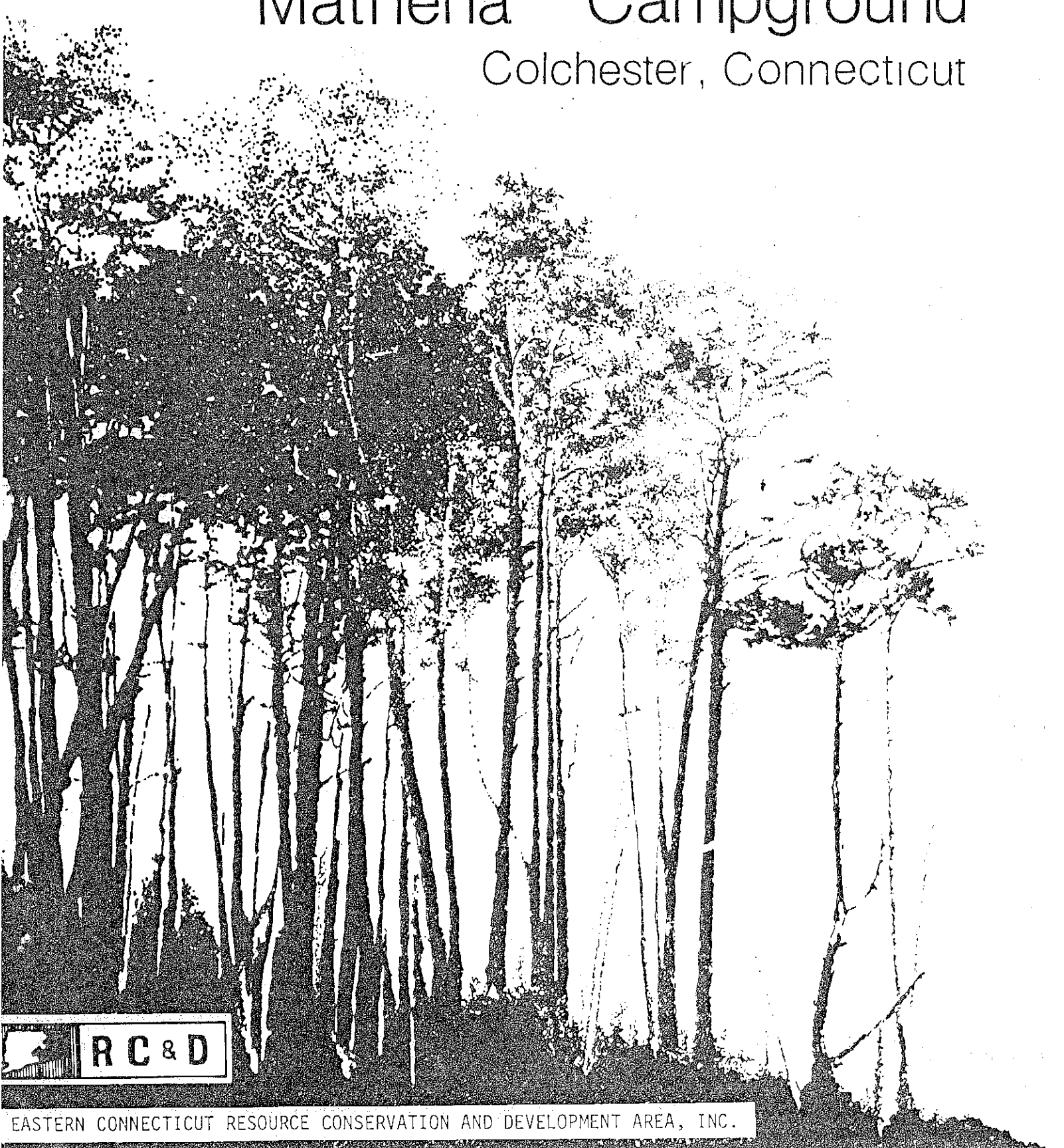


Environmental Review Team Report

Mathena Campground

Colchester, Connecticut

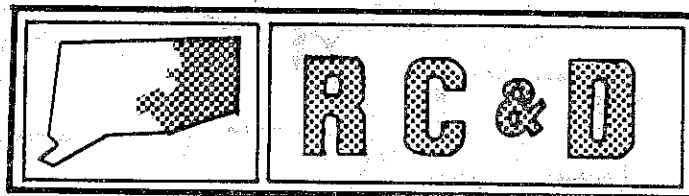


EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

Environmental Review Team
Report
on

Mathena Campground
Colchester, Connecticut

November 1979



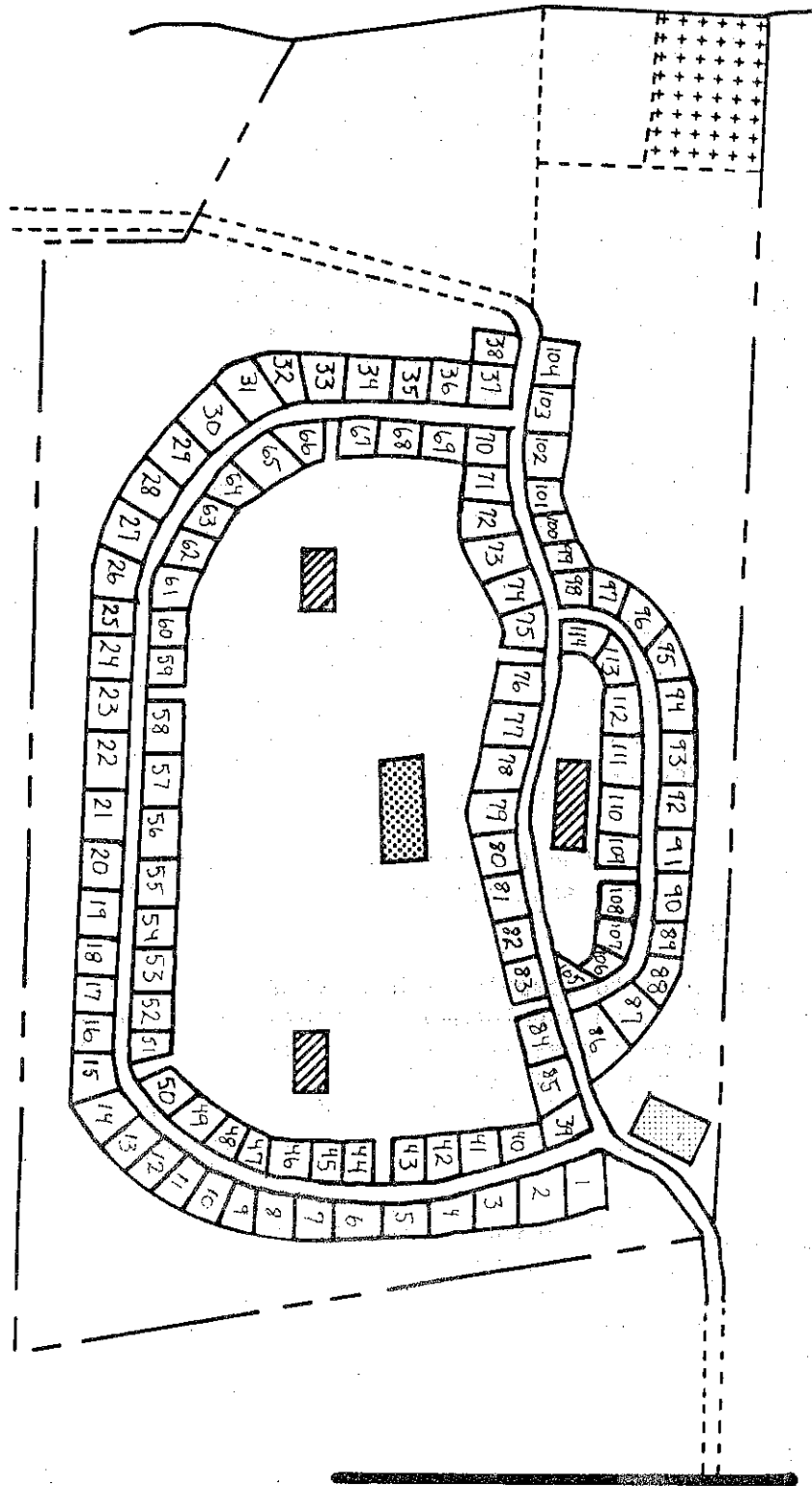
eastern connecticut resource conservation & development area

environmental review team

139 boswell avenue





norwich, connecticut 06360

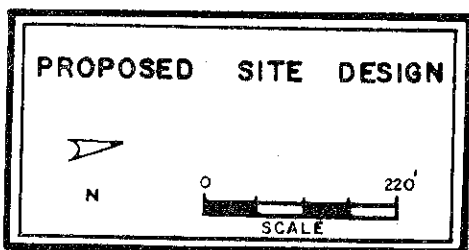
PICKEREL LAKE



ROUTE 149

LEGEND

-  TOILETS-SHOWERS
-  RECREATION
-  OFFICE
-  BEACH-PLAYGROUND



INTRODUCTION

The Eastern Connecticut Environmental Review Team was asked to review a seasonal campground proposal for a 28 acre parcel in Colchester, located on the northeast side of Pickerel Pond. The property is currently in the private ownership of Mark and Shirley Mathena, Colchester residents. A boundary survey and preliminary campsite layout has been prepared by Reinhold Luther, a registered land/surveyor and professional engineer.

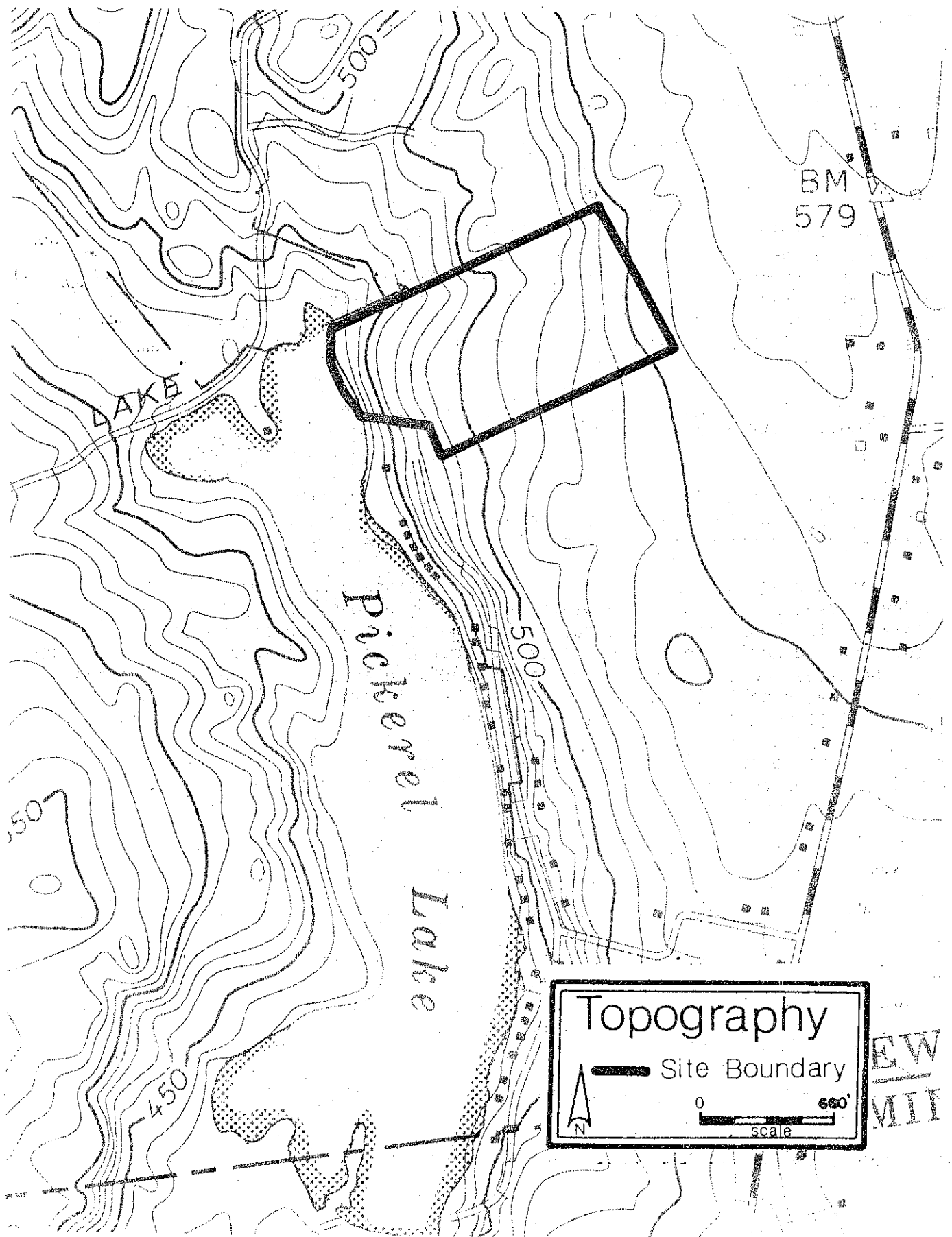
The preliminary plans show 114 campsites, approximately 50' x 50' in size, located on either side of an interior loop road. Three buildings which will house toilets and showers, a recreation center and office are also proposed for the site. A beach and playground for camp residents will be located on the shore of Pickerel Pond. Main access to the campground will be provided from Route 149. Mr. Mathena hopes to establish his home on the property as well, providing a family campground with round-the-clock maintenance.

The site is wooded, and has a steeply sloping topography toward Pickerel Pond. Several pockets of regulated wetland soils are also found on the site. The Team is concerned with the impact of the proposed development on the natural resource base of this site. Although the site is moderately to severely limited for certain development activities, it is possible to overcome these limitations with proper engineering techniques. Proper engineering, however, can be costly, thus making a project economically unfeasible for the developer.

Steep slopes, wetlands and stony soil conditions are the major limiting factors to development of this site. Subsurface draining of wetlands in this area, if allowed by the Town, may not be successful due to the irregular topography of the site. Ponding would probably continue to occur unless considerable fill was brought onto the site. Construction of the campground as planned will cause an increase in surface water runoff (See Hydrology Section of this report). This may in turn increase siltation and eutrophication of Pickerel Pond, if no corrective measures are taken. Design and implementation of a sediment and erosion control plan to alleviate this potential problem is strongly urged. A reduction in proposed campsite density would allow the developer to avoid wetland areas on the site, as well as minimize any erosion potential.

Mr. Mathena's proposal to provide water for the campground from Pickerel Pond is not an acceptable solution to the State Department of Health. Securing sufficient water supply from a well on the property may be one of the most difficult limitations that the developer will have to overcome, due to the quantity of water which a well can supply and the quantities which will be needed at any given time by the campers. (See Water Supply section of this report). Septic systems established on the site may have to be specially designed to allow for the wet and stony soil conditions. Additional soil testing needs to be done before exact location of these systems can be established. To avoid risk of ground water pollution these systems should not be located in wetland areas.

Campground use and the proposed layout complies with the Special Exception use in the Rural Residential District of the Colchester Zoning Regulations. The Team feels that although the proposed use of the site is appropriate, a reduction in campsite density would minimize environmental concerns and allow the developer more flexibility in his layout. The access road serving the site must be con-



structed to Town standards. Although campground use of the site should have minimal impact on surrounding land uses, it may cause more impact on the use of the lake. The proposed campground is in close proximity to the State Boat Launch area which may encourage campers to bring boats with them, generating more boat traffic. The Town should consider regulation of motor size and boat speeds on Pickerel Pond to avoid potential problems to fishermen and swimmers.

ENVIRONMENTAL ASSESSMENT

GEOLOGY

The Mathena property lies within the Moodus topographic quadrangle. A bedrock map (Connecticut Geological and Natural History Survey Quadrangle Report No. 27, by L. Lundgren, Jr., L. Ashmead, and G.L. Snyder, 1971) and a surficial geologic map (U.S. Geological Survey Map GQ-1205, by D.W. O'Leary, 1975) of that quadrangle have been published. The geology of the site consists of two principal components: till and bedrock.

Till is a generally nonsorted and nonstratified glacial deposit consisting primarily of rock particles that were chipped or broken from bedrock exposures or scooped up from preexisting overburden by a moving body of ice. The particles range in size from clay to boulders, with sand being the dominant constituent on the site. The till appears to be loose and granular in most surface exposures but it may be more compact and siltier at depth.

The Brimfield Schist, a rock unit that underlies most of the town of Colchester, is the predominant bedrock type on the Mathena property. The term "schist" refers to the characteristic alignment of platy or flaky minerals in the rock, which allows it to be split rather easily into plates or thin slabs. A rust-stained weathered surface is also typical of the rock as a result of the presence of iron-bearing minerals. The most prominent minerals in the rock, however, are muscovite, biotite, quartz, plagioclase, and garnet.

Numerous large boulders were seen on the site. Bedrock outcrops were observed near the northwestern corner of the property, and bedrock is inferred to be less than 10 feet from the surface in most places.

HYDROLOGY

The entire site drains into the northeastern "bay" of Pickerel Lake. The irregular bedrock surface, only thinly covered by till, has created an irregular drainage pattern of intermittent streams and shallow depressional wetlands. Development of the site will increase runoff and will therefore affect the natural drainage system. The magnitude of the effects will depend upon the ultimate extent of development, e.g. the final number of lots, the amount of forest vegetation removed, etc. A reasonable estimate of the percentage increase in runoff from the site under the current proposal would be 70 percent for a 2-inch rainfall, 40 percent for a 3-inch rainfall, 25 percent for a 5-inch rainfall, and 15 percent for a 7-inch rainfall. These estimates are based on data provided in Technical Release No. 55 of the Soil Conservation Service.

Whereas all of the runoff ultimately would enter Pickerel Lake, as mentioned before, much would be channeled northward along the natural slopes of the present wetland area, then westward in the stream that flanks the site's northern boundary. The developer has proposed draining the wetland by artificial means along the same route in order to accommodate his easternmost campsites. The stream has a considerable lag concentration of boulders and gravel, and probably would be an effective filter to trap much of the sediment generated by the additional runoff. Nevertheless, the irregularity of the eastern section of the site suggests that the water problem will not be easily eliminated - ponding would probably continue to occur during wet seasons unless considerable fill were brought onto the site. It may therefore be most practical to eliminate or at least reposition campsites now planned for the wetland areas. Elimination of the campsites would have the additional benefit of minimizing runoff and erosion increases.

FISH RESOURCES

The campground proposal could affect Pickerel Lake in two ways. Increased siltation could result from erosion of proposed roadways and the banks of the now intermittent stream, which will carry additional runoff once the campground is constructed. An increase in the nutrients entering the lake will result from additional runoff.

The effect of these two changes will be an accelerated rate of eutrophication for Pickerel Lake. The lake presently has dense aquatic vegetation and can ill afford the influx of added silt and nutrients. The lake is shallow and receives little circulation in the summer months when aquatic vegetation grows so rapidly. These factors make the lake a very fragile ecosystem which can easily be adversely affected.

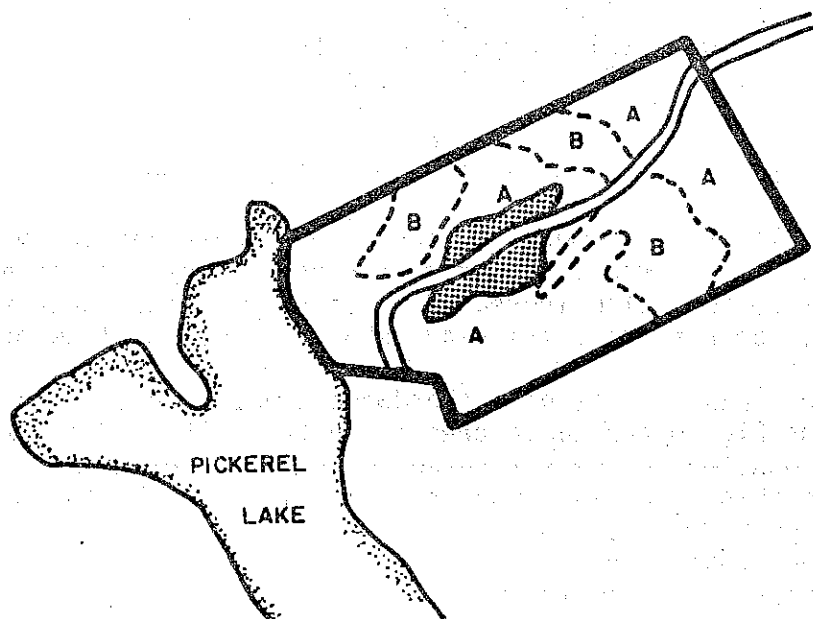
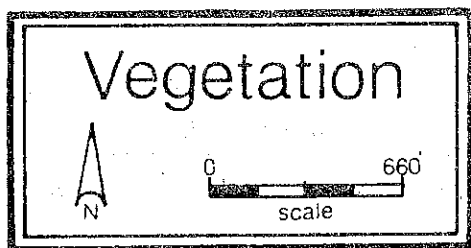
Presently the lake provides good fishing for largemouth bass, white perch, sunfish and bullheads.

VEGETATION

The 28-acre parcel proposed for development into the Mathena Campground complex is completely forested. Mixed hardwoods occupy 22 acres of this property with the remaining 6 acres occupied by hardwood swamp species. Preservation of the largest, healthiest and highest quality trees will improve the overall camping experience provided by this area. The windthrow hazard is severe in the hardwood swamp areas; development in these areas should be avoided. The trees in both stands are crowded and would benefit by a fuelwood thinning.

Vegetation Stand Descriptions

Stand A. (Mixed Hardwoods). This 22-acre, fully-stocked stand is made up of pole-size and occasional sawlog-size black oak, red oak, sugar maple, red maple, black birch, yellow birch and shagbark hickory, with scattered white ash, American elm and black gum. Many of the trees are declining in vigor as a result of the crowded condition in the parts of this stand where clearing operations have not been started. Many of the best shade trees have been removed recently during pre-



LEGEND

- Road
- Property Boundary
- Vegetation Stand Boundary
- Area which has been partially cleared

VEGETATION TYPES*

- STAND A Mixed hardwoods fully-stocked pole and occasional sawlog-size, 22 acres
- STAND B Hardwood swamp overstocked, pole to sawlog-size, 6 acres

* Seedling-size = trees less than 1 inch in diameter at breast height (dbh)
 Sapling-size = trees 1 to 5 inches in dbh
 Pole-size = Trees 5 to 11 inches in dbh
 Sawlog-size = Trees 11 inches and greater in dbh

liminary clearing operations (See Vegetation Map). The removal of these trees has reduced crowding, but it has simultaneously lowered the aesthetic quality of the area. The understory is dominated by maple leaf viburnum, flowering dogwood, witch hazel, and hardwood tree seedlings. Club moss, hayscented fern and Canada mayflower form the groundcover in this stand.

Stand B. (Hardwood swamp). Pole to sawlog-size red maple, white ash and yellow birch are present in this 6-acre overstocked stand. Red oak, tuliptree and black birch are present where this stand grades into the mixed hardwood stand. Many of the trees in this stand have small crowns relative to their height and as a result are somewhat unstable. High bush blueberry, sweet pepperbush and spice bush form a dense understory throughout this area. Ground cover is dominated by cinnamon fern, royal fern, hayscented fern, skunk cabbage, Jack-in-the-pulpit, sphagnum moss and club moss.

The largest and healthiest trees in both stands A and B should be preserved to the greatest extent possible. The preservation of these trees will complement the overall experience provided by this campground. These trees will improve the aesthetics of the area and also provide shade for campsites.

Trees that are to be preserved should be located and marked prior to actual development so individual sites can be planned in relation to these trees.

Preservation of the flowering dogwood in Stand A will also add to the aesthetics of the campground. These trees should be marked so they are not damaged during clearing and construction. The increased sunlight reaching these trees as a result of clearing sites or potential thinnings should stimulate flowering.

Windthrow is a severe hazard in stand B (Hardwood swamp). Root systems are shallow as a result of the high water table present on this site. Trees are unable to become securely anchored in the saturated soils. The height and crowded condition of the trees in this stand increase the potential for windthrow. At present these trees rely on each other for stability. Linear clearings which allow wind to pass through rather than over this stand the thinnings removing more than 1/4 of the trees will increase the windthrow hazard. Clearings of this nature and heavy harvests should be avoided in this area. A light thinning in this stand, implemented during either the winter months when the ground is frozen or the summer months when the ground is somewhat dry, will reduce crowding and increase tree stability over time.

Increased use by campers throughout this property will cause loss of some vegetation through soil compaction, trampling, vandalism and use in camp fires.

Trees which die as a result of soil compaction will become a hazard to campground users.

The loss of groundcover vegetation by trampling may result in increased runoff and erosion causing loss of soil and increased sedimentation and siltation of Pickereel Lake.

Vandalism to trees and vegetation will lower aesthetics and eventually cause hazards as trees die.

Whenever possible, trails should be established along contours, to minimize erosion between points of intensive use. Well-marked trails will limit extensive soil compaction, root injury and trampling of herbaceous vegetation in other areas. The use of woodchips, crushed stone or cinders on trails will reduce soil compaction and help define trails.

Environmental education of the users of this area through signs and handouts should reduce destruction of trees through vandalism.

Fuelwood for cooking and campfires, if made readily available, will reduce loss of valuable vegetation to camper's fireplaces.

Suggested Management of Forest Resources

The trees in Stand A (Mixed hardwoods) are becoming crowded and declining in health and vigor. A thinning removing 1/3 of the total volume in this stand prior to campsite development would reduce competition for sunlight, water, space and nutrients. Over time the health and vigor of the residual trees will improve. In a healthier condition the trees will be less susceptible to damage caused by soil compaction as the area becomes more intensively utilized. A thinning of as much as 1/2 of the volume around campsites, will allow shrub species to grow rapidly and form buffers between campsites.

These shrubs will also limit the number of paths between campsites. These thinnings should increase species diversity overtime.

The stability and windfirmness of the trees in Stand B (hardwood swamp) could be improved if this area received a light thinning. Removal of approximately 1/4 of the volume would allow the residual trees to expand their crowns and root systems making them more stable without substantially increasing the short term windthrow hazard. The high water table in this stand limits harvesting practices to months when the ground is frozen or dry.

Thinnings in both stands A and B should be focused on removing the poorest quality trees (trees that are damaged, show signs of rot, have large seams or have poor form) and trees which are directly competing with the healthiest trees. Whenever possible trees other than red maple should be favored. If these thinnings are implemented, an average of 3 to 4 cords of fuelwood per acre will be generated. Ideally these thinnings should occur before development of this area begins, so that trees have a chance to respond and become more stable.

A publicly employed service forester may be contacted to assist owners in marking these thinnings.

SOILS

A detailed soils map of this site is 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.

Generally, the deep soils without a firm subsoil are found on the west facing slopes, from the pond edge east to approximately 510 feet above mean sea level. Soils with a firm subsoil, referred to as fragipan, are found at a higher elevation and also occupy some west facing slopes.

The low lying nearly level areas along drainage ways in the landscape are occupied by Ridgebury, Leicester, and Whitman extremely stony fine sandy loams. These soils are designated on the Soil Map by the soil symbol 43M. The Ridgebury and Leicester soils formed in friable glacial till and Ridgebury and Whitman are formed in compact glacial till. Permeability in the substratum is slow to very slow in the Ridgebury and Whitman soils, and moderately rapid in the Leicester soils. The Whitman soils have a highwater table at or near the surface 9 to 10 months out of the year, while the Ridgebury and Leicester soils have a highwater table at or near the surface 7 to 9 months out of the year. This soil is an inland wetland soil and is regulated under Public Act 155.

Gently sloping landforms at the base of hills are occupied by Sutton extremely stony fine sandy loam. These soils are designated by the soil symbol 41MB. The soils are moderately well drained and are formed in friable glacial till. Sutton soils have moderate or moderately rapid permeability, and a seasonal highwater table at 18 to 24 inches.

The sloping to moderately steep hills and mounds are occupied by Canton and Charlton very stony fine sandy loams, and Canton and Charlton extremely stony fine sandy loams. These soils are designated by the soil symbols, 11XC, 11MC and 11MD respectively. The symbol 'X' denotes very stony, and the symbol 'M' denotes extremely stony conditions. Both soils are well drained. The Canton soils formed in a fine sandy loam mantle, underlain by friable to loose gravelly sand glacial till. Canton soils have moderately rapid or rapid permeability. The Charlton soils formed in friable glacial till. Charlton soils have moderate to moderately rapid permeability.

The gently sloping landforms higher in the landscape are occupied by Woodbridge fine sandy loam and Woodbridge very stony fine sandy loam. The soils are designated by the soil symbols 31B and 31 XB. The symbol 'X' denotes very stony. The soils are moderately well drained and are formed in compact glacial till. Woodbridge soils have moderate permeability in the surface layer and subsoil, slow to very slow permeability in the substratum (fragipan), and a seasonal high water table at 18 to 24 inches.

The limitations on this site range from moderate to severe, but because of the land use proposed, good management can overcome those limitations. Limitations of steep slopes and stoniness are indicated on the west and southwest portion of

the property. Seasonal high water tables and stoniness are limitations along the northwest corner of the site and in the central and east portion of the site. Wetlands regulated under PA 155 are located in the northwestern section of the property and running through the eastern section of the property.

Campsite and access road development, and a toilet and shower facility are proposed for the largest section of regulated wetlands running through the east portion of the property. The local Inland Wetlands Commission should be consulted prior to disturbing the wetland areas. To overcome problems of wetness, drainage of the area by ditches or underground tile would be necessary. Even with subsurface drainage, fill to elevate campsites may also be needed.

To keep fill requirements low and to reduce pollution potential, planning fewer campsites will be necessary for the wetlands area. An alternative use for the wetlands area on the site would be as a natural area, enhanced by one or two dug-out type ponds, with picnic facilities nearby. A roofed picnic facility would encourage use of the area throughout the season regardless of weather. With proper planning, the wetland areas' natural drainage would not be altered, and a potential source of pollution would be eliminated from the wetlands by relocation of sanitary facilities and additional campsites.

The waste dumping station is planned for location in a soil that has limitations of a seasonal highwater table and also has a fragipan at 18 to 24 inches below the surface. Concrete holding vaults are planned for storage of recreation vehicle sewage waste. Proper management will be critical in maintaining this facility. Engineering of the holding facility should take into account the highwater table and fragipan. If properly managed, pollution in the surrounding area and pond will not be a problem.

Campsites are not planned on the moderately steep slopes that face the lake. The major limitations on these soils are slope and stoniness which have already eliminated campsite development. The area is planned as a natural area for picnicing and for foot traffic access to a small beach area that is planned along the pond. Steps will have to be placed on the steepest parts of the slope, particularly if the footpath is perpendicular to the steeper slopes. The steps will be needed to prevent erosion and the formation of a gully down the slope. Sediment will also be kept out of the lake by this method. The alternative to steps would be to place the foot paths along the contour of the slope, with an occasional "water bar" across the path to prevent water from running down the entire foot path and causing erosion.

Vehicular traffic should be eliminated from the steep slopes, except for maintenance work and emergency access. Water from the slopes above the steep access road should be diverted from the road to prevent gullying and washing out of the road.

On the northwest corner of the property, a small area of moderately well drained soil along the shoreline and a small wetlands area have wetness limitations. This area is planned as a beach playground area along the shore, while leaving the wetlands area undisturbed. The playground and beach area will have to be cleared of large stones prior to use. Natural drainage ways coming down slope should not be blocked by the beach or playground as these drainage ways provide access for runoff water to get to the pond.

WATER SUPPLY

The production of sufficient water to serve the campsites may be one of the most critical problems the developer will have to solve. If 114 sites are being used, an average of 3 people is at each site, and each person requires 50 gallons of water per day to meet his/her needs, then wells yielding at least 17,100 gallons per day would be required. This would necessitate, at minimum, a continuous yield of 12 gallons per minute from the wells(s). This figure is somewhat deceptive, however, since peak demand would be much greater than this; the simultaneous use of 12 showers alone would require approximately 60 gallons per minute.

Bedrock appears to be the only available groundwater-supply source on the site. Yields of 12 gallons per minute are not common in bedrock wells; yields of 2-3 gpm are more typical. Because the yield of any bedrock well depends upon the number and size of water-bearing fractures that the well penetrates, and because these fractures are irregularly and, for the most part, unpredictably distributed, it is very difficult to predict the yield of a well at any specific site. The developer should be aware, therefore, that several wells may be needed to obtain the desired supply. Wells should be spaced more than 300 feet apart where possible to avoid mutual interference.

To solve the peak-demand-period problem, the developer should install water-storage tanks somewhere on the site. A total storage capacity of 3000-5000 gallons would satisfy peak demands of 100-500 gallons per minute for about a half-hour.

The proposed use of pond water to serve the sanitary facilities cannot be approved. Public Health Code Regulation 19-13-B97(c) requires the development of a water supply which is capable of providing water of satisfactory sanitary quality in ample quantity.

WASTE DISPOSAL

Sewage disposal for toilet facilities is to be provided by private, on-site, subsurface sewage disposal systems. The number of fixtures to be provided and the location of the toilet facilities will be determined by the number of campsites developed and the distance from the campsites to such facilities.

Adequate deep observation pits and percolation tests will have to be conducted in areas to be used for subsurface sewage disposal. At the time of the field review, some preliminary test holes had been dug and observed by the local sanitarian. However, it was still unclear, due to soil quality, as to exactly where such sewage disposal systems and toilet facilities were to be located.

In addition to providing adequate toilet facilities for campers, a holding tank dumping station must be provided for accommodating self-contained camping vehicles. Construction of this dumping station shall be in agreement with all pertinent regulations in the State Health Code.

It is understood that only self-contained vehicles will be allowed in this campground and therefore, no campsite sewage disposal systems are to be provided.

All of the general sanitation requirements for this proposed campground will be provided by the owners. Such requirements would include: Refuse removal and

proper disposal, insect control (mosquito control may be of some significance in this area), site improvement and maintenance, beach maintenance, etc.

Mr. Mathena indicated that he would be providing all such services for the campground.

PLANNING CONSIDERATIONS

The proposed recreation campground is permitted as a special exception in R-60 Rural Residential Districts under the Colchester Zoning Regulations. The proposal calls for 114 campsites on the 28-acre tract, well within the maximum number of ten per gross acre permitted by the Regulations. The layout of the campsites conforms to the buffer and dimensional requirements of the Regulations.

Access is proposed from Route 149, which lies about a quarter mile east of the property, over a strip of land owned by the applicant. The Zoning Regulations require that such a lengthy access be constructed to town road standards. The access road meets Route 149 at a point having good visibility along the highways in both directions. Some growth on the north side of the intersection should be cut back to permit an unobstructed view in both directions from a point twenty feet back from the edge of the travel lane of the highway. A telephone pole immediately south of the intersection poses some problems looking southward and should be relocated.

The only other existing road penetrating the site is Lake View Drive, which presently serves about forty homes and cottages along the east side of the lake. The road is unimproved and should not be considered as anything more than an emergency access to the site. A removable barricade should be placed on the road at the southern boundary with the campground. A condition of the special exception permit could be that the campground not be permitted to operate when the regular access is blocked, regardless of the reason for such blockage.

Improvement of the access road will result in considerable runoff in the direction of Pickerel Pond, since the slope is entirely in that direction. Care should be taken to assure that this does not cause erosion on or adjacent to the site.

The use of land in the vicinity of the property is of very low intensity. Therefore, the adverse impact of this new use on existing land uses should be slight. The most noticeable impact will be on the lake, which will receive considerably more use than at present. The proximity to the public boat launch will probably generate more boating. Unless motor size and boat speeds are controlled by town ordinance, this could prove a real problem to fishermen and swimmers.

Assuming that recreation campgrounds are an appropriate land use in Colchester, then the proposed site is particularly well suited. Pickerel Pond is large and can certainly accommodate the added use, especially in view of the limited season usually associated with camping. The access is good, and visitors need not traverse local residential streets to get to the campground. The area proposed for the use is decidedly rural, but the daily shopping needs of visitors can be met conveniently in the small shopping center located less than a mile north of the property at the intersection of Routes 149 and 16.

RECREATION POTENTIAL

The 28-acre site proposed for a privately owned and operated family campground located on Pickerel Pond appears suitable for this activity if the owner is willing to make those expenditures necessary to overcome the soil limitations. Soils analysis shows that only 20% of the tract has moderate limitations imposed on campsite construction. The remaining 80% has severe limitations due to soil conditions.

The proposed site development plan may require modification to avoid major site alteration due to wet ground conditions. Rerouting the camp roads to avoid the wettest areas will effect a modest reduction in the total number of sites from the 114 proposed (assuming size of individual sites is not reduced). Development costs could be substantially reduced by utilizing only those portions of the tract which lend themselves to the activities sought, without major alteration or modification of the resource base of the site.

To maintain the same size individual campsite, with approximately the same separation, the total number of sites may have to be reduced to approximately 90. Soils limitations will help determine layout of the road network and suitable locations for campsites. Consideration should be given to use of only one side of the road for campsites where a narrow usable land corridor exists.

A proposal made by the Soil Conservation Service, to construct a pond in the southeastern portion of the tract should be considered. This is probably the wettest part of the tract and for this reason is severely limited for the location of campsites. This feature (wetness) could become an asset by installing a small pond to provide fishing opportunities, wildlife habitat, and a scenic setting for walking paths, thereby enhancing the recreational possibilities.

With the exception of the access road corridor from Route 149, gravel surface interior roads would help minimize excessive runoff generated by a paved surface. Properly constructed and well maintained gravel roads are also more in keeping with a rustic setting; and will help to reduce the potential for erosion in the proposed beach area and on the slopes immediately above it.

A centrally located recreation hall could have an outside play area with activities for children and adults such as: swings, see-saws, horseshoe toss and possibly a tennis court. An adult recreation area should probably be segregated from a children's area to minimize the danger posed by tossed horseshoes and other conflicting uses. Crowding of recreational activities should be avoided. Walking paths could supplement the vehicle roads to provide access to the various facilities and help meet the increasing demand for jogging areas.

Installation of a beach for the campground is proposed on Pickerel Pond. A beach 150' wide and 50' deep would accommodate 50 bathers based on the recommended minimum standard of 150 square feet/bather. The beach size may be adjusted accordingly, as determined by need, but within the natural limitations imposed by the site. There is a fairly steep slope immediately behind or east of the proposed beach location. Camper access to the beach would be via this slope. A path providing this access should be designed and constructed to reduce erosion potential. Indiscriminate use of steep slopes by even a moderate number of people will enhance erosion potential. Use of non-designated areas deemed fragile may be discouraged by a screen planting of shrubs and trees. Thickly planted juniper, cedar,

and mahonia, with its prickly foliage, can be a deterrent and help direct people to the proper area. Such a planting can enhance the beach setting by masking structures and camping rigs from view at the beach.

In designing a beach for swimming, plans for rescues and emergency evacuation should be made and coordinated beforehand so that any potential questions regarding emergency procedures are answered before the time of actual need. The American Red Cross can offer assistance in this area.

The back (east) edge of the beach will be at or close to the base of the steeper slope and should be protected from stormwater runoff by a berm of some sort. A low linear grassy mound or a partially buried log barrier lining the beach edge will help divert the water around the beach thereby reducing beach sand loss. The pond bottom in the beach area should be cleared of potentially hazardous objects.

A play area is also proposed for the beach area. It should be located on relatively level ground, and for this reason, may have to be situated on the north or south end of the beach area rather than behind it. A natural barrier of shrubs could be used to clearly mark the dividing line between these two areas. Dense shrubbery may reduce nuisance occurrences, such as volleyballs going into the beach area.

Construction of roads, campsites, toilet buildings and other supportive structures should be done with an eye toward retaining as much of the tract's natural beauty as is possible. Minor plan alterations can help save individual trees or flowering shrubs and help make for an improved overall appearance of the campground. Trees which are cut can be fully utilized for firewood, barriers, wood chips, etc. Wood chips should be used in wooded areas where heavy foot traffic is expected. This will reduce soil compaction and resultant tree kill. The application of wood chips should be an ongoing (year to year) program to help prevent site degradation. Narrow foot paths built up with gravel need not be overlain with wood chips. Paths routed through wet area can be built of corduroy (small log segments) instead of/or in combination with a gravel base.

To help ensure survival of the existing trees, debarking and root scoring should be avoided, when possible, during the construction process. Existing grades should not be appreciably raised by application of fill material over the roots of trees to be saved. This also causes lessened vigor and often death of these trees.

Individual campsites can be comprised of angled spurs which are easier to back into and pull out of. Determination of campsite layout will necessarily be made after the selection of road locations. The campground entrance on Route 149, as well as the camp spurs, should be properly designed to enable the larger camp trailers to turn and park without excessive maneuvering.

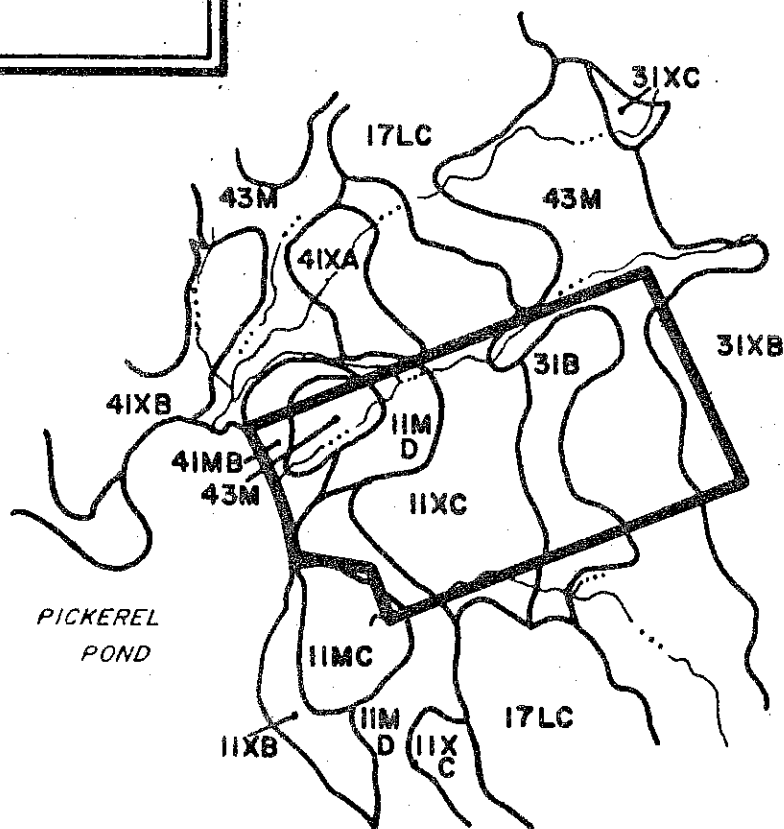
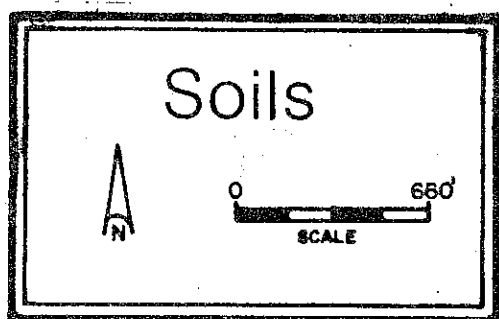
Erection of two poles for clothesline use is recommended on at least those sites selected for tent use. Lack of clothesline poles will result in campers tying lines to live trees to dry out their bedding, etc. and can result in tree injury through the accumulated effect of chafing.

Cutting of trees on the steeper slopes found near the pond should be kept to a minimum. As previously mentioned, the undergrowth of shrubs can help direct

foot traffic and reduce soil erosion while providing a visual screen. Cutting of understory shrubs and trees to create a park like setting should have no harmful impact on the level portions of the tract. Retaining some shrubs and trees selected for their flowers (e.g. - mountain laurel) or food value would, however, aid aesthetic and wildlife considerations.

Appendix





SOIL LEGEND

<u>Symbol</u>	<u>Soil Name</u>	<u>Slope</u>
43M	Ridgebury, Leicester and Whitman, extremely stony fine sandy loam	
31XB	Woodbridge very stony fine sandy loam	0-8%
31B	Woodbridge fine sandy loam	3-8%
11XC	Canton and Charlton very stony fine sandy loam	8-15%
11MD	Canton and Charlton extremely fine sandy loam	15-35%
11MC	Canton and Charlton extremely stony fine sandy loam	3-15%
41MB	Sutton extremely stony fine sandy loam	0-8%

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	Camp Sites	Streets & Parking	Land-Scaping
Canton-Charlton	11XC	8	29	Large stones, slope	2	3	2	2
Canton-Charlton	11MC	1	4	Large stones	3	3	3	3
Canton-Charlton	11MD	4	14	Slope, large stones	3	3	3	3
**Ridgebury, Leicester and Whitman	43M	8	29	Stones, percs slowly	3	3	3	3
Sutton	41MB	1	4	Stones, wetness	3	3	2	2
Woodbridge	31XB	2	6	Percs slowly	3	2	3	2
Woodbridge	31B	4	14	Percs slowly	3	2	3	1
		28	100%					

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

** Regulated wetland soil under PA 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.

THE HISTORY OF THE CITY OF BOSTON

FROM THE FIRST SETTLEMENT
TO THE PRESENT TIME
BY
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