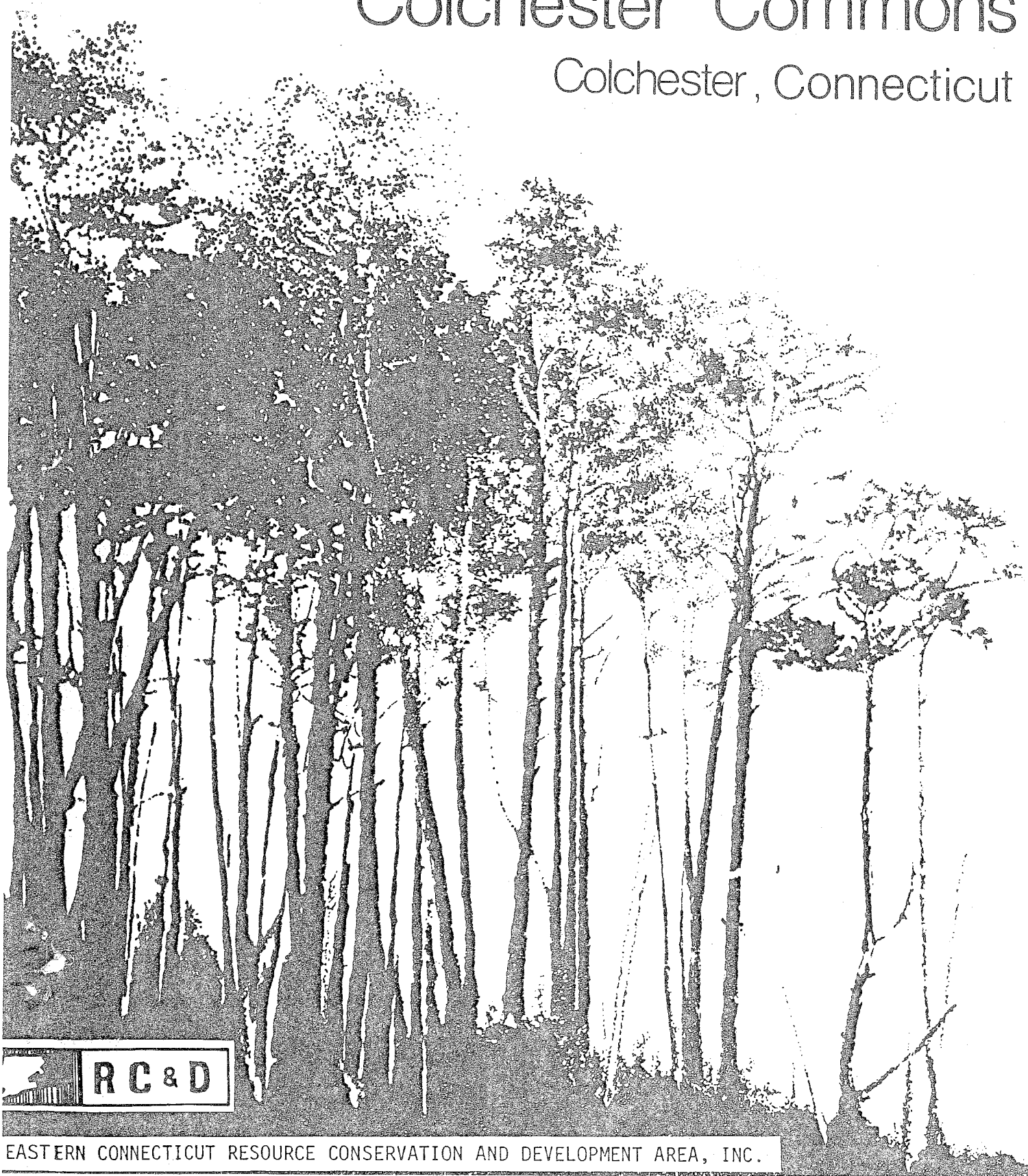
Environmental Review Team Report

Colchester Commons

Colchester, Connecticut



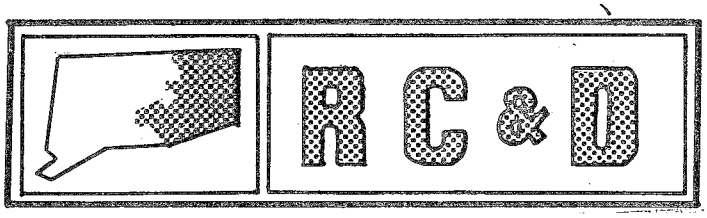
R C & D

EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

Environmental Review Team Report
on

Colchester Commons
Colchester, Connecticut

May, 1982



eastern connecticut resource conservation & development area

environmental review team
139 boswell avenue
norwich, connecticut 06360

As a result, runoff from the site will increase. Peak flows in the receiving streams will also be increased to some extent unless protective measures are employed.

It is possible to estimate the hydrologic changes that will occur by using the runoff-curve number method, as outlined in SCS Technical Release Number 55. The table below shows the average runoff depths for various major storm frequencies, both before and after development.

Table 1. Average Runoff Depths in Inches

Storm Frequency	2-Year	10-Year	25-Year	50-Year	100-Year
Runoff depths before development	0.76"	1.78"	1.99"	3.18"	4.04"
Runoff depths after development	1.02"	2.17"	2.38"	3.68"	4.58"
Percentage increase in runoff after development	34%	22%	20%	16%	13%

The substantial increases estimated above, point to the need for careful erosion-and-sedimentation controls. The stated intention of the developers to leave as many trees as possible in the parcel will help to maintain the infiltration capacity of the soil. The wetland areas on and near the site will help to trap sediment leaving the property. This may be particularly important since there is a pond along the watercourse that drains the northern portion of the site; the pond is on an adjacent parcel.

The increases in peak streamflows would have a restricted impact since the land around Hall Brook downstream from the site is only lightly developed. The most noticeable effect of these increases would probably be temporarily elevated water levels in the wetland on and near the site during major storms. Of particular concern would be the wetland along the access strip, since this wetland backs up against adjacent residential lots to the northeast. Peak flows for pre-development and post-development conditions at the culvert along the access strip were estimated by the runoff curve-number method. The results are shown below.

Table 2. Peak Flows, in Cubic Feet per Second, at the Culvert Along the Access Strip.

Storm Frequency	10-Year	25-Year	50-Year	100-Year
Pre-development peak flows	49	58	101	140
Post-development peak flows	58	68	115	158
Percentage increase in peak flows after development	18%	17%	14%	13%

The Team recommends that the developers analyze the effects of the development on flood storage in the wetlands on and adjacent to the access strip. Specifically, the developers should determine how much of the storm flows would be passed through the proposed twin 24-inch pipes and what storage volume would be required to the north of those pipes for storms of various frequencies. These analyses will indicate whether nearby residential properties would in fact be affected by the increased flows and wetland storage. With the exception of these possible effects, the avoidance of the wetlands for development purposes and the usage of the wetlands for temporary floodwater storage are desirable aspects of the proposal.

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 feet/inch scale to 660 feet/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 gently sloping well drained outwash plains and stream terraces are occupied by Agawam fine sandy loam. This soil is designated on the soil map by the soil mapping symbol 96B. The letter "B" denotes slope as 3 to 8 percent. Agawam soils formed in water sorted sands. The soils have moderately rapid permeability in the surface layer and subsoil, and rapid permeability in the substratum. Surface runoff is medium. Agawam fine sandy loam qualifies as Prime Farmland soil in Connecticut.

The gently sloping well drained uplands are occupied by Canton and Charlton very stony fine sandy loams. This soil is designated by soil mapping unit symbol 11XB. The letter "X" denotes a very stony surface condition. The letter "B" denotes slopes as 3 to 8 percent. Canton soils formed in a fine sandy loam mantle underlain by friable gravelly sandy glacial till. Canton soils have moderately rapid or rapid permeability. Surface runoff is medium. Charlton soils formed in friable glacial till. Charlton soils have moderate to moderately rapid permeability. Surface runoff is medium to rapid.

The gently sloping to sloping land forms adjacent to the highest elevations in the landscape are occupied by Charlton-Hollis fine sandy loams, very rocky. The soil mapping unit symbol is 17LC. The letter "L" denotes very rocky, and "C" denotes a slope range of 3 to 15 percent. Both these soils are well drained. Charlton soils formed in deep, friable glacial till and the Hollis soils formed

in shallow glacial till less than twenty inches deep over bedrock. Charlton soils have moderate to moderately rapid permeability and the Hollis soils have moderate permeability. Surface runoff is medium to very rapid for Hollis soils and medium to rapid for Charlton soils.

The nearly level and gently sloping, moderately well drained stream terraces and outwash plains are occupied by Ninigret fine sandy loam. Ninigret fine sandy loam is designated by soil mapping unit symbol 25A. The letter "A" denotes slopes as 0 to 5 percent. Ninigret soils formed in water sorted outwash. They have moderately rapid permeability and a seasonal high water table at 18 to 24 inches. Surface runoff is slow to moderate. Ninigret fine sandy loam qualifies as Prime Farmland in the State of Connecticut.

The nearly level poorly drained stream terraces and outwash plains are occupied by Raypol silt loam. Raypol silt loam is designated by soil mapping unit symbol 464. They formed in silty deposits, less than forty inches thick over sand and gravel. Raypol soils have moderate permeability in the surface layer and subsoil, rapid or very rapid permeability in the substratum, and a high water table at or near the surface 7 to 9 months of the year. Surface runoff is slow. Raypol is designated as a regulated wetland soil according to P.A. 155.

The low lying, nearly level areas along drainageways in the uplands are occupied by Ridgebury, Leicester and Whitman extremely stony fine sandy loams. The soils are designated by the mapping unit symbol 43M. The letter "M" denotes extremely stony. The Ridgebury and Whitman soils formed in compact glacial till; the Leicester soils formed in friable glacial till. The Ridgebury and Leicester soils have moderate to moderately rapid permeability in the surface layer and subsoil and slow or very slow permeability in the substratum (fragipan). The Leicester soils have moderately rapid permeability throughout. The seasonal high water table for Ridgebury and Leicester soils is at or near the surface 7 to 9 months of the year. The Whitman soils have high runoff potential. Runoff is slow to medium in Ridgebury soils and slow in Leicester soils. This soil is designated as a wetland soil and is regulated under Public Act 155.

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 eighteen to twenty-four inches. Surface runoff is slow to medium.

The nearly level to gently sloping, extremely stony, moderately well drained areas on uplands are occupied by Sutton extremely stony fine sandy loam. This soil is designated by soil mapping unit symbol 41MB. The letter "M" denotes an extremely 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 eighteen to twenty-four inches. Surface runoff is slow to medium.

The preliminary plan shows 112 mobile home units on lots of one-half acre or greater. Each unit will have its own on-site septic disposal and a community

well will be developed. Approximately 14 percent of the site is wetlands and is not planned for future development. The largest wetland in the eastern part of the development will probably be receiving most of the storm water runoff. Approximately 43 percent of the site has severe limitations to on-site sewage disposal because of seasonal high water tables or water at or near the surface most times of the year. These limitations are further reinforced by the information in the test pit logs. Aside from the wetlands, the other soils, such as the Sutton soils and Ninigret soils, can be utilized for sewage disposal but may need special systems to overcome the limitations.

Other soils on site that pose limitations to development are the Charlton-Hollis soils that are a complex of deep and shallow soils. The Charlton soils are well drained and usually over forty inches deep, while the Hollis soils are termed shallow with bedrock at or within eighteen inches of the surface. Obviously, the Hollis soils have severe limitations to most uses. The occurrance of Hollis soils on site may also have an affect as to the number of units that can actually be built on site with on-site sewage. Other problems encountered with this soil are road location and burying utility lines. Road relocation and careful siting of mobile units are methods of overcoming these limitations.

The soils that are moderately well drained (Ninigret - 25A, and Sutton 41MB, 41XB) also pose a potential frost heaving problem. This is especially crucial when siting homes without basements on concrete slabs. Frost heaving can also damage utility and water lines that are not buried to proper depths.

Most of the homes proposed around the major wetlands in the eastern portion of the property are less than 100 feet from the wetlands and often times no greater than 50 feet from the wetlands. The location of septic systems in these cases will be important since the water table does rise along the edge of the wetlands. To avoid potential groundwater contamination, the systems may have to be located in front of the mobile homes. The community wells will be located on sandy outwash soils or coarse grained glacial till soils, which have a seasonal high water table. The community swimming pool, community building and utility building will be located on similar soils within 200 feet of the wells. The nearest mobile home is approximately 150 feet away. The substratum hydrology should be evaluated in this area to determine if pumping the well will draw waste water and effluent towards the well. An analysis of the well drawdown curve will be important in answering this question.

A sediment and erosion control plan should be developed and submitted for review as part of the final plan. The review of the plan can be done by the New London County Soil and Water Conservation District.

VEGETATION

The tract of land for this proposed development may be broken into seven decernable vegetative types. Some of the vegetation boundaries follow the soil type changes and others are more dependent on soil depth. The general boundary lines are delineated on the accompanying illustration.

Type 1. Open Field Land. Actively managed containing various grasses.

Type 2. Mixed Hardwood, wet to very wet with a very high predominance of red maple. The wet areas have trees and brush growing on hummocks to areas of mixtures of red maple and oak. The overstory is mostly red maple with a scattering

Vegetation

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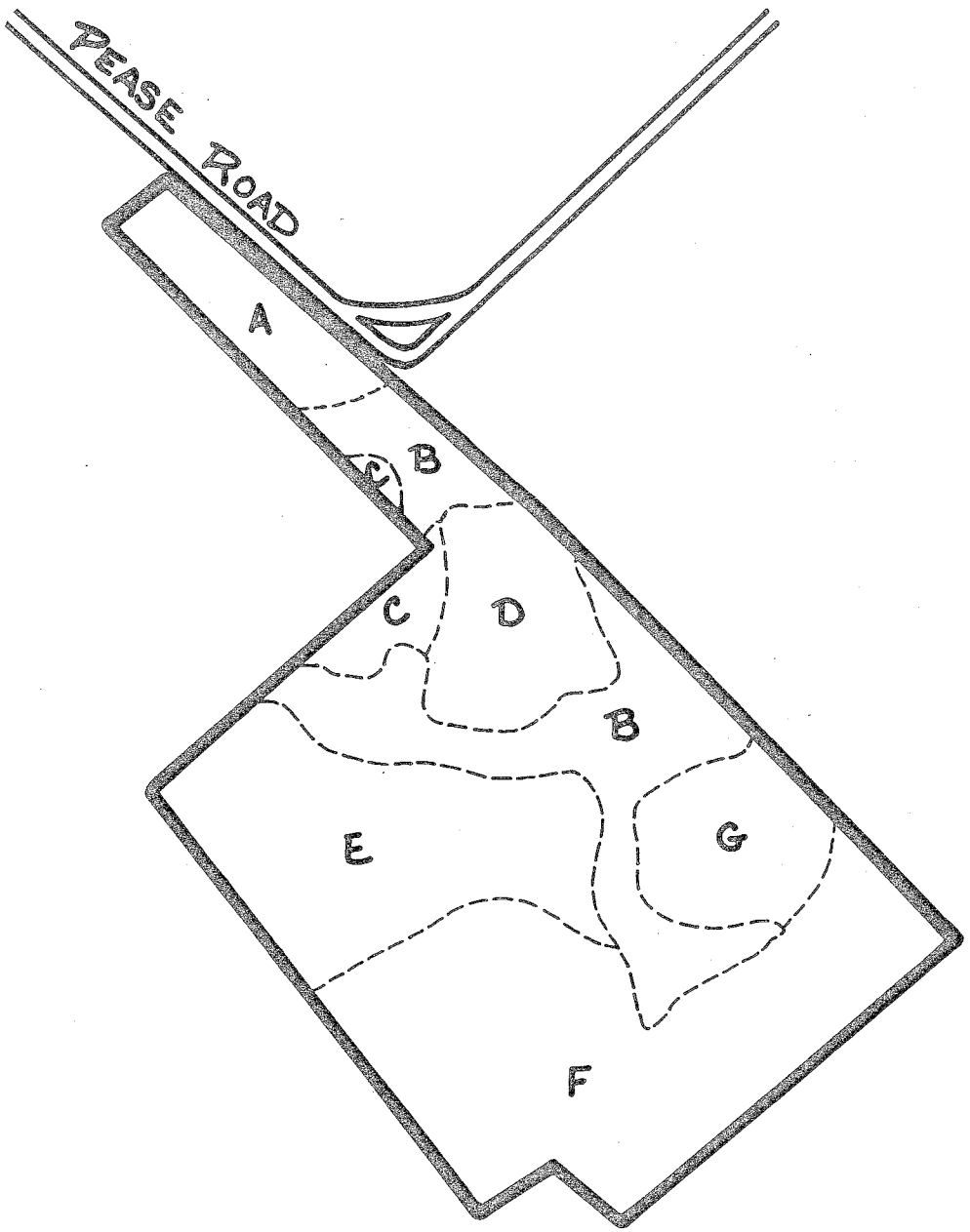
scale

N



LEGEND

Vegetation type boundary

Site boundary

Road

VEGETATION TYPE DESCRIPTIONS *

Type A. Open Field.
Type B. Mixed Hardwood (wetland).
Type C. Old Field.
Type D. Mixed Hardwood (oak, big-tooth aspen, red maple, black birch).
Type E. Mixed Hardwood (red oak, black oak).
Type F. Mixed Hardwood (densly populated).
Type G. Mixed Hardwood (oak, maple, black birch).

of yellow birch, black birch and American elm. The understory is mostly spice bush with coast pepperbush and some highbush blueberry. Herbaceous vegetation includes skunk cabbage and sedges in the more open areas. Since these areas will not be disturbed by the development, there should be no work done in them at this time. Once the development is established, light firewood thinnings by the people in the area would be the best management approach.

Type 3. This is an Old Field type that has rather recently reverted from a pasture or field and still contains many of the pioneer species. The overstory contains red cedar and a mixture of hardwoods including black oak, scarlet oaks, pignut hickory, gray birch, black cherry, black birch and large toothed aspen.

Most of these trees are fairly small in diameter and are not overcrowded. Care should be taken during development to displace as few of the red cedars as possible as they are the only natural conifers in the area. Some of this area is scheduled to be cleared as a parking lot for recreation vehicles, but the existing red cedars supplemented with additional plantings of white pine will make an attractive natural screen for the area.

Type 4. This was a Mixed Hardwood stand with a main tree stand of trees from six to twenty inches in diameter. Most of the trees twelve inches and greater in diameter have been removed, leaving a ragged, understocked stand. Many of the residual stems will be twisted and broken because they do not have any natural support from the trees that were cut. It will be a number of years before this area will take an appearance of well forested area.

There is a wide variety of species in this area. The overstory consists of red maple, black oak, white oaks, black birch, large toothed aspen, with occasional pignut hickory and white birch. The understory varies from light to very dense in places. Species include black birch, red maple, sassafras, black oak, white oaks, highbush blueberry, species of azalea, coast pepperbush, and some spice bush.

There is little that can be done to improve this area, except to landscape the individual lots, removing broken trees and encouraging natural regeneration.

Type 5. This is a Mixed Hardwood stand containing predominately black and red oak with a scattering of red maple, occasional yellow or black birch. This stand has also been cut very heavily. The understory consists mainly of sprout growths of red maple, black oak and black birch stumps. There are a few highbush blueberries and considerable coast pepperbush coming in. This area will require considerable landscaping work to develop desirable wooded house lots.

Type 6. This is a much more dense stand. Most of the trees are black oak or scarlet oak with a few white oaks, red maples and black birches. Because of the higher and poorer site condition these trees did not grow as fast and so had a smaller average size. With smaller size trees, the area was not cut as heavily and so a good stand remains.

There is very little understory except where trees have been cut and allowed a growth of red maple, black birch and coast pepperbush to develop.

If thinned carefully, this will be quite a pleasing woodland setting.

Type 7. This Mixed Hardwood stand is about halfway between #5 and #6. It is predominately an oak stand, but there is more red maple and black birch than in #6 and it is cut heavier; however, except for a few large openings, there is a good woodland setting.

The "Vista area" concept, although nice in the planning stage, could cause problems to implement. Just thinning the woods will promote a great deal of undergrowth which would soon negate the vista unless it was cut back on a bi-annual basis. Thinning, leveling, filling and planting grass could be very detrimental to the residual stand. Trees that have been growing under adverse conditions, i.e., overcrowding or dry conditions, are more readily damaged or killed when fill is added to an area.

Unfortunately, so much of the area has been cut so heavily that many of the lots will require some tree planting to achieve the planned affect of the woodland setting. There are seedlings and saplings that could be nurtured into developing good trees. Care should be taken to remove trees with open decay showing in the base, as they would have high risk of blowing over in a wind storm.

WATER SUPPLY

The developers have indicated that the mobile homes would probably be a mix of one- and two-bedroom units. The Department of Health Services uses population estimates of two persons per bedroom, and usage estimates of 75 gallons per person per day to determine potential water supply need. If it is assumed that one- and two-bedroom units will be equally provided (i.e., 56 one-bedroom units and 56 two-bedroom units), the population estimate would be 336 persons, and the usage estimate would be 25,200 gallons per day. In order to provide this much water within an 18-hour period, the on-site well or wells that would be used would have to have a sustainable yield of 24 gallons per minute.

Although there may be some coarse-grained stratified drift along the northwestern boundary of the property, where the wells are now proposed to be installed, it seems unlikely that the deposits will be adequate to provide a sustainable yield of 24 gallons per minute. Test-hole records for the area near the proposed well site show up to eighty inches of "silty sand," which does not appear to be a rapidly permeable medium. Moreover, during the normally dry late summer months, the drawdown required in the well(s) to produce 24 gpm continuously may not be available, depending on the total depth of the well. If the developers, after further on-site testing, decide to try a "shallow" (i.e., non-bedrock) well, pump tests should be run for a period of at least several days during late July or August to see whether the required yield can be sustained. If more than one well is dug, each well should be monitored during the pumping of any individual well to determine whether mutual interference is occurring among the wells. Closely spaced shallow wells are likely to experience such interference.

Although bedrock is more likely to provide reliable yields to this development, the sustainable yields of each well will probably be relatively small. Most bedrock wells can supply at least 2 or 3 gpm, but few wells drilled in schist can yield 20 gpm. Moreover, the local schist often produces water with a reddish or brownish color, or with a strong sulfur smell. On the other hand, bedrock wells would be better protected from possible contamination by septic-system effluent or road salt. If bedrock wells are used, perhaps as many as five will be needed.

WASTE DISPOSAL

The Borough and portions of the town of Colchester in conjunction with a neighboring community are presently engaged in the final construction and installation phases of a municipal sewerage system. However, as the property in question is located on the outskirts of town, future sewering of this more remote area is not anticipated. Therefore, for the long term, there will be continued reliance on the land area to support proper on-site subsurface sewage disposal.

As noted, each mobile home unit (typical unit 14' x 70'), including the community building, would be serviced by individual subsurface sewage disposal systems.

Based on visual topographical conditions and review of soil mapping information along with the engineer's preliminary soil test findings, it is apparent that the property has varying subsoil conditions. Limiting factors of wetlands, and surface of shallow underlying bedrock, are particularly evident towards the northeastern and higher south, southeastern sides. In addition, some soils are poorly drained with evidence of elevated groundwater. This is not to imply, however, that all areas are not favorable or suitable for this purpose. According to Soil Conservation Service information, there are land areas where the soils have only slight to moderate limitations and should impose no major restrictions for sewage disposal.

The Public Health Code requires that bedrock and groundwater be at sufficient depth in order not to interfere with the proper functioning of septic leaching systems. For this purpose, the bottom area of any type of leaching facility is to have a minimum separating distance of 1 and 1/2 feet above bedrock and maximum groundwater level, respectively. In addition, there are minimum horizontal space requirements from drains, streams, bodies of water, etc. In this regard, it is understood the local regulations are more stringent, requiring buildings to be 50 feet from wetlands while sewage leaching systems are to be located 100 feet away from such area.

In view of these conditions and the limited amount of on-site testing for a development of this size, it would appear premature to generally conclude that all of the projected number of sites would be acceptable for sewage disposal and meet the various provisions of state and/or local codes.

No doubt some marginal sites would require special engineering design while others may not have sufficient available area which would meet required separating distances. A more comprehensive testing program would be recommended with the probability that some modifications would be needed for the layout of individual sites and overall density.

PLANNING CONCERNS

Surrounding land uses are low-density residential and undeveloped in Lebanon and agriculture-undeveloped in Colchester. A new development at one-half acre or greater per unit will change this character, but the 200 foot buffer requirement will mean that the proposed development will not be visible

from Route 16 in Colchester. Supporting governmental and commercial services are located in the Borough of Colchester about three miles southwest of the site. Lebanon center is located about five miles northeast of the site.

Route 16 has a fairly low traffic flow in this area, with a 1980 average daily traffic of 1,350 in Colchester. Route 16 east of Colchester Borough is scheduled for improvements and upgrading in the Regional Transportation Plan. Some improvements have been made in recent years, but the upgrading process has not been completed. A report called Trip Generation by Land Use* indicates a trip rate of 3.27 per dwelling for a retirement community. If this figure is employed, 112 units would generate 366 new daily trips, an increase of about 25 percent in traffic for Route 16.

The special exception provisions dealing with mobile homes in the Colchester zoning regulations do not mention age restrictions. If this is planned as an elderly community, the Planning and Zoning Commission should ensure that occupancy is limited to elderly persons. Most likely, this would be the responsibility of the zoning enforcement officer. On some periodic basis, he will have to inspect the records of the mobile home park owner to determine that the age requirements specified by the Planning and Zoning Commission are met.

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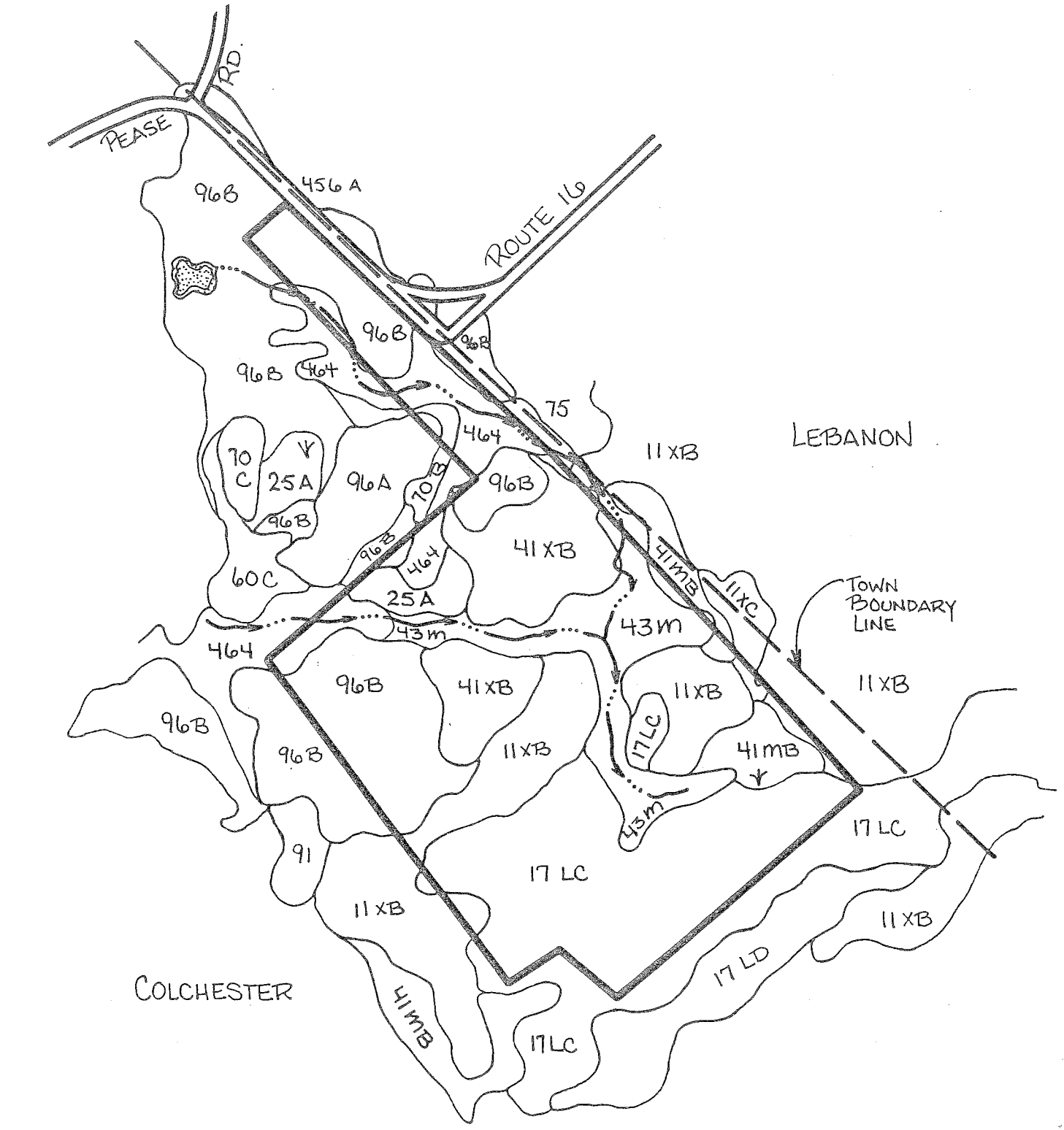
* Trip Generation by Land Use, Maricopa Association of Governments, April 1974.

Appendix

Soils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COLCHESTER

COLCHESTER COMMON
COLCHESTER, 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
Agawam	96B	21	20%		1	1	1	1
Canton-Charlton	11XB	12	12%	Large stones	2	2	2	2
Charlton-Hollis	17LC	26	25%	Slope, large stones				
Charlton Part					2	2	2	2
Hollis Part					3	3	3	3
Ninigret	25A	3	3%	Wetness, Frost Action	3	3	2	1
Raypol	464	9	9%	Wetness, Frost Action	3	3	3	3
Ridgebury, Leicester and Whitman	43M	14	14%	Wetness, Large Stones	3	3	3	3
Sutton	41MB	3	3%	Wetness, Large Stones, Frost Action	3	3	2	1
Sutton	41XB	15	14%	Wetness, Large Stones, Frost Action	3	3	2	1
		103	100%					

LIMITATIONS: 1=Slight; 2=Moderate; 3=Severe.

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.