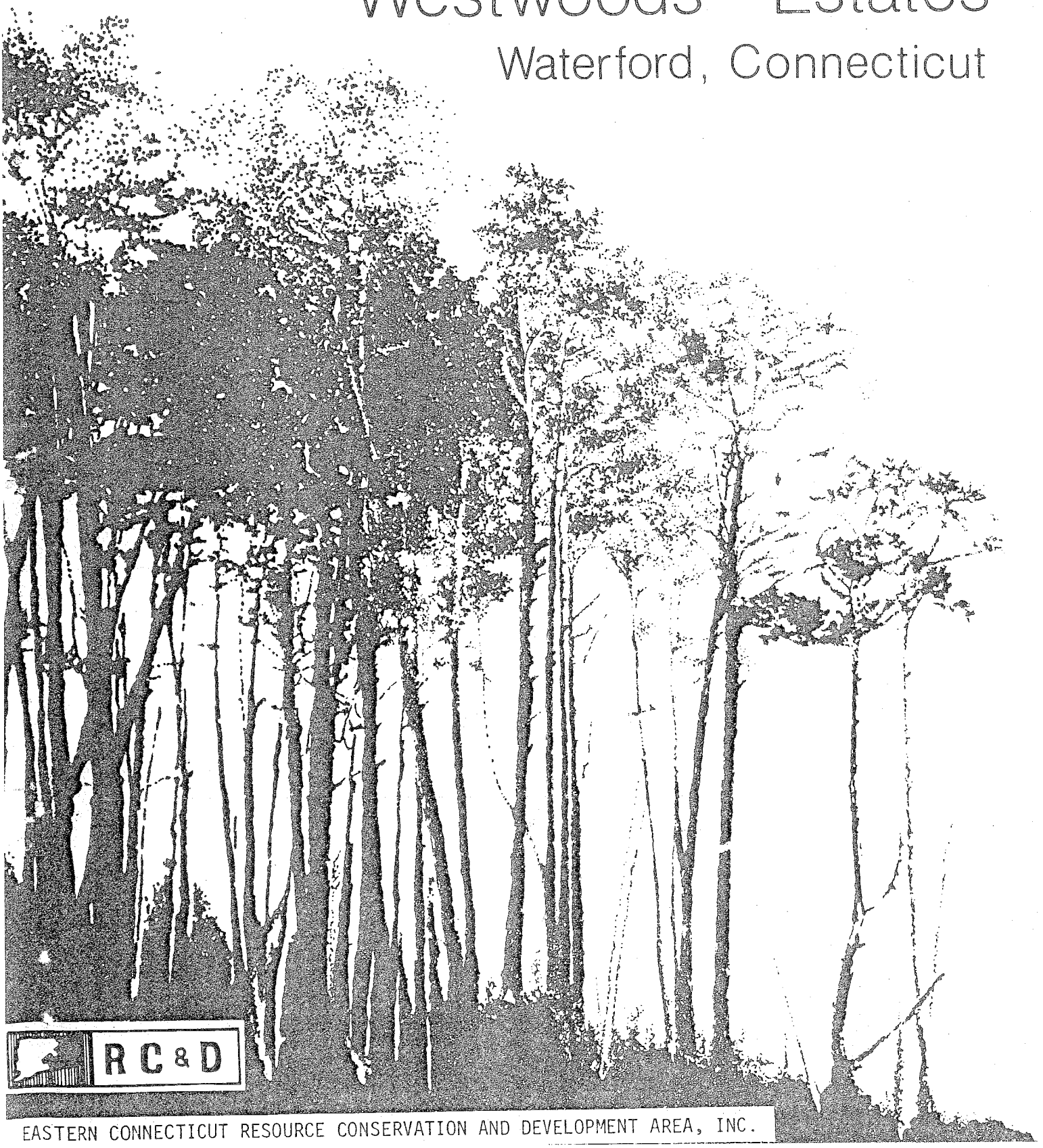
Environmental Review Team Report

Westwoods Estates

Waterford, Connecticut

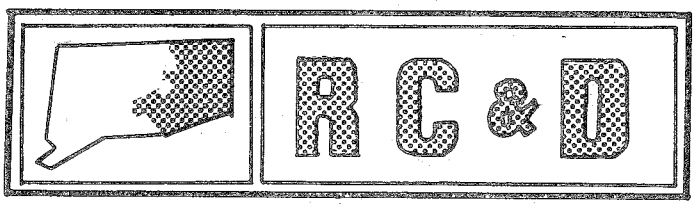


R C & D

EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

Environmental Review Team Report on Westwoods Estates Waterford, Connecticut

March 1981



eastern connecticut resource conservation & development area

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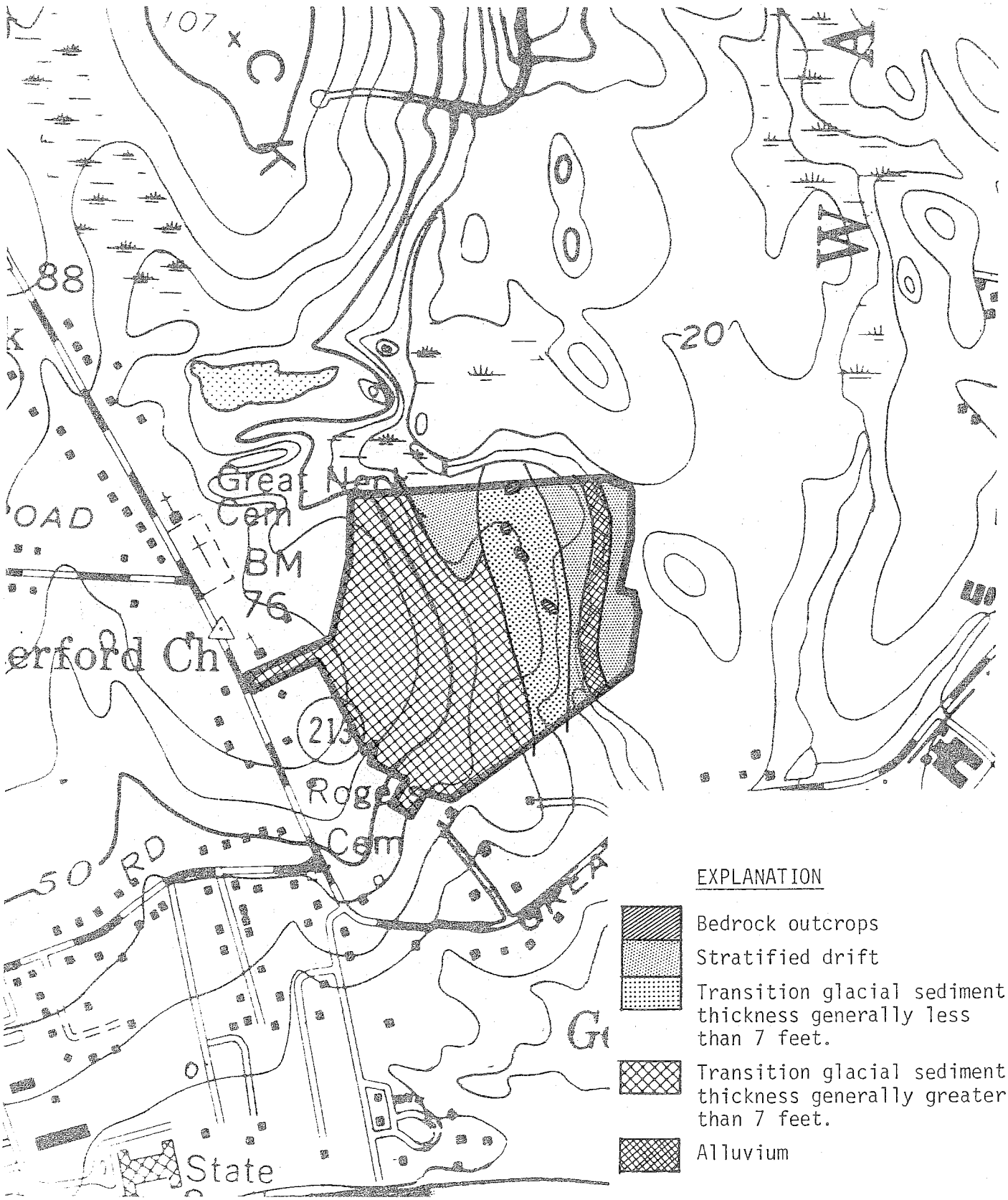
Surficial Geology



means of allowing eroded materials to settle out before leaving the site is recommended, to prevent the possibility of siltation in the wetlands along the "main" stream, in the pond south of Great Neck Road or in Goshen Cove. Direct discharges planned to the stream from the southeastern storm drainage outlet would appear to produce a constant source of sediment. Although catch basins are planned for this area, the majority of the Team members for this review do not feel that they provide the stream adequate protection from sediment and other contaminants due to the rapid flow of stormwater through these facilities and questionable maintenance practices.

ENVIRONMENTAL ASSESSMENT

GEOLOGY

The Senkow property is located in an area that straddles the adjoining boundaries of the New London and Niantic topographic quadrangles. The U.S. Geological Survey has published bedrock and surficial geologic maps of both quadrangles. Bedrock cropping out on and underlying the site is a gneiss composed of variable proportions of the minerals plagioclase, quartz, biotite, and hornblende, with other minor minerals. The color of the rock ranges from a lightly speckled white in the high-plagioclase and high-quartz-content rocks to a dark gray to black in the high-biotite and high-hornblende-content rocks. The term "gneiss" is textural; it refers to the tendency of elongate, flaky, or platy minerals to form thin bands that alternate with layers of more rounded mineral grains. The rocks consequently tend to have a streaky or banded appearance. Exposures of the bedrock were observed only in the northeastern quarter of the site. The exposures were small and relatively flat.

The surficial geology of the property consists largely of glacial sediments. Along the stream at the eastern boundary of the site, the sediments are capped by a thin layer of sand and silt that accumulated during the periodic flood stages of the stream. The glacial sediments themselves, at least in this area of the tract, are stream deposits of a sort: glacial streams were produced by the melting of ice masses during a recessional phase of ice movement. The rock materials that make up the glacial deposit were derived from the soils and bedrock surfaces over which the ice flowed as it expanded southward into and through Connecticut. Variations in the flow rates of the meltwater streams allowed rock particles to be sorted by size; that is, particles of similar size tended to be deposited together in any one depositional layer. The buildup of layers under this process has given the sediments a noticeable stratification; hence, meltwater deposits are generally termed "stratified drift."

Over most of Connecticut, glacier ice deposited rock debris directly, without subsequent transport by meltwater. The resulting sediment, called till, is nonsorted and nonstratified in most places. However, in some areas, till was partially reworked by meltwater, giving it a coarse texture by carrying away fine particles, and in some cases producing a rudimentary stratification. The surficial materials in the western half of the site may be either a reworked till or a relatively poorly sorted stratified drift. An excavation along the access road in the area of proposed lots 4-6 showed a sandy, gravelly subsoil with a contorted but distinct stratification. The depth of the exposed stratified section was at least five feet. A similar section was observed along the

drainage channel flowing north from the loop road. On the other hand, material described in records of test holes dug at various points on the site included "clay," suggesting that water-working in the sediments was not thorough. For this reason, the surficial geology of the western part of the site is probably best described as "transition glacial sediment." The material may be expected to be generally coarse-grained, but variable in the upper 3 to 8 feet, and probably siltier and more compact below. Hardpan layers probably will not be as widespread a limiting factor as the soils map suggests, but the potential presence of such layers in some areas should not be discounted.

HYDROLOGY

Much of the surface drainage from the site will be collected by a storm drainage system in the loop road and will be piped to two principal outlets. One outlet will be located along the road in the north-central portion of the property. Discharges from that point will enter an artificial channel running between lots 7 and 8, and will be thereby directed into a stream that winds around the northern and eastern boundaries of the site. The second outlet will be from a pipe running between lots 13 and 14. Discharges from that point would apparently be made directly into the stream. The stream itself (referred to as "Main Brook" on the site plans) flows south, passing under Great Neck Road into a rectangular man-made pond, and thence into Goshen Cove. The distance from the site to the cove along the streamcourse is only about 1150 feet.

Development of the site as planned will cause increased in runoff. The amounts of these increases may be estimated by a method outlined in Technical Release No. 55 of the Soil Conservation Service. Although the property had been partially developed at the time of the Team's field review, the estimates given below reflect the differences in runoff between the site as completely developed and as completely undeveloped (wooded). It should also be noted that the rainfall estimates for the three design storms evaluated were taken from state data compiled by the U.S. Geological Survey, Water Resources Division, rather than from the less accurate national rainfall charts included in Technical Release No. 55. All runoff estimates are given in acre-feet and refer to estimated total runoff volumes from the property.

	10-year storm	25-year storm	50-year storm
Pre-development runoff	6.87 acre-feet	11.77 acre-feet	15.08 acre-feet
Post-development runoff	10.24 acre-feet	14.56 acre-feet	18.10 acre-feet
Percentage increase	49%	24%	20%

The runoff increases will cause peak flows in the local streams to rise unless engineering methods are used to prevent this. The main steam has an overall watershed of approximately 500 acres; the development would comprise only about 26 acres of this (although the total area of the site is larger). Because of the small percentage of watershed land involved, peak flow increased in the main stream may be expected to be small (less than 5 percent). Still, the development of the Senkow property should be viewed in the context of a series of potential developments within the watershed. The cumulative impact

of such a series on the main stream may be dramtic. Of course, any peak flow increase that is solely attributable to the development of the Senkow subdivision will affect only the portion of the stream valley south of the site; in this sense, the development poses a smaller potential problem than would a similar project undertaken further upstream - less of the stream's floodplain length is involved in the present plan.

Any runoff retention or flow mitigation that is accomplished under the proposed storm-drainage design will be the result of storm sewer pipe and culvert sizing. In other words, stormwater will not be retained unless the flows are greater than the pipes and culverts can accommodate. Approximately one-third of the site (lots 9-17) will continue to drain naturally by overland flow after development. Lots 1-3 and part of the new road will drain to the piped outlet in the southeastern section of the site. The remainder of the parcel will drain to the artificial channel in the north-central section. Peak flows in the channel at the point where it joins the main stream were estimated for pre-development and post-development conditions. These estimates are based on the assumption that the storm sewers and the culvert under the loop road would be large enough to pass the flows freely. The engineer for the project informed the Team that the storm drainage system was based on 25-year peak flow estimates under the Rational Method, with the exception that the culvert was designed for a 50-year peak flow. It was not clear, however, whether this referred to the estimated pre-development flows or the estimated post-development flows. If the latter, then the storm drainage system will provide no mitigation of runoff increases for storms of 50-year magnitude or less. The Team used the SCS curve-number method for its estimates. All flows are given in cubic feet per second.

	10-year storm	25-year storm	50-year storm
Peak flows before development	38 cfs	58 cfs	74 cfs
Peak flows after development	104 cfs	146 cfs	188 cfs
Percentage increase in peak flows	174%	152%	154%

The estimates given above may differ from those that would be obtained with a different method of calculation (such as the Rational Method). The Team's use of the SCS curve-number approach is not meant to imply a conclusion as to the relative merits of other methods.

It can be seen from the estimated percentage increases in peak flows that the effect of development may be substantial. The results may be two-fold: increased erosion and sedimentation, and increased area of potential flooding. Erosion and sedimentation would result from the combination of augmented flows, vegetation removal, and land regrading. Some means of allowing eroded materials to resettle before leaving the site is necessary to prevent the possibility of siltation in the wetlands along the main stream, in the rectangular pond south of Great Neck Road, or in Goshen Cove. At present, several rows of hay bales have been placed across the artificial channel. This will, of course, be helpful for the portion of the site that drains to the channel, but other measures will be needed for the remainder of the property. The direct discharges to the stream from the southeastern storm drainage outlet may be a particularly problematic source of sediment.

An increase in the area affected by flooding during a storm of given magnitude may be expected following development unless runoff-retention measures are utilized. In essence, flooding results from the inability of a stream to pass heavy flows through its channel: excess waters are stored temporarily in the floodplains. Increased flows from developed areas require increases in the storage space used. With no controls on the site, the storage would occur in the floodplain; the additional area flooded would be determined in part by the level of Goshen Cove at the time and the ability of the culvert under Great Neck Road to pass the flows from the main stream. If a retention basin were constructed on the site, flows could be metered at the outlet to prevent them from exceeding a predetermined rate. The most suitable place for such a basin would be between lots 7 and 8. If no basin is constructed, flow rates from the site will be controlled only by the sizes of the storm sewer pipes and the culvert under the loop road. The culvert itself would be an effective control only for runoff from the central lots (18-23), and excess water would be ponded in the swale south of the culvert.

Since there appear to be no sedimentation controls at the southeastern storm drainage outlet, and since any runoff controls used would probably be most effective along the northern outlet, the developer may wish to consider outletting the drainage from the southern portion of the loop road into the swale at lot 23, rather than directly into the brook. The town should also recognize that runoff increases from lots 9-17 will not be controlled by the storm drainage system as presently designed; therefore, in order to assure that there be a zero increase in overall peak flows, the controls at the northern outlet will have to be designed to release a flow that is actually smaller than the flow at that point would be if the site remained wooded.

SOILS

A detailed soils map of this site and detailed soils descriptions are included in the Appendix to this report, accompanied by a chart which indicates soil limitations for various urban uses. As the soil map is an enlargement from the original 1,320'/inch scale to 660'/inch, the soil boundary lines should not be viewed as absolute boundaries, but as guidelines to the distribution of soil types on the site. The soil limitation chart indicates the probable limitations of each of the soils for on-site sewage disposal, buildings with basements, streets and parking, and landscaping. However, limitations, even though severe, do not preclude the use of the land for development. If economics permit large expenditures for land development and the intended objective is consistent with the objectives of local and regional development, many soils and sites with difficut 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 moderately well drained rounded or elongated hills of uplands are occupied by Woodbridge very stony fine sandy loam. This soil is represented by the mapping unit symbol 31XB. The symbol "X" represents a very stony surface condition. The symbol "B" denotes 0 to 8 percent slopes. Woodbridge soils are formed in compact glacial till. Permeability is moderate in the

surface layer and subsoil, slow or very slow in the substratum (fragipan). A seasonal high water table exists at 18 to 24 inches. Runoff is slow to rapid.

The nearly level, poorly to very poorly drained soils on uplands are occupied by Ridgebury, Leicester and Whitman extremely stony fine sandy loams. Ridgebury soils formed on compact glacial till. Permeability is moderate to moderately rapid in the surface layer and subsoil, slow and very slow in the substratum (fragipan). A high water table exists at or near the surface 7 to 9 months of the year. Runoff is slow to medium.

Leicester soils formed in friable glacial till. Permeability is moderately rapid. A high water table exists at or near the surface 7 to 9 months of the year. Runoff is slow.

Whitman soils formed in compact glacial till. Permeability is moderate to moderately rapid in the surface layer and subsoil, slow or very slow in the substratum (fragipan). A high water table exists at or near the surface 9 to 10 months of the year. Whitman soils have a high runoff potential.

The nearly level poorly drained stream terraces and outwash plains are occupied by Walpole sandy loam. Walpole soils are denoted by the mapping unit symbol 466. This soil formed in glacial outwash. Permeability is moderately rapid in the surface layer and subsoil, rapid and very rapid in the substratum. A high water table exists at or near the surface 7 to 9 months of the year. Runoff is slow.

The following soils qualify as Prime Farmland soils: (63A) Haven silt loam, 0-3 percent slopes; (35B) Paxton fine sandy loam, 3-8 percent slopes.

Prime farmland, as defined by the U.S. Department of Agriculture, is the land that is best suited to producing food, feed, forage, fiber and oilseed crops. It has the soil quality, growing season, and moisture supply needed to economically produce a sustained high yield of crops when it is treated and managed using acceptable farming methods. Prime farmland produces the highest yields with minimal inputs of energy and economic resources, and farming it results in the least damage to the environment.

The following soils are designated as wetlands and are regulated under Public Act 155: (43M) Ridgebury, Leicester and Whitman, extremely stony fine sandy loams; (466) Walpole sandy loam.

The soils mapped as Charlton-Hollis fine sandy loams (17LC) occupy approximately 23 percent of the property. These soils have limitations due to slope and shallow to bedrock conditions. The Charlton soils are deep soils and have moderate limitations for most building site development uses because of slope and surface stoniness. Hollis soils are 20" or less to bedrock and are rated severe for most building site development uses because of slope and a shallow depth to bedrock.

The Charlton soils, in the same mapping unit, have moderate limitations for septic tank absorption fields. Limitations are due to slope and large surface stones. The Hollis soils have severe limitations for septic tank absorption fields due to the shallow depth to bedrock. Engineering practices to overcome these soil limitations include adding fill, controlling housing density, enlarging leaching field areas, and avoiding construction during wet periods. Land shaping and stone removal will be necessary. Public water is available. Therefore, effluent pollution to onsite wells will not be a concern.

The soils mapped as Paxton very stony fine sandy loam (35XC) occupy approximately 30 percent of the property. Paxton soils have moderate limitations for most building site development uses. Limitations are due to slope and large surface stones.

For septic tank absorption fields, Paxton soils have severe limitations due to large surface stones. Permeability is moderate in the surface layer and subsoil, but is slow in the substratum (fragipan). Slow permeability in the fragipan will also cause severe limitations for installation and proper functioning of septic systems. Management practices to overcome these limitations include avoiding construction during wet seasons, installing interceptor drains over the hardpan and enlarging septic leaching fields.

The soil mapped as Woodbridge very stony fine sandy loams (31XC) occupy approximately 21 percent of the property. Woodbridge soils have severe limitations for most building site development uses. Limitations are due to a high seasonal water table, frost action, slope and large surface stones.

For septic tank absorption fields, Woodbridge soils have severe limitations due to wetness and a slow or very slow permeability in the fragipan. Management practices to overcome these limitations include installing interceptor drains over hardpan, adding fill, enlarging the septic leaching field and installing regional drainage to lower the water table.

Regulated wetland soils on the property are mapped 43M, Ridgebury, Leicester and Whitman extremely stony fine sandy loams and 466 Walpole sandy loam. These soils occupy 16 percent of the property. Soils mapped 43M have limitations due to stoniness, wetness, and slow permeability. Soils mapped 466 have limitations due to wetness.

These soils should not be used for building site development or septic tank absorption fields.

A sediment and erosion control plan has been developed by the developer. Guidelines from the "Erosion and Sedimentation Control Handbook, CT, 1976," have been used.

A drainage ditch goes through the approximate center of the property, flowing in a northerly direction to the "main" brook. This is referred to as the "north drainage system." The ditch is located in wetland soils (43M). Sediment and erosion control practices have been installed along the ditch to minimize the possibility of sediment reaching the "main" brook. A series of staked haybales and a sediment pool has been installed along the ditch.

Water from the ditch will flow under the road into a 30 inch pipe which will outlet into a stabilized channel before entering the "main" brook.

The South drainage system will consist of catch basins and a buried 21 inch corrugated metal pipe, which will outlet to the "main" brook.

VEGETATION

The $36^{\pm}$ acre Senkow Property may be devided into three vegetation types. They include mixed hardwoods, $22^{\pm}$ acres; Pine Plantation, $5^{\pm}$ acres and Hardwood swamp/streambelt, $4^{\pm}$ acres. Roads and construction storage buildings total approximately 5 acres. (See Vegetation type map and Vegetation type descriptions.)

Many of the trees present within this property are of poor quality. A few large healthy trees are present; these trees should be incorporated into site design and retained. Damaged trees, which will become a hazard, should be removed. Red pine scale is present within the pine plantation. Infested trees should be removed. The remaining red pine should be removed before the scale infects them. This will reduce the hazard of falling trees, years after the construction has been completed.

Vegetation Type Descriptions

Type A. (Mixed Hardwoods) This $22^{\pm}$ acre fully stocked stand is made up of pole and occasional sawtimber-size black birch, red maple, red oak, black oak, white oak, yellow birch, black gum, pignut hickory and scattered American beech. The majority of the trees in this stand are in very poor condition. Many have damaged tops, large seams and poor form. The trees have been removed from the portions of this tract where roads have been proposed. Trees are becoming crowded where clearing has not taken place. The understory in this area is dominated by blue beech, maple-leaf viburnum, patches of sweet pepperbush and occasional alternate-leaf dogwood. The vine species present in this stand include poison ivy, green brier and japanese honeysuckle. Grasses, clubmoss, white pine seedlings, wild strawberry, evergreen wood fern, bracken fern, Christmas fern and spinulose wood fern form the ground cover in this area.

Type B. (Plantation) Pole to sawtimber size eastern white pine and red pine are present in this $5^{\pm}$ acre fully-stocked stand. It should be noted that the effect of an insect which infests and causes mortality in red pine (the red pine scale) was observed during the field investigation. Within a few years this insect will probably cause mortality in the rest of the red pine within this stand. Maple-leaf viburnum, black cherry seedlings and black birch seedlings form the sparse understory in this stand. Ground cover is dominated by Canada mayflower, poison ivy, grasses and goldenrod.

Type C. (Hardwood Swamp/Streambelt) Poor quality pole with occasional sawtimber size red maple in clumps and scattered black gum and yellow birch are present in the stream belt areas which total $4^{\pm}$ acres. The majority of this area is understocked. An extremely dense understory which includes spice bush, sweet pepperbush, highbush blueberry and greenbrier is present.

The majority of the trees present within this tract are of poor quality. This results in their low aesthetic value. The few trees which are of reasonable quality should be selected and temporarily but clearly marked for retention. These trees, because of their scarcity, have high aesthetic value.

Vegetation

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scale

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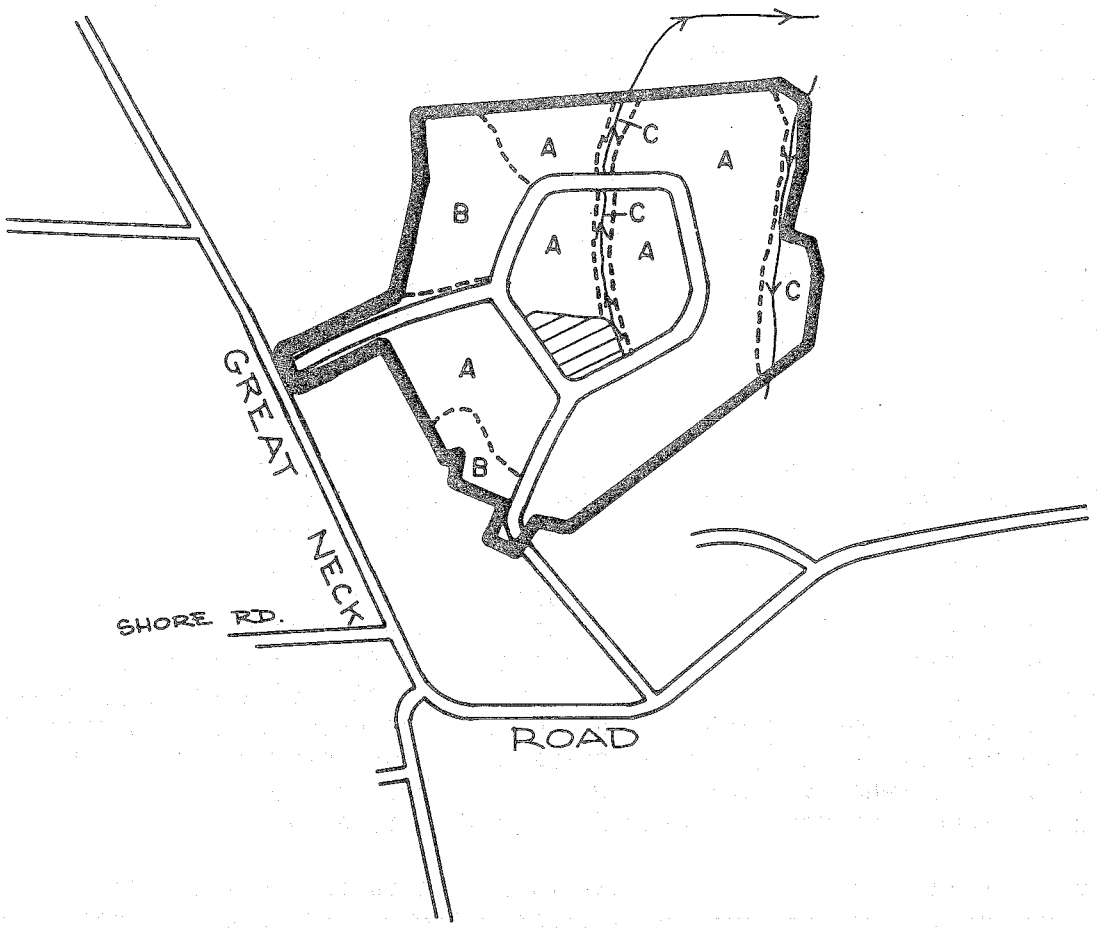


LEGEND

- Road
- Property Boundary
- Vegetation Type Boundary
- Stream
- Construction Storage 1±acre

VEGETATION TYPE DESCRIPTIONS*

TYPE A. Mixed hardwoods, 22±acres. Fully stocked, pole with occasional sawtimber-size.

TYPE B. Pine plantation, 5±acres. Fully stocked, pole to small sawtimber.

TYPE C. Hardwood swamp/stream belt, 4±acres, under stocked, pole with occasional sawtimber-size.

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

It should be noted that trees are very sensitive to the condition of the soil within the entire area under their crowns. Disturbances such as excavating and grading which disrupt the balance between soil aeration, soil moisture level and soil composition may cause a decline in tree health and vigor, potentially resulting in tree mortality within three to five years. Mechanical injury to trees may cause the same results. Dead trees may become hazardous and expensive to remove if near roadways, buildings or utility lines. The trees which will potentially present a hazard should be located and removed at or before the time of house construction. These trees could be utilized as fuelwood.

Windthrow is a potential hazard in the hardwood swamp/ stream belt areas (vegetation Type C). The trees in these areas are shallow rooted and unable to become securely anchored in the saturated soils. Clearing operations in these areas may accelerate the loss of trees to windthrow.

Some of the red pine in the Pine Plantation (vegetation Type B) are infested with red pine scale. This insect causes unsightly browning of the needles and eventually mortality of the infested trees. No safe effective control is known at this time. Trees which are infested should be removed to help reduce scale population levels and the hazard of dead trees falling. It is probable that this insect will cause mortality in the remaining red pines. It would be advisable to remove these red pine prior to house construction. At first, every other red pine should be removed. In several years, once the rest of the trees have become more stable, the remaining half should be removed. This thinning will benefit the remaining eastern white pine by reducing competition for space, sunlight, nutrients and water.

If further information is needed on the red pine scale or on selective thinning, the town or developer should contact a public service forester or a private forester.

WATER SUPPLY

It is understood a water line in the general area would be extended in order to provide the subdivision with public water from the New London Public Water supply. Therefore, with the availability of public water, there would be assurance of no potential water supply contamination problems from the use of on-site sewage disposal systems.

WASTE DISPOSAL

Although the Town of Waterford has recently undertaken extensive sewering of many locations, the general area in question is not presently served nor is future sewering anticipated. Therefore, the use of private on-site sewage disposal systems would be necessary relative to the development of building sites.

Visual observations combined with soil service mapping data indicates that a considerable portion of the property has limitations which are not particularly favorable for subsurface sewage disposal. These conditions consist of a relatively high ground water level or seasonally perched water table due to underlying tight and slow vertical draining soils. In addition, there is an area where exposed boulders and/or shallow underlying bedrock are definite factors.

The most favorable and suitable area, having some possible slope complications, is present at the upper west side. However, conditions do not appear to be restrictive.

In accordance with Public Health Code requirements, it is essential that bedrock and/or ground water not interfere with the operation of the leaching portions of subsurface sewage disposal systems. This implies that bedrock needs to be at least 4 feet and maximum ground water level 1.5 feet below the bottom area of leaching systems. Locating systems in suitable soils which are deep enough to provide treatment of the effluent and a sufficient horizontal distance away from the area of ground water discharge, such as a stream, will in most cases prevent contamination problems. These same factors, along with naturally occurring dilution by underlying ground water, should also prevent chemical components from causing any significant degradation problems. Of course, an additional factor on the total impact would be the density of houses and people on the site. However, with the proposed lot sizes this should not be a major factor.

The consulting engineer for this project has conducted percolation tests on various lots and a limited number of deep test pits. Testing was performed during the end of July, which is normally a very dry period. Therefore, there could be some variations in the seepage rates, plus a question as to the height of the ground water table. Soil mottling, in most cases, can indicate a seasonal high ground water level. However, in some circumstances or with certain soils lacking mottling, there may be high seasonal ground water. In addition, because of the bedrock that is quite apparent in some portions of the property, further testing would be needed to locate suitable areas of sufficient size to accommodate the sewage systems. In general, it would appear that a number of the lots would require site modifications in order to be acceptable. In such cases, detailed engineering plans would need to be prepared for the on-site systems. All pertinent site factors and testing information should be included.

PLANNING CONCERNS

On a land use basis, a large lot subdivision would be compatible with the surrounding low density residential uses. The area is zoned for one-acre single family homes and is recommended for residential development in the regional development plan. A nursery is located east of the site and a church to the west along Route 213 (Great Neck Road). Undeveloped forested areas are located north and south of the site.

If some of the lots such as 12, 13, and 14 cannot support on-site septic systems because of wetness and high water table, then perhaps a cluster approach could be used in design or some type of community sewerage system could be employed. A Summary of Innovative and Alternative Systems by the Connecticut 208 program lists several kinds of community sewerage systems. Another approach would be to make any unbuildable lots subdivision open space. No open space is shown on the plan because the total number of lots is less than twenty-five.

Access to the proposed subdivision is via West Neck Road which connects with Route 213 (Great Neck Road) south of the site. West Neck Road is approximately 20 feet wide. A horizontal curve at this point in Route 213 causes a poor sight line. The Waterford Police Department should be consulted to determine the frequency of accidents at this location and to determine whether the 50 foot right-of-way from the site entering Route 213 by the Seventh Day Baptist Church would be a better, safer entrance. This would make the entrance road location between lots 3 and 4.

Additional traffic generated by this proposed subdivision could result in 10.6 trips per unit daily or 230 trips per day, where a trip is defined as an "entry to or exit from any location or site." This estimate is based on "pre-energy crisis" data supplied in "Trip Generation Study of Various Land Uses," CONNDOT 1974, so actual trip numbers per unit may be lower. West Neck Road may require widening to accommodate this increase in traffic flow.

Coastal Management

COASTAL MANAGEMENT CONCERNS

An application for a special permit to subdivide a 36-acre site has been submitted to the Planning and Zoning Commission by Theodore Senkow. The Coastal Management Act (C.G.S. 22a-90 to 22a-112) requires that a coastal site plan be prepared for certain specified activities (refer to section 22a-105b), including subdivisions, located fully or partially in the coastal boundary. Insofar as a portion of the activity (i.e., subdivision) lies partially within the boundary (see figure 4), then the entire 36-acre subdivision proposal is subject to the provisions of the act. In order to obtain a valid municipal approval for the subdivision under sections 22a-105 and 22a-106 of the Connecticut General Statutes, the applicant must submit a coastal site plan to the Waterford Planning and Zoning Commission and demonstrate that (1) the proposal is consistent with all applicable coastal policies, (2) adverse impacts on coastal resources and future water dependent uses are acceptable, and (3) all reasonable measures to mitigate adverse impacts have been incorporated into the project.

Coastal Resources

Technically, there are two main categories of resources on the site, coastal and non-coastal (upland). The latter includes all land outside the boundary. Coastal resources on the property include shorelands, coastal (flood) hazard area and fresh water wetlands/watercourses. Coastal resources adjacent to the site which may be affected directly or indirectly by the activity include shorelands, coastal hazard area, freshwater wetlands, tidal wetlands and coastal waters (estuarine embayments). A plan depicting the spatial location of coastal resources with respect to the activity must accompany the site plan.
The review outside the boundary should focus on potential but indirect impacts to coastal resources within the boundary stemming from sedimentation, runoff, contamination of tidal waters from subsurface runoff incidental to the proposed on-site sanitary facilities, etc.

Coastal Policies

Identification of all applicable coastal resource and use policies* ensues from the identification of the coastal resources and the types of uses or activities proposed. Insofar as this project is concerned, the applicable coastal policies are (as referred in CAM Planning Report #30): General Resource IA (A-C), Tidal Wetland IF (A,D), Freshwater Wetlands and Watercourses IG (A), Coastal (flood) Hazard Area IH (A), Shorelands IK (A) and General Development 2A (A). The applicant must demonstrate to the Planning and Zoning Commission that the proposed subdivision and all its associated activities are consistent with the policies. Assuming that the concerns further discussed, regarding potential adverse impacts are resolved, the project would appear to be consistent with these policies.

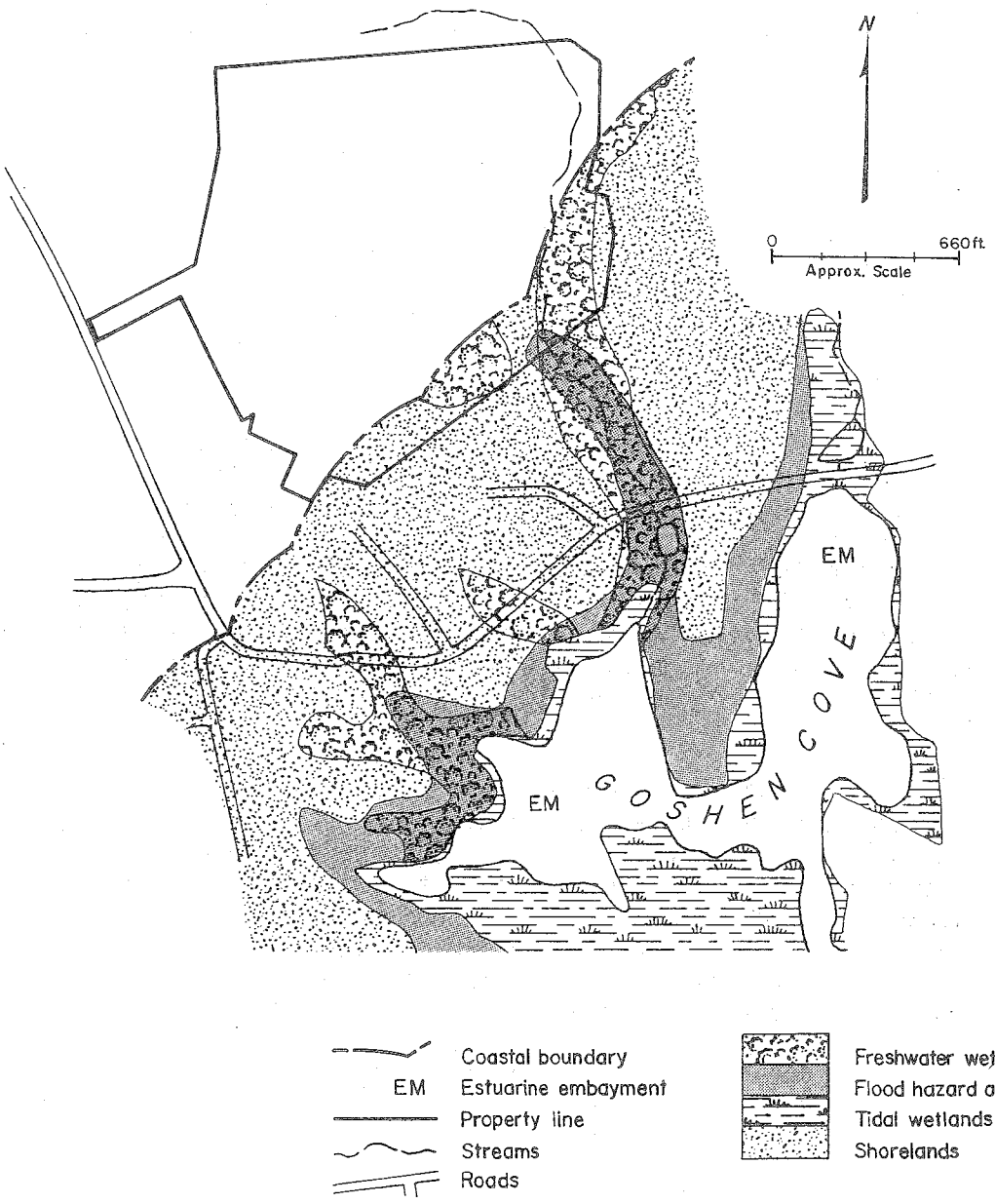
Adverse Impacts: Recommended Mitigation Measures

The central focus and concern of this review is to assure that the subdivision design, including density and pattern of parcels, and the stormwater

* Planning Report 30. Coastal Policies and Use Guidelines. 1979. Connecticut Department of Environmental Protection, Coastal Management Program.

COASTAL RESOURCES

FIGURE 4



design will not adversely impact coastal resources. All potential impacts must be demonstrated to be acceptable. For this project, potential adverse impacts on coastal resources as defined in Section 22a-92 of the General Statutes includes the following:

1. Degrading water quality through the significant introduction into either coastal waters or groundwater supplies of suspended solids, nutrients, toxics, heavy metals or pathogens, or through the significant alteration of temperature, ph, dissolved oxygen or salinity.

2. Degrading existing circulation patterns of coastal waters through the significant alteration of patterns of tidal exchange of flushing rates, freshwater input, or existing basin characteristics and channel contours.

3. Degrading natural or existing drainage patterns through the significant alteration of groundwater flow and recharge and volume of runoff.

4. Degrading tidal wetlands,...through the significant alteration of their natural characteristics or function.

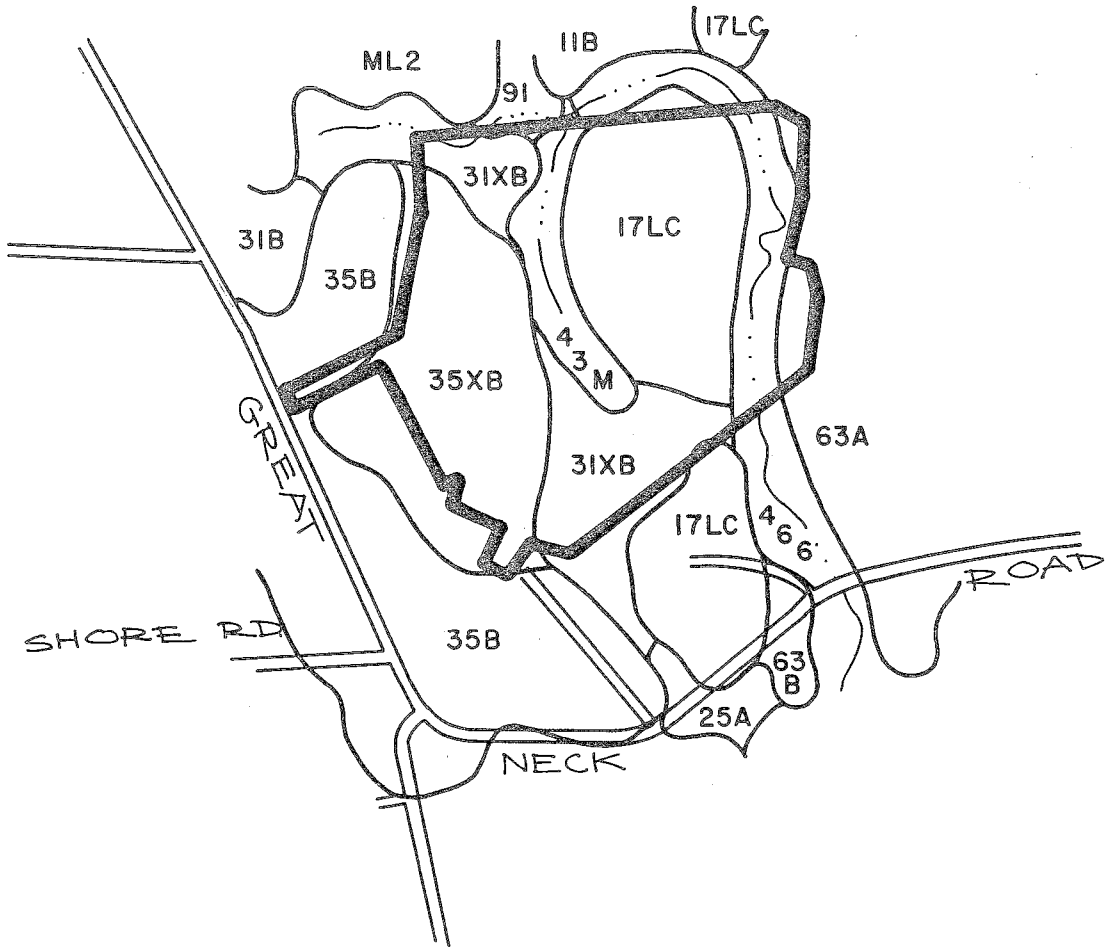
As property is not a waterfront site, and as the proposed subdivision will not affect use of the waterfront, potential adverse impact on future water dependent development opportunities is not an applicable consideration.

Activities that could potentially generate significant adverse impacts on coastal resources may result from (1) grading, filling, excavation, construction or placement of septic systems in close proximity to existing wetlands and stream borders without the proper erosion/sedimentation controls and (2) erosion, sedimentation and flooding from improper stormwater design and discharge. An appropriate buffer of natural vegetation and soil between the activities listed in 1 above and the stream/wetland will mitigate most of the potential adverse impacts. In especially sensitive areas, snow fences and two rows of offset haybales should be adequate to prevent sedimentation into the wetland and watercourse.

As outlined by the developer, stormwater will be discharged directly into the stream that borders the property at two specific sites. Furthermore, the runoff calculations based on a twenty-five year event indicate upwards to a 5-fold increase in runoff. This has the potential to create unwarranted stream erosion, sedimentation and downstream flooding. The applicant must demonstrate that such impacts are acceptable or propose an appropriate modification to the plan which will mitigate these impacts. The simplest solution to direct and uncontrolled release of stormwater is to provide an on-site detention basin for temporary storage of stormwater with delayed release. It is possible that the control swale and wetland could serve as an ideal detention basin with controlled release through an appropriate sized culvert under the proposed paved road.

Appendix

Soils


0
660'
SCALE
N
ML2
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11B
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6
GREAT
ROAD
SHORE RD
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B
25A
NECK

WESTWOODS ESTATES
WATERFORD, CONNECTICUT
PROPORTIONAL EXTENT OF SOILS AND THEIR LIMITATIONS FOR CERTAIN LAND USES

Soil Series	Natural Soil Group	Soil Symbol	Approx. Acres	Percent of Acres	Principal Limiting Factor	Urban Use Limitations*			
						On-Site Sewage	Buildings with Basements	Streets & Parking	Land-Scaping
Charlton-Hollis									
Charlton Part		17LC	10	23	Slope, stones,	2	2	2	2
Hollis Part					Depth to rock	3	3	3	3
Haven		63A	4	9	Frost action	1	1	2	1
Paxton		35XB	12	28	Percs slowly	3	2	2	2
Paxton		35B	1	3	Percs slowly	3	1	2	1
**Ridgebury, Leicester, Whitman		43M	3	7	Percs slowly	3	3	3	3
**Walpole		466	4	9	Wetness	3	3	3	3
Woodbridge		31XB	9	21	Percs slowly, Frost action	3	3	3	2

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

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.