs are usually lower because fewer roads, drainage facilities, and utilities are required. Section 9 of the Preston Zoning Regulations permits planned development districts for multi-family uses for parcels at least 10 acres in size and may be regarded as a form of cluster development.

School, library and fire protective services are available in Preston City about 1.3 miles north of the site along Route 164. Other government offices are located at the Town Hall about 2 1/2-3 miles southwest of the site.

Appendix



Soils

N

0 660'

SCALE

AMOS LAKE SUBDIVISION
PRESTON, 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	3	24	Wetness, floods	3	3	3	3
Hinckley	60C	6	46	Slope, rapid permeability	2	2	2	2
Hinckley	60D	4	30	Slope, rapid permeability	3	3	3	3
		13	100					

Limitations: 1=slight, 2=moderate, 3=severe.

** Regulated wetland soil 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.