Hermann

environmental review team report

LOWER FARM

North Stonington,
Connecticut

RC&D

EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT

ASSISTED BY: U.S. DEPARTMENT OF AGRICULTURE,
SOIL CONSERVATION SERVICE AND COOPERATING AGENCIES

ENVIRONMENTAL REVIEW TEAM REPORT
ON THE
LOWER FARM
NORTH STONINGTON, CONNECTICUT
AUGUST, 1974

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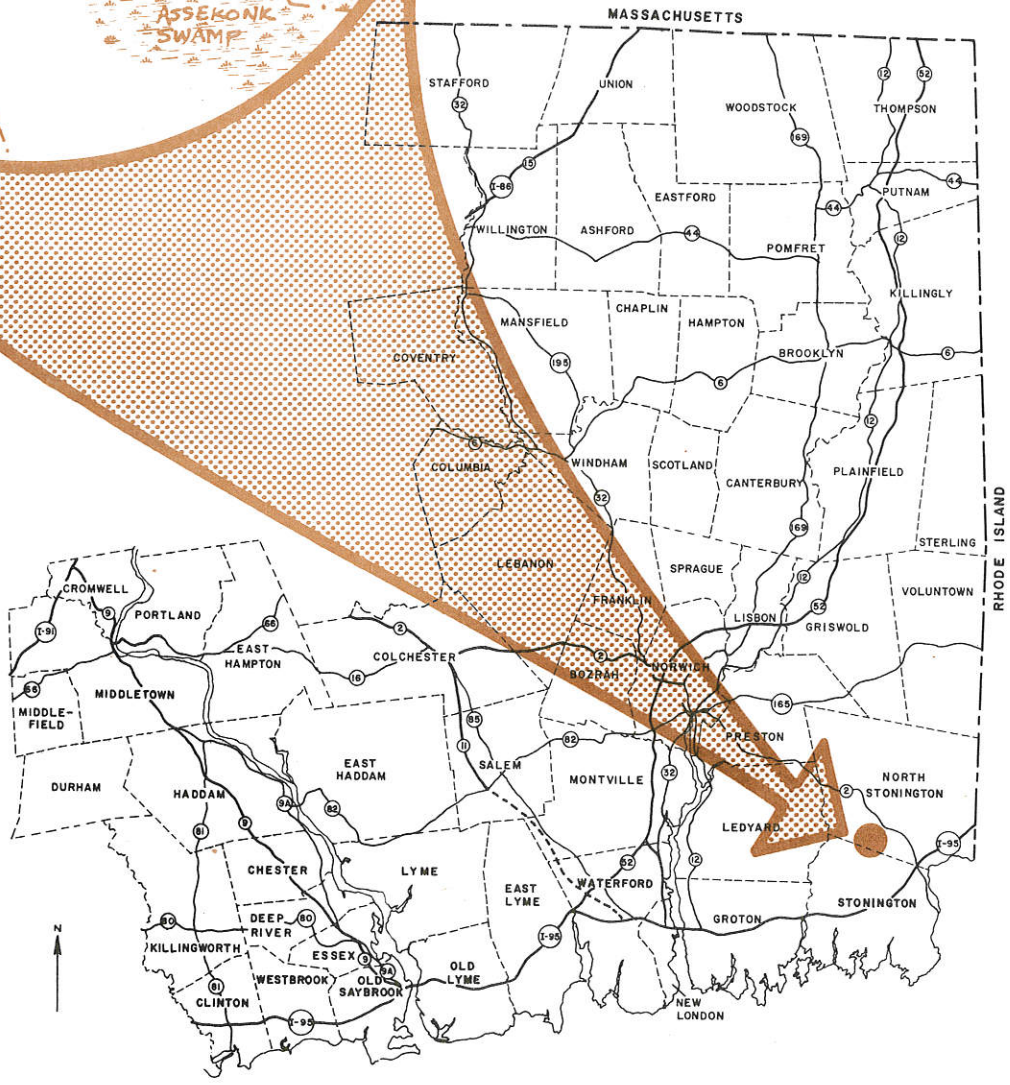
EASTERN CONNECTICUT RESOURCE CONSERVATION
AND DEVELOPMENT PROJECT
Environmental Review Team
139 Boswell Avenue
Norwich, Connecticut 06360

LOCATION OF STUDY SITE

LOWER FARM
NORTH STONINGTON, CONNECTICUT



EASTERN CONNECTICUT
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This report is an outgrowth of a request from the North Stonington Planning and Zoning Commission, with the approval of the land owners, 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) Executive Council for their consideration and approval as a project measure. The request has been approved and the measure reviewed by the Environmental Review Team.

The soils of the site were mapped by a soil scientist of the USDA Soil Conservation Service. Reproductions of the soil survey and a table of limitations for urban development were forwarded to all members of the Team prior to their review of the site.

The Team that reviewed the proposed development consisted of the following personnel: Sherman Chase, District Conservationist, Soil Conservation Service (SCS); Edwin Minnick, Civil Engineer, SCS; Daniel Meade, Geologist, Natural Resource Center, State of Connecticut Department of Environmental Protection (DEP); Clarence G. Merrill, Forester, DEP; T.E. Linkkila, Wildlife Biologist, DEP; Joseph J. Piza, Fishery Biologist, DEP; Robert W. Davis, Fishery Research Assistant, DEP; Manuel Cardoza, Jr., Sanitarian, State of Connecticut Department of Health; David Miller, Climatologist, Connecticut Cooperative Extension Service (EXT); Rudy Favretti, Landscape Architect, EXT; Linda Simkanin, Planner, Southeastern Connecticut Regional Planning Agency; Barbara A. Hermann, Team Coordinator, Eastern Connecticut RC&D Project.

The Team met and reviewed the site on June 20, 1974. Reports from each Team member were sent to the Team Coordinator for review and summarization.

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 Town of North Stonington and the developers. 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 Council 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: Miss Barbara A. Hermann (889-2324), Environmental Review Team Coordinator, Eastern Connecticut RC&D Project, 139 Boswell Avenue, Norwich, Connecticut 06360.

INTRODUCTION

Lower Farm is located approximately 1.5 miles west-southwest of the village of North Stonington. The property lies to the east of Jeremy Hill and Mystic Roads. The most significant aspect of this site is that it abuts the Assekonk Swamp State Forest, a State regulated hunting area. Portions of the swamp extend onto the Lower Farm property.

At present, the only development being proposed is a small subdivision on the portion of the property south of Assekonk Brook, which is now wooded and undeveloped. The lots are to be about 5 acres in size, each with about 200 feet of frontage on Jeremy Hill Road. The rear of the lots would extend eastward into the swamp.

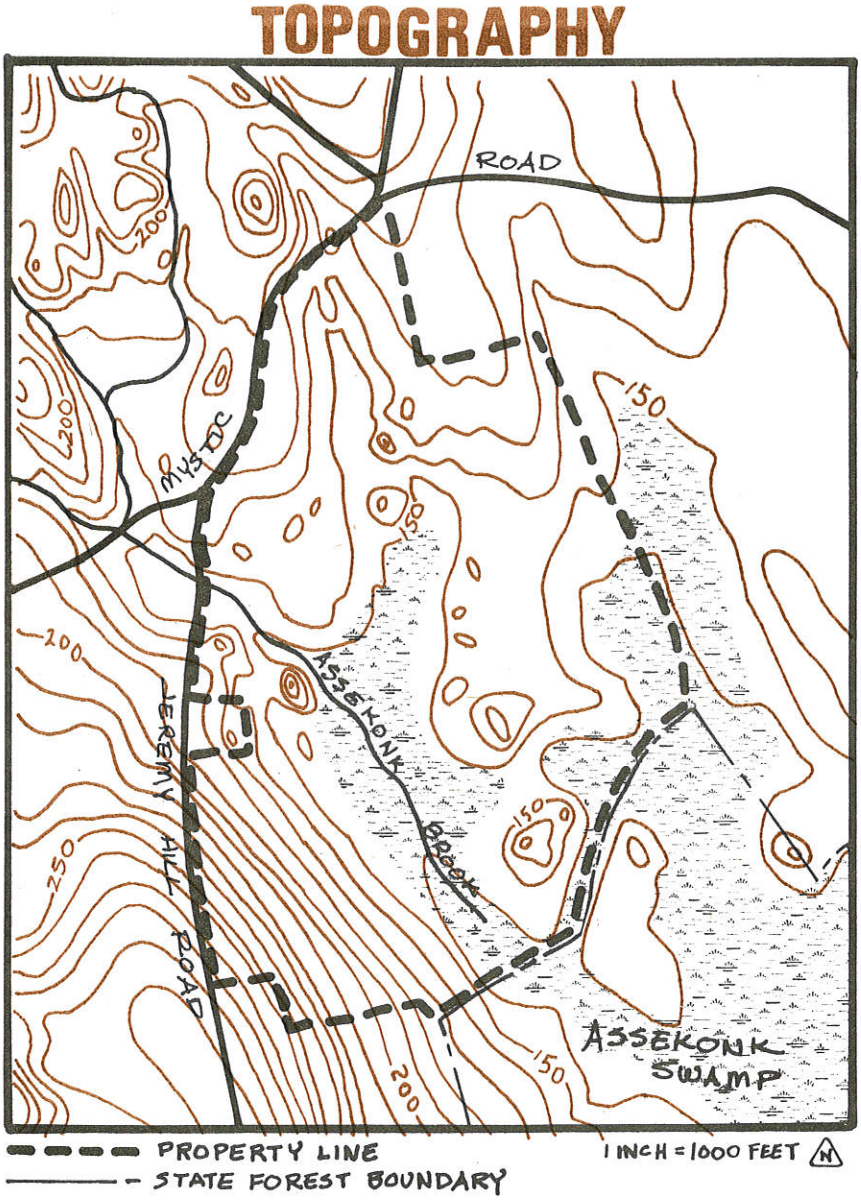
Despite the fact that there are presently no other plans for this site, the Town of North Stonington also wants to know the potential for development and the probable limitations of the remaining areas. This is largely a result of difficulties which have arisen with an existing subdivision to the east of Assekonk Swamp.

The following report will first describe the natural resources on the site and then discuss the various aspects of the proposed development. Comments or recommendations are offered for consideration by the developer and the town in the preparation and review of development plans, but should not be construed as mandatory or regulatory in nature.

EVALUATION

EXISTING RESOURCES

Topography. As can be seen on the map below, this site has a varied topography, with elevations ranging between 140 and 250 feet above mean sea level. The area north of Assekonk Brook is fairly level with slopes mostly under 10%. South of Assekonk Brook, along Jeremy Hill Road, is a fairly steep hillside with slopes generally exceeding 10%. The southeast boundary of the site abuts the Assekonk Swamp State Forest.



Soils. A detailed soils map of this property is given in the Appendix to this report along with a soils limitations chart. Due to the original scale at which the soils are mapped (1"=1,320') the lines shown on the soils map should not be viewed as precise boundaries, but rather as guidelines to the distribution of soil types on the property. The soils limitations chart indicates the probable limitations for each of the soils for on-site sewage, basements, landscaping, and streets and parking. However, limitations, even though very severe, do not always preclude the use of the land for development. If economics permit greater 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.

By far, the most dominant soils on the Lower Farm property are the inland wetlands soils (24, 27M, 58, 91, 92, 291). These soils are all poorly to very poorly drained and fall under the jurisdiction of the Inland Wetlands Act. They encompass 69.4 acres or 44.7 percent of the site.

Three of the wetlands soils, 91, 92, and 291, are peats and mucks high in organic material. The peat and muck layers in both 91 and 291 are fairly shallow, while 291 exceeds three feet. Soils 24 and 27M are upland soils, with water tables at or near the surface in the wet seasons. During a dry summer, however, the water table may drop considerably. Soil 58 is alluvium, located on flood plains, which has highly variable texture and drainage characteristics.

The next largest soil group on the site are the rocky soils, shallow to bedrock (17LBC, 17LD, 200BC). They comprise 23.9 percent of the site. The major portion of these soils are now being used for agricultural purposes, though there is a band of these soils located along Jeremy Hill Road in the vicinity of the proposed subdivision. Rock outcrops are common in these soils and the shallow depth to bedrock can cause problems in development. However, pockets of deep soils can also be found within the area which are suitable for septic systems, basements, etc.

Hardpan soils (31A, 35B) comprise 16 percent of the site and are restricted to the most northern of the upland areas. These soils are underlain by a slowly permeable hardpan at about 2 feet in depth. This results in a high water table during wet seasons and after heavy rains. Also, water may move laterally down slope over the hardpan in wet seasons.

About 10.9 percent of the site can be classified as well-drained upland till soils (52BC, 52D, 650B). These soils are primarily located east of Jeremy Hill Road on the steeply sloping hillside. The main drawback here will be the steep slopes (over 15%) of the dominant soil (52D).

The remaining soils on the site represent an insignificant portion and should have no effect on future plans.

Geology. Though neither bedrock nor surficial geologic maps are published for the Old Mystic quadrangle, some preliminary data does exist for the area. The site is underlain by Sterling granitic gneiss with an overburden of till on the hillsides and sand and gravel in the lowland areas.

The Sterling granitic gneiss is fairly typical of rock in this part of Connecticut. It consists of assemblages of quartz, feldspars, and minor amounts of associated minerals. The rock is generally medium to coarse grained in texture and is light colored, ranging from pink to red to gray. Overall the rock is relatively competent, but does contain fractures capable of yielding small quantities of water to domestic wells.

The hilltop and hillside areas are covered by till, a heterogeneous mixture of clay, silt, sand, gravel, and boulders deposited from glacial ice without the benefit of sorting by water. The areas of till generally coincide with those areas above the 150 foot elevation on the topography map. Typically, the hydraulic conductivity of these materials is relatively low and is generally unsuitable for water supply wells.

The lowlands are characterized by sand and gravel deposited from the meltwater streams of glaciers. These materials have good hydraulic conductivity and high infiltration capacity. The sand and gravel materials on the Lower Farm are generally saturated within a few feet of the land surface. There are swamp deposits within the area and the grain size distribution is confined mainly to the fines, sand, and silt.

Vegetation and Wildlife. Most of the upland areas of the Lower Farm are being used for pasture or other agricultural purposes. Thus, there is little forest. However, there are many copses of trees and hedgerows which are both scenic and valuable to wildlife. The wetland portion of the site is basically an extension of the Assekonk Swamp State Forest.

Assekonk Swamp is a State-owned wildlife management area which receives heavy year round use. It is an extensive (over 600 acres) fresh-water wetland interlaced by a system of natural channels and surrounded by minimally disturbed upland forests. It supports a wide variety of flora and fauna. The heaviest use of the swamp is in the fall during hunting season. The area is stocked with pheasant and has resident grouse and migrant woodcock. There is also seasonal use of the swamp for waterfowl hunting, trapping, fishing, and education. With its close proximity to populated areas, it serves a large number of recreationists.

Land Use. In addition to the State Forest, the surrounding land uses include residential, agricultural, and undeveloped. Occasional single family homes are situated on the adjacent roads, with a major subdivision located further east on Mystic Road. A church

is located adjacent to the site on Mystic Road. This area is presently zoned residential.

WATER SUPPLY

For the small subdivision on the southern parcel of this site, individual wells will be most suitable. Wells drilled into the Sterling granitic gneiss should produce quantities sufficient to meet demands. Records of nearby existing wells may give a good indication of the conditions to be expected during installation.

If the remaining portion of the property were to be developed, either individual wells or a community well system would be possible. If a community system is planned, wells located in the sand and gravel areas should produce higher yields than bedrock wells, provided there is a sufficient saturated thickness of sand and gravel. Installation of transmission lines might be difficult in the rocky soils, due to the presence of ledge.

The key to a successful community water supply system is a well organized operation and maintenance program. Problems regarding ownership, repair costs, etc. have created further difficulties in existing systems elsewhere in Connecticut. The State Health Department might be contacted with respect to organizational structures which have been found to be successful. Individual wells would avoid the operational problems of a community system, though the cost may be higher.

WASTE DISPOSAL

Since municipal sewers are not anticipated in this area for the immediate future, on-site sewage disposal systems will be necessary. With the proximity to the Assekonk Swamp, the necessity for properly designed and operating systems is even greater than usual. The soils give a good indication of the difficulties to be expected with the installation and operation of septic systems.

From the soils limitations chart in the Appendix, 41.3% of the soils on this site have very severe limitations for on-site sewage disposal systems. All of these soils are very poorly drained and are either part of or drain into Assekonk Swamp. The remaining 3.4% of the site falling within the inland wetlands category are poorly drained with severe limitations. None of the inland wetlands here should be developed. A vegetated buffer strip of about 200 feet in width along the border of the wetlands is recommended to further protect the swamp from siltation and/or pollution arising during or after construction on the adjoining uplands.

The rocky soils, comprising 23.9% of the site, have severe limitations for sewage disposal. This is due primarily to the rockiness, shallow depth to bedrock, and occasionally steep slopes. However, as described earlier, deep pockets of soil will occur within

these areas. Before determining house or lot locations, a backhoe should be used to identify suitable sites. This will probably result in large lot sizes.

Hardpan soils, 16% of the site, also have severe limitations for on-site sewage disposal. This can be directly related to the seasonal high water table and generally poor drainage characteristics of the hardpan. Drainage and fill are measures commonly used to help overcome the limitations. Again, large lot sizes will be necessary to accomodate adequate systems and their reserve areas.

The upland till soils (10.9% of the site) range from slight to severe limitations for on-site sewage disposal, with the majority being severe. This primarily reflects the steepness of the slopes. The steepest area, 52D, is located in the area to be subdivided. However if the houses are placed along the road, the septic systems will probably not be located in these soils.

The homes in the small subdivision will probably be located in the rocky soils. Further information regarding seepage rates, depth to bedrock, topography, etc. will be required before the septic systems can be approved. The Southeastern Regional Office of the State Health Department would like to have their personnel on the site at the time of testing.

FOUNDATION DEVELOPMENT AND GRADED CONDITIONS

The soils map indicated slight to severe limitations for the installation of basements. The major limiting factors are shallowness to bedrock, stoniness, slope, and seasonal high water table. With careful site selection, design, and/or drainage measures, these problems can be avoided or minimized.

It is important, if differential settlement is to be avoided, that the material upon which the footing is placed have an adequate and fairly uniform load bearing capacity.

Footing drains may be necessary on the hardpan soils and other soils with seasonal high water tables.

The limitations for landscaping will be minimized with large lots, such as those being proposed (5 acres), since most of the lot will not be disturbed. If a more intense development should be proposed for the remaining area, erosion control should be a part of the overall plans. The developer's method of construction can do much to minimize erosion. This includes practices such as keeping as much of the area as possible in its natural state, clearing only what land is necessary for the continuance of work, protecting cleared areas with temporary or permanent seeding, and using appropriate protective measures. The Erosion and Sediment Control Handbook for Connecticut (available from the County Office of the Soil Conservation Service) gives standards and specifications for numerous measures, as well as guidelines for their use.

Surface drainage should not be a major problem, but runoff from the roofs and paved areas may cause erosion on the steep slopes, if allowed to concentrate at any particular point. Again, if a more intense development is proposed for the remaining land, surface drainage plans will be necessary.

ROADS AND UTILITIES

For the small subdivision proposed, the existing road system should be adequate. Visibility should be considered when placing driveway entrances along Jeremy Hill Road. In any future development, new roads on the site should be planned and constructed using sound engineering principles. Consideration should be given to the degree of slope, subsurface drainage, and storm water systems. Cut and fill slopes should be flat enough to establish and maintain erosion resistant vegetation (generally not steeper than 1 vertical to 3 horizontal). The method of construction should be flexible enough to permit the least amount of exposed soils open to the elements during any one construction period.

POTENTIAL HAZARDS

Any construction within Assekonk Swamp could be subject to flooding and could increase the flood potential in the surrounding area and downstream. This is one of many reasons for avoiding construction in significant wetland areas.

Damage to Assekonk Swamp from siltation, septic pollution, loss of wildlife habitat, etc. is a possibility, but can be avoided. Proper design and construction of septic systems are mandatory. In areas of moderate density, erosion control and surface drainage plans should be developed. Direct introduction of runoff into the wetlands or streams should be avoided. Leaving a 200 foot or more buffer strip around the wetlands will provide additional protection from siltation or pollution. It will also preserve some of the existing upland wildlife habitat which contributes to the overall value of Assekonk Swamp.

AESTHETICS AND PRESERVATION

For the six lots presently being proposed by the owners, there should be little negative impact, provided a 200 foot buffer strip is left between the wetlands and any construction, septic leaching fields are carefully located, and only the actual construction areas are cleared of vegetation.

However, the proposed subdivision only represents about 20% of the entire property that may, at some future date, be subject to development. The high degree of soils with severe and very severe limitations for any type of development should serve as a caution for the need of careful planning of any future construction.

The farm has many scenic features that should be preserved in any development, such as the copses of trees, red cedar, and stone walls. The rolling topography and the open fields give the farm a beautiful English quality. Any development that occurs should preserve these features by grouping or clustering, where possible.

The woods along the edges of the property define the scenic features. Any proposed development that occurs within them should be done in such a way that much of the tree cover is preserved. The preservation of the old house on the site would add another scenic dimension. From the surrounding hills, this site is quite visible. This further reinforces the need to preserve its rural character.

As described earlier, Assekonk Swamp is a State-owned wildlife management area receiving heavy year round use. Also a 15 acre portion of the State Forest is leased to the town for recreation use and a firehouse. Wheeler High School is also located near the swamp. With this in mind, it would be in the town's interest to protect the integrity of the area for the recreation and education of present and future generations. Maintaining a 200 foot buffer zone along the wetlands border and careful planning of any future development on the upland areas of the Lower Farm should provide the necessary protection for Assekonk Swamp.

COMPATIBILITY OF SURROUNDING LAND USES

Since the immediate surrounding land uses are residential, agricultural, undeveloped, or part of the State Forest, low density residential development such as that being proposed should be compatible. With proper safeguards, residential development on the remaining area would also be compatible.

ALTERNATIVE LAND USES FOR THE AREA

Lower Farm seems best suited for its present agricultural activity or very low density residential use. The six proposed lots of 5 acres each should be suitable. Based on the complex soil conditions and varying topography on the remaining property, further information will be necessary to determine the number of homes the land might be able to support. Information regarding hardpans, seasonal high water tables, depth to bedrock, stoniness, slopes, and percolation rates will dictate how much development is feasible. On-site percolation tests should be conducted and observation pits dug for each intended housing site before determining lot size or boundaries. Such information could aid in preventing further drainage and sewerage problems such as those that presently exist in the Kingswood subdivision to the east.*

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* Sewerage Problems, Southeastern Connecticut Regional Planning Agency, 1965.

ADDITIONAL COMMENTS

It would appear that the presently proposed subdivision should pose no critical problems with regard to the protection of Assekonk Swamp. However, it is strongly recommended that both here and with any future development along this wetland area, that an undisturbed buffer strip of vegetation be preserved for a distance of 200 feet from the edge of the wetlands. Also, as should be the case in any development, placement and design of septic systems should be very carefully controlled and supervised.

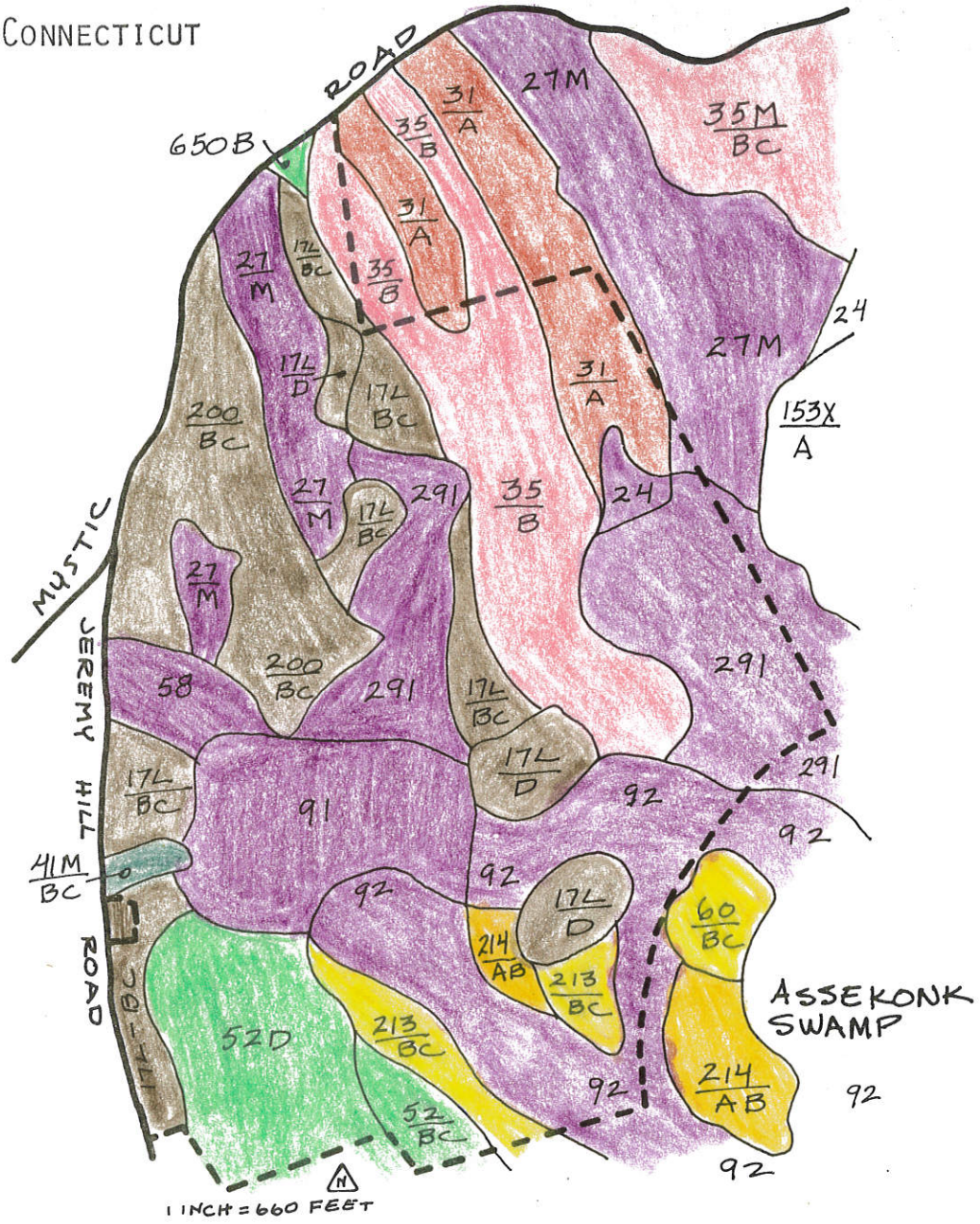
With any future development on the rest of Lower Farm, on-site testing should precede any final layout of lots. It is expected that only a low density development would be feasible, though specific numbers cannot be determined without more detailed information.

APPENDIX

SOILS MAP

LOWER FARM

NORTH STONINGTON, CONNECTICUT



Prepared by: UNITED STATES
DEPARTMENT OF AGRICULTURE

Soil Conservation Service

ADVANCE COPY, SUBJECT TO CHANGE

JUNE, 1974

SOILS LIMITATIONS CHART

Natural Soil Group*	Mapping Symbols	Acres	Percent of Total Acres	Limitations For:** On-site Sewage	Base ments	Land-scaping	Streets and Parking	Principal Limiting Factor(s)
A-1b	213BC	5.5	3.5	1	1	2	2	Droughtiness, slope 3-15%
A-2	214AB	1.5	1.0	3	2	2	2	Seasonal high water table
A-3b	91	16.0	10.3	4	4	4	4	High water table, organic material.
B-1a	650B	.5	.3	1	1	1	2	Slope 3-8%.
B-1c	52BC	2.3	1.5	2	2	3	3	Stoniness, slope 3-15%.
B-1e	52D	13.2	8.5	3	3	4	4	Stoniness, slope over 15%
B-2b	41MBC	1.0	.6	3	2	3	3	Seasonal high water table stoniness, slope 3-15%.
C-1a	35B	19.5	12.6	3	1	1	2	Hardpan, slope 3-8%.
C-2a	31A	5.2	3.4	3	2	2	2	Hardpan, seasonal high water table.
C-3a	24	1.3	.8	3	3	3	3	High water table.
C-3b	27M	9.6	6.2	4	4	4	4	High water table, stoniness.
D-1	17LBC, 200BC	30.5	19.7	3	3	3	3	Shallowness, slope 3-15%.
D-2	17LD	6.6	4.2	3	3	4	4	Shallowness, slope over 15%.
E-3a	58	4.0	2.6	3	3	3	3	Variable drainage and texture.
F-1	92	18.0	11.6	4	4	4	4	High water table, organic material.
G-3b	291	20.5 / 155.2	13.2 / 100.0	4	4	4	4	High water table.

* Refer to Know Your Land, Natural Soil Groups for Connecticut, Soil Conservation Service, USDA Connecticut Cooperative Extension Service, for further explanation of the natural soil groups.

** Limitations: 1-slight; 2-moderate; 3-severe; 4-very severe.

69.4 ac. 44.7%

ACREAGE SUMMARY OF SOILS LIMITATIONS

	Slight		Moderate		Severe		Very Severe	
	Acres	%	Acres	%	Acres	%	Acres	%
On-site sewage	6.0	3.8	2.3	1.5	82.8	53.4	64.1	41.3
Basements	25.5	16.4	10.0	6.5	55.6	35.8	64.1	41.3
Landscaping	20.0	12.9	12.2	7.9	39.1	25.2	83.9	54.0
Streets and Parking	-	-	32.2	20.8	39.1	25.2	83.9	54.0