MORNING THORPE SUBDIVISION
OXFORD, CONNECTICUT

KING'S MARK
RESOURCE CONSERVATION AND DEVELOPMENT AREA

KING'S MARK
ENVIRONMENTAL REVIEW TEAM REPORT

on the

MORNING THORPE SUBDIVISION
OXFORD, CONNECTICUT
DECEMBER 1976

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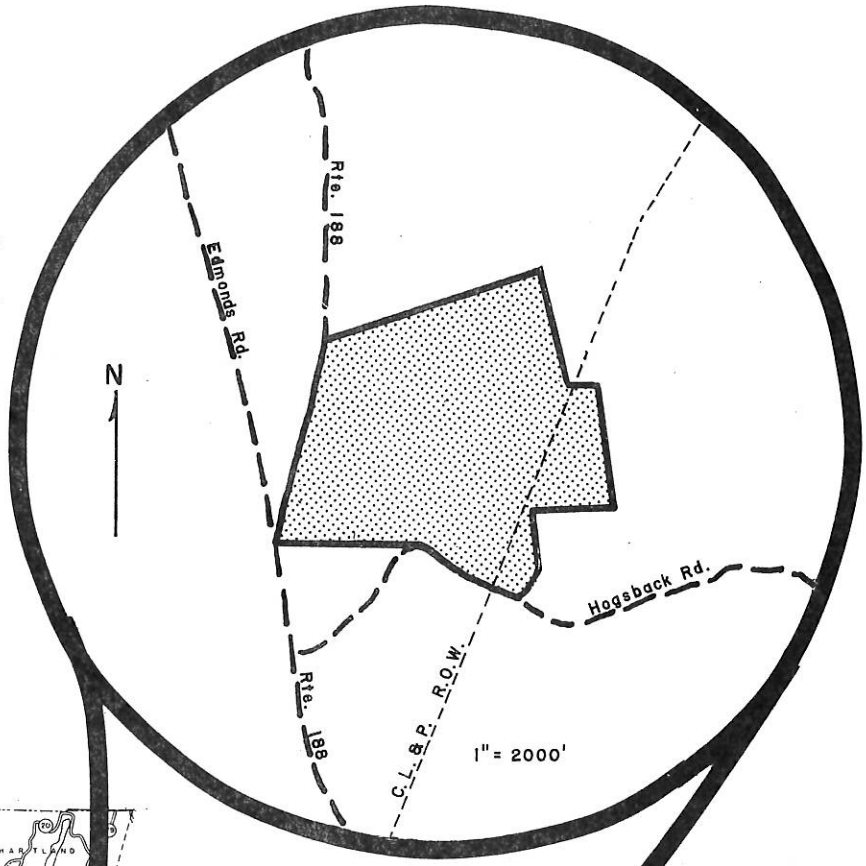
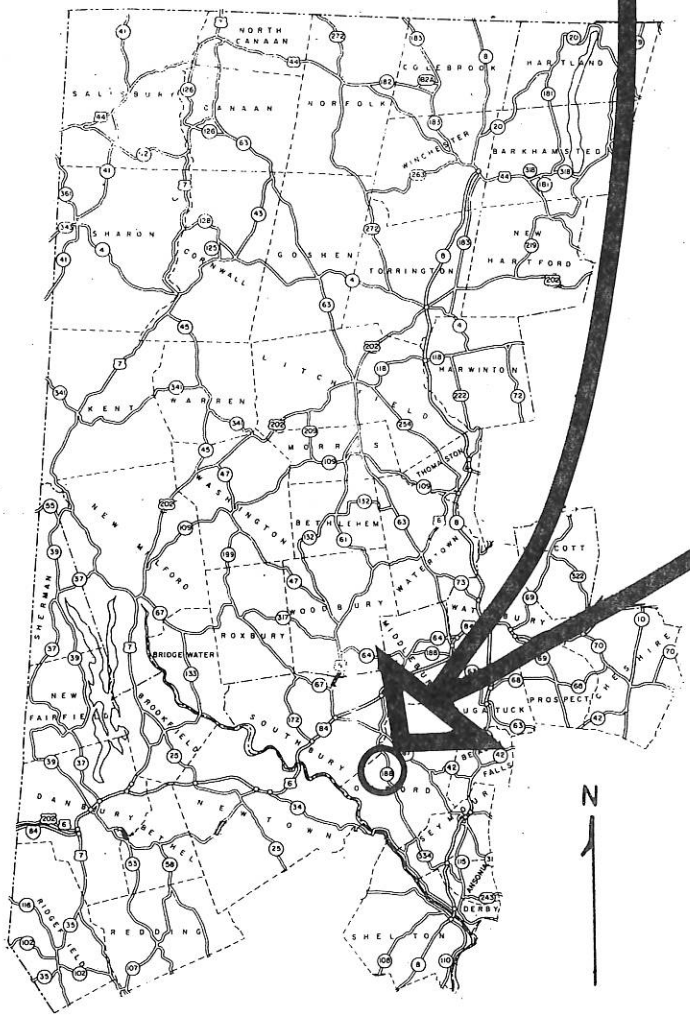
King's Mark Resource Conservation
and Development Area (RC&D)
Environmental Review Team
P. O. Box 30
Warren, Connecticut 06754

LOCATION OF STUDY SITE

MORNING THORPE





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This report is an outgrowth of a request from the Town of Oxford, with the subsequent permission of the landowners to the New Haven County Soil and Water Conservation District (S&WCD). The S&WCD referred this request to the King's Mark Resource Conservation and Development (RC&D) Area Executive Committee for their consideration and approval as a project measure. This request was approved and the measure reviewed by the King's Mark Environmental Review Team (ERT).

The Environmental Review Team draws together a range of experts in the fields of natural resources, engineering and planning, who, based upon existing available data and field investigation, formulate an analysis of a proposed land use activity.

The soils of the site were mapped by a soil scientist of the United States Department of Agriculture (USDA) Soil Conservation Service (SCS). Reproductions of the soil survey, a table of soil limitations for certain land uses, and a topographic map showing property boundaries were forwarded to all Team members prior to their field review of the site.

The members of the Environmental Review Team consisted of the following: Frank Indorf, Jr., District Conservationist, SCS; Charles Reynolds, Soil Scientist, SCS; Leon Gardner, Engineering Specialist, SCS; Timothy Dodge, Biologist, SCS; Richard Hyde, Geologist, Connecticut Department of Environmental Protection; Clifford McClellan, Jr., Sanitarian, Connecticut Department of Health, Duncan Graham, Executive Planning Director, Central Naugatuck Valley Regional Planning Agency; Carol Youell, Team Coordinator, King's Mark RC&D Area.

The Team met and field reviewed the site on Tuesday, October 26, 1976 and Monday, November 1, 1976. Reports from each Team member were sent to the ERT Coordinator for review and summarization for this final report.

This report is not meant to compete with private consultants by supplying site designs or detailed solutions to development problems. This report identifies the existing resource base and evaluates its significance to the proposed development and also suggests considerations that should be of concern to the Town of Oxford and the developers. The results of this Team action are oriented toward the development of a better environmental quality and the long-term economics of the land use.

The King's Mark RC&D Area Executive Committee hopes this report will be of value and assistance in making decisions on this particular site. If any additional information is required, please contact: Carol E. Youell, Environmental Review Team Coordinator, King's Mark Resource Conservation and Development Area, P. O. Box 30, Warren, Connecticut, 06754, 868-7342.

INTRODUCTION

The King's Mark Environmental Review Team was asked to review approximately 154 acres of land for which is proposed a 70 lot single-family home subdivision. The property is located just east of Route 188 and north of Hogsback Road in an area of west central Oxford known locally as Quaker Farms.

The plans for the site indicate the lots sizes will vary somewhat, but will average approximately 2 acres. The lots will be served by individual on-site water supply and waste disposal systems. Approximately 4.5 acres in the southeastern corner of the parcel is to be deeded to the Town of Oxford for open space use. Present land use includes steep wooded uplands and overgrown fields.

The Team evaluated the site in terms of its ability to support the development proposal by pointing out limitations, concerns and opportunities for development. Some aspects of the proposed development discussed by the Team include steep grades, drainage and on-site sewage disposal. The steep slopes and soil conditions impose many limitations for urban uses.

This report will describe the natural characteristics of the site including topography, geology, soils and wildlife; and will evaluate the different aspects of development as they relate to the natural resource base. Comments or recommendations made within the report are presented for consideration by the developers and the town in the preparation and review of development plans, and should not be construed as mandatory or regulatory in nature.

TOPOGRAPHY

The property in question is on the western-facing slope of a complex upland north-south running ridge and hill system between the Housatonic and Naugatuck Rivers. The property is part of the eastern valley wall of the Eight Mile Brook (river) which flows in a southerly direction until it empties into the Housatonic River at the Monroe town line. Even though no major streams traverse the subdivision area as shown on the Topographic Map, the site does have numerous intermittent natural drainageways through which surface runoff and ground water seepages drain and eventually empty into the Eight Mile River (see Soil Map).

The land surface elevation of the property is 338 feet above mean sea level along Route 188 but quickly rises to nearly 750 feet above mean sea level just east of the power lines along the eastern boundary. This is a rise of roughly 410 feet over a 3,400 foot lateral distance between the lowest and highest points with an average land slope value of 12 percent. Much of the property has slope values which are 10 percent or greater. The Topographic Map delineates those land areas where slope values are 15 percent and greater. This reveals that a large portion, possibly over 50 percent of the property, has severe slope difficulties. Such conditions require much higher levels of engineering input than the normal designs if future erosion and premature septic system failures are to be avoided within the property boundaries. In addition, if adequate control measures are not incorporated into the site development, there is the potential for the siltation of storm sewers feeding directly into Eight Mile Brook. If large numbers of septic systems should also fail, then the river's water quality could be further degraded.

BEDROCK GEOLOGY

The bedrock geologist is interested in the solid bedrock, its structure and composition. Bedrock is the solid rock, commonly called "ledge", that forms the earth's crust. It can be locally exposed at the earth's surface or more commonly buried beneath a few inches to as much as 200 feet of unconsolidated (loose, not firmly cemented or interlocked) deposits. The surficial geologist is concerned with the primary overburden, unconsolidated deposits, lying on top of the solid bedrock that have been relatively unaltered by the weathering process. The soil scientist, on the other hand, deals with the weathered zone of the surficial deposits, the upper 3 to 5 feet below the land surface.

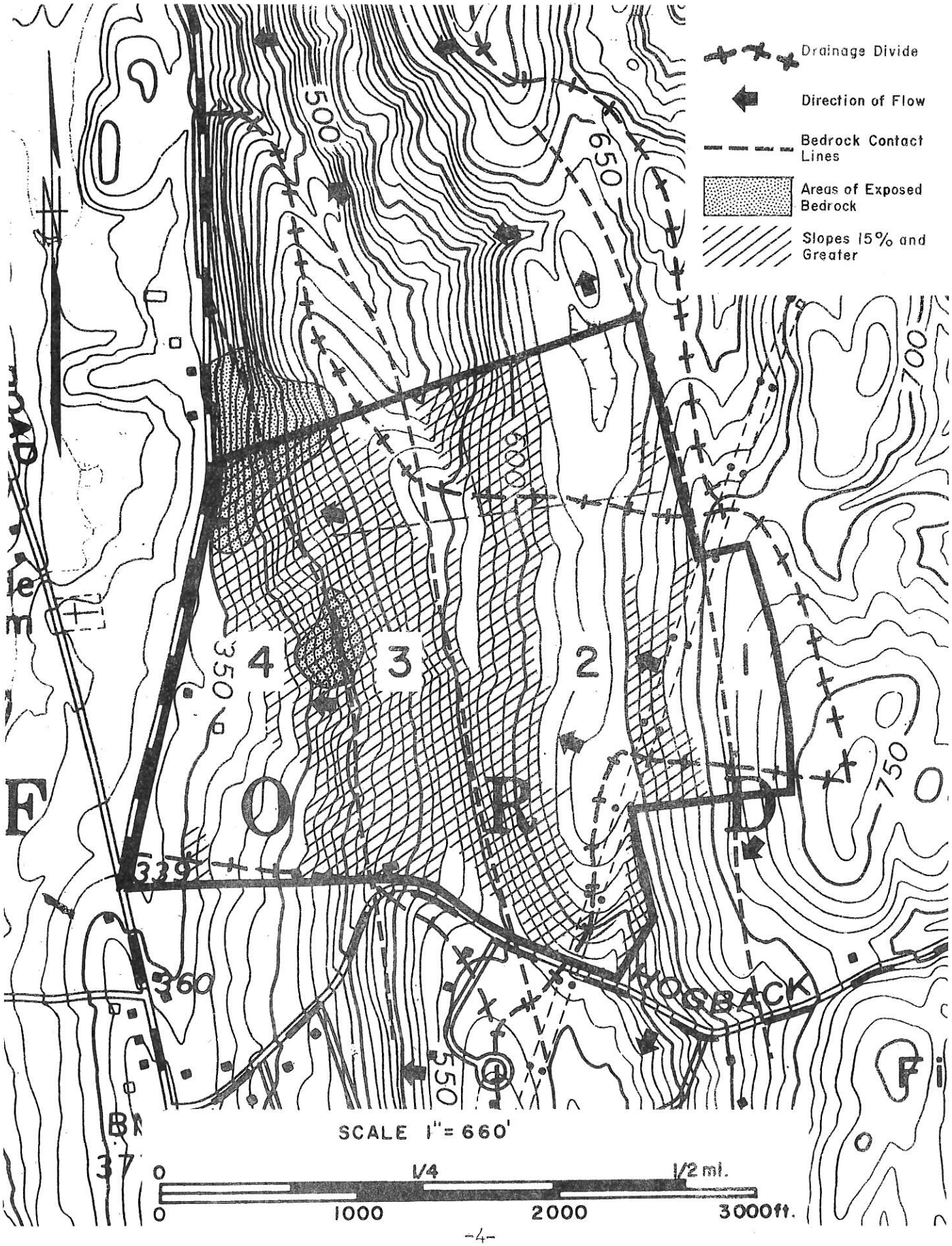
The Morning Thorpe property crosses four distinctly recognizable classifications of bedrock. All are metamorphic schists or gneisses or some variation or combination of both. The Topographic Map roughly outlines and enumerates their boundaries. (The "bedrock contact lines" indicate where the different bedrock units meet.) A schist is a rock that has formed under intense heat and pressure causing the micaceous mineral components to orient in a subparallel direction resulting in a layered appearance. Gneisses are more coarse grained banded rocks in which the granular minerals form layers that alternate with layers of schistose or dark flat minerals.

SURFICIAL GEOLOGY

The entire parcel of property except for a narrow strip along Route 188 is covered by the primary glacial material called till. The band of over-

TOPOGRAPHIC MAP

MORNING THORPE



burden materials along Route 188 is the eastern limit of ice-contact glacial materials that were deposited by the melting of active ice in the Eight Mile River Valley.

Glacial till is found throughout Connecticut and New England where glacial activity occurred in the past. It is developed in areas where glacial ice stopped its forward advance and melted in place, causing the debris that was picked up and carried on, in, and pushed along under the active ice to remain and be deposited. By definition, till or "hardpan" or "boulder clay", terms more commonly used by the non-geologist, is a heterogeneous material composed of various mixtures of boulders, gravel, sand, silt, and clay-sized particles, none of which are significantly sorted or stratified by grain sizes, as is the case with waterlain and windblown deposits. Till is simply the mass of material trapped by the glacier that remained in place after the ice melted. From this primary overburden lying on top of the bedrock surface develops the various detailed soil types. Detailed soil profiles form through a combination of mechanical, chemical and physical weathering processes, as well as through other local factors such as slope and drainage.

The till overburden thickness varies from place to place depending on the configuration of the bedrock surface and the historical deposition of the parent materials; however, generally in Connecticut, it averages from 10 to 15 feet thick. Based on the location of known bedrock exposures, it may be anticipated the depth to the underlying bedrock is close to the statewide average of 10 to 15 feet for most areas of the property. Exceptions are in those portions where bedrock is visible, and along a line running parallel with the contact of bedrock units 3 and 4. (See "bedrock contact line" between bedrock units 3 and 4 on the Topographic Map.) In the steeper areas along this line, bedrock is at the land surface and the overburden thickness has the greatest chance of being less than 10 feet thick.

SOILS

The physical characteristics of the site together with the natural processes operating within an area, create situations which can be beneficial or problematic to the proposed development. In addition to the geologic data, soil classifications provide a good indicator of the suitability of an area for development.

A detailed Soil Map of the site is given in the Appendix to this report along with a Soils Limitations Chart. As the map is an enlargement from the original field mapping, 1320'/inch scale to 660'/inch, soil boundary lines should not be viewed as precise boundaries but rather as guidelines to the distribution of soil types on the property.

The Soils Limitations Chart gives the proportional extent of each of the soils and indicates their probable limitations for various community uses including: on-site sewage disposal, buildings with basements, landscaping, and streets and parking lots. An explanation of the numbered ratings for particular land uses is provided on the last page of the Appendix. The Chart classifies the soils according to the Natural Soil Group in which they belong. Natural Soil Groups are useful when generally describing the nature of the soils on a site.

With the examination of the Soil Map and accompanying Chart, a correlation between the soils and surficial geology can be seen. The property is composed of soils in Natural Soil Groups A, B, C, and D. Soils in Natural Soil Groups B, C, and D are all upland soils that were formed in areas of till. These soils that have developed on glacial till comprise the majority of the site. Soils in Natural Soil Group A are the only exception and these are terrace soils underlain by water deposited beds of sand and gravel (stratified drift). They normally occur above flood plains in river and stream valleys. On the site they are found along Route 188.

Most of the property (90.9 percent) is composed of soils in Natural Soil Group C. Group C soils are upland soils which have developed over compact glacial till (hardpan). These soils are often stony and have formed with a slowly or very slowly permeable hardpan or fragipan at a depth of 16 to 36 inches below the soil surface. Permeability above the hardpan is moderate but the pan drastically reduces percolation and restricts the downward movement of water in the soil. Excess water from heavy rains, spring thaws or septage effluent absorption fields will move laterally downslope over the surface of the pan. At times, a temporary perched water table may form above the hardpan in wet seasons and after heavy rains. For example, soils types 31B and 31MC have a seasonal high water table that remains within 15 to 20 inches of the surface from fall through spring. During the review these soils were found to have a water table at approximately 18 inches below the surface in most places examined. Seep spots or wet spots are also quite common with hardpan soils. These occur seasonally on slopes as water moves laterally downslope above the hardpan and comes to the surface on the more concave portions of the landscape. In many cases seep spots form minor inland wetlands (see below).

There is only one soil type found on the site in Natural Soil Group B, 43M. (Group B soils are generally found in thicker deposits of till occurring on hillsides.) Soil type 43M is an inland wetland soil as defined under Public Act 155. Small narrow areas of this soil type occur along most of the natural drainageways found on the site with the largest area just west of the power lines. The Soil Map does not indicate all of these areas because they were impractical to map separately at the scale of mapping used. It should also be noted that small areas of other poorly drained inland wetland soils (mostly Ridgebury fine sandy loam - Natural Soil Group C-3a) exist on the site that do not appear on the Soil Map. They exist along the lower part of the slopes throughout the site. They range up to about an acre in size with most being less than one-half acre. They are essentially seep spots, and are wet from fall through spring and after heavy rains during the summer. During the field review, many of these poorly and very poorly drained soils were observed to have water within a few inches of the surface.

Soils in Natural Soil Group D comprise a very small portion of the site. Group D soils occur mostly in the rougher areas of the uplands. They may occupy narrow ridge tops but most often are on steep side slopes. These soils are underlain by hard bedrock with areas containing barren rock outcrops. In most places hard rock is less than 20 inches below the soil surface. Areas on the site where bedrock is at or near the land surface have already been described (see Topographic Map). It should be noted that bedrock is within a few feet of the surface in a few small areas of the 35MD soil type delineation in the northwestern portion of the site. (35MD belongs in Natural Soil Group C.)

Soils vs. Proposed Land Use

As shown on the Soils Limitations Chart, many of the soils on the site are rated as having severe limitations for urban uses. The site presents severe development problems due primarily to steep slopes and hardpan soil conditions with perched water tables. There are extensive areas of moderately well drained soils with seasonal water tables being within 16 to 18 inches of the land surface. This would cause severe limitations for the development of on-site sewage disposal systems, homesites with basements, homesite landscaping, and streets and parking lots. Extensive subsurface drainage systems will have to be described on the subdivision plan to demonstrate:

1. how the on-site sewage disposal systems will be protected from drowning out,

2. how basements will be protected against flooding,

3. how streets and parking areas will be relieved of the hydrostatic pressure developed on these soils which will cause streets to crack, freeze and heave during the fall, winter and spring months, and

4. how road bank cuts will be protected from bleeding water during these months.

In view of the above drainage problems: street drains will need to be slotted pipe to pick up subsurface water, driveways may need tile drainage (particularly those on the downslope side of streets) and homesites with basements will probably need foundation drains installed around footings. Drains should outlet into a storm drainage system or natural drainageway.

There are many seepage areas on the site that develop small minor inland wetlands that could cause serious problems concerned with all of the above mentioned problems. These areas need further investigation and evaluation by the Town of Oxford's Inland Wetlands Commission.

The intensity of development will cause increases in water runoff into all natural drainageways on the site. Increased runoff into natural drainageways will cause serious erosion problems if not properly handled. These drainageways will have to be rock lined so that deep gulleys do not develop. The present vegetative cover is adequate to control erosion until construction begins. The soils on the site, however, are very erosive when cleared of vegetation, and if left in an open condition for long periods of time severe siltation and sedimentation will take place to adjoining waterways. An erosion and sediment control plan will have to be developed to control erosion and sediment on and off the site. This will include silt traps, diversion waterways, hay bale erosion checks, and vegetative measures such as temporary and permanent seedings.*

Steep slopes will also cause serious development and stabilization problems. In some cases road grades will be steep with the resulting problems.

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* For further information concerning sediment and erosion control, and the design and layout of applicable conservation measures, consult the Erosion and Sediment Control Handbook for Connecticut, USDA, SCS, 1976.

Water and erosion problems as a result of development can be severe on areas downstream. Much of the runoff from this site exits to the west under Route 188 and across the adjoining farm land. Road culverts no doubt will have to be enlarged to handle storm runoff and to prevent flooding. The field ditch through the adjoining farm land will have to be rip-rapped with very large stone to prevent serious erosion damage.

In reviewing the subdivision plan, the following specific items should also be considered:

1. Care should be taken in the design and installation of drainage ditches within the drainage easements in lots 10, 11, 12, 13, 59 and 70 because of right angle turns of stream flow. Overtopping, especially during the construction period, could cause problems with downslope homeowners lots being eroded.

2. In addition to the 6 inch perforated drain as shown on the proposed street cuts, it is suggested that tile be place approximately 10 feet back from the top of all cut slopes and deep enough to intercept the water flowing on the pan layer, before it breaks out part way down the cut slope. This will allow grass seedings in the proposed jute net cover to grow evenly. This will also need to be a consideration for cut slopes around houses to keep lawns in a desirable condition.

Overall there are many inherent soil and water problems concerned with this site; however, they will not necessarily preclude the use of this site for development. All of the solutions to the above problems should be described in detail. In other words, a drainage plan, an erosion and sediment control plan, a storm water management plan, an improved site develoment plan fitting more closely to the topographic conditions, and a conservation plan of development is needed. Assistance with design and layout of necessary conservation measures is available from the New Haven County Soil and Water Conservation District. All of these plans should be reviewed by a competent engineer and soil conservationist. If all of these measures are not planned and incorporated into the overall development of the site serious environmental damage could occur to the area.

WILDLIFE AND VEGETATIVE COVER

The site is a combination of woodland containing mixed hardwoods and scattered conifers, and abandoned pasture overgrown with weeds and reverting to woodland. Hickory, ash, maple and birches dominate the woodlands. Perennial weeds characterize the most recently abandoned pastures, while young 6 to 8 inch diameter closely spaced hardwoods and shrubs are found in earlier abandoned areas. The density of understory shrub growth is moderate with some thickets scattered within the woodland. Numerous wet seep areas with dense growth of spicebush are present.

Collectively, the woodland and old field areas provide good quality habitat to woodland game and nongame animals. Old pasture areas vegetated with perennial weeds such as ragweed and goldenrod, shrubs such as multiflora rose, and wild grasses usually provide the best quality habitat due to the shrubby growth and diversity of plants. Woodlands surrounding old fields also benefit from them by the "edge" created. As old fields grow to hardwoods, their value to wildlife decreases because understory plants are shaded out.

Development to housing will reduce the acreage currently available to wildlife and will remove the old field area vegetation thereby reducing the quality of habitat. Disturbance factors to wildlife will also increase as will free roaming cats and dogs. Development should retain as much of the natural vegetation as possible and landscaping should utilize shrubs valuable to wildlife.

NATURAL HAZARDS

The orientation of the four bedrock types is almost directly north-south with the individual units dipping, plunging into the earth in a westerly direction at an angle of 40 to 60 degrees. In places where steep rock exposures are found, the likelihood for surface rock slides is a distinct possibility. Such problems are naturally aggravated by ground water flowing along the surface of the buried rock until the rock intersects the land surface in the form of a cliff face.

When man accelerates water movement through these delicate areas by disrupting and paving over the land surface, the risk of dangerous situations developing increases. It would appear only two locations on this property may have the potential for this type of problem; these are in those areas delineated as bedrock exposures on the Topographic Map.

WATER SUPPLY

Public water supply is not available at or near the site, therefore on-site water supply will have to be provided.

On-site water supplies may be obtained from the bedrock aquifer. The crystalline bedrock aquifer (the schists, schistose gneisses and gneisses) is composed of hard dense, tightly interlocking mineral grains that do not allow appreciable amounts of ground water to flow into a drilled well shaft. For this reason almost all water entering a well travels through any cracks or joints that happen to exist in the rock structure and are intersected by the well shaft itself. In most rocks, the largest and most numerous cracks and joints are encountered within the upper few hundred feet of bedrock; although, the distribution of these openings may be quite irregular, causing the potential yield of any specific well to differ widely from place to place. The heterogeneity of the crystalline bedrock and the steep dip of the various cracks and openings make it possible to drill a satisfactory well quite close to one that is not capable of producing much water. Moving to another drill site in a direction perpendicular to the general rock trend increases the chance of the well to intersect different and perhaps higher yielding rock openings. In the area of this site, this means moving east and west since the rock trend is north-south.

Based on a statistical study of over 1,300 bedrock wells in the Lower Housatonic area, it has been determined that 75 percent of wells drilled will yield at least 3 gallons of water per minute.

WASTE DISPOSAL

There is no municipal sewage disposal system in Oxford, nor is it anticipated in the area of this site in the future. Consequently, sewage disposal will have to be developed on-site.

Soil Survey mapping data, visual observations and consideration of the sloping topography would indicate that conditions in general are not particularly suitable for subsurface sewage disposal. A large percentage of the property is apparently underlain with hardpan soils which can restrict the downward movement of water and/or sewage effluent. This, coupled with steep slopes can cause the effluent to travel laterally with possible problems occurring downgrade of a system. In addition, there are numerous seep spots, natural drainageways and high water table conditions which are present seasonally on the site and pose severe limitations for on-site sewage disposal.

A number of considerations should be kept in mind regarding the layer of hardpan on the site. Percolation tests must be done in the hardpan layer (if it exists in an area planned for the location of a leaching system) since it is this layer that will eventually accept the sewage effluent. Septic systems must be sized according to the percolation rate in the hardpan layer and not in the more pervious subsoil above the hardpan. These percolation tests may reveal that this hardpan layer is, in fact impervious, thereby making the lots unsuitable for subsurface sewage disposal. Hardpan soils commonly have slow percolation rates. Slow percolation rates may require up to 1000 square feet or more of leaching area. This leaching area, along with its equal required reserve area, may take up large portions of the building lots.

Lots located in the northern and western areas of the site appeared to be very poorly drained (appoximately lot #60-70). The presence of bedrock outcroppings, running brooks and saturated soils would appear to render these lots highly unlikely to accept any type of viable subsurface sewage disposal system. It is urged that soil percolation tests be done on these lots before any formal approval is given. If the soil tests prove these lots unable to accept subsurface sewage disposal systems, final decision could be deferred to a later date. Adequate road construction and drainage, along with properly constructed curtain drains within the subdivision, may drain these lots sufficiently to make them acceptable in the future for subsurface sewage disposal.

Strict adherence to state and local health codes for the design and installation of all on-site sewage disposal systems is essential. In addition, close inspection of all well and septic installations will be very important.

ROADS

The property has frontage on a two lane hard surface improved town road, Hogsback Road. While vertical and horizontal alignment are typically rural and therefore difficult to traverse, it is not expected that the subdivision would increase the volume to any point nearing its capacity. Access from the subdivision to this road must be very carefully located so as to not impede regular traffic flow and to provide safe access to and from the site. This will be very difficult to accomplish given the geometry of Hogsback Road; however, it must be very carefully reviewed and solved. If it is not so handled, a very serious and potential accident point will be created. Some sort of loop system with access only from Route 188 may have to be considered.

Route 188, a state highway, provides the other major access and frontage. The geometry of this road is adequate and no problems are anticipated.

It was indicated that a variance would have to be requested to put in portions of the subdivision road network because the average slope is 12 percent and exceeds the town requirement. Twelve percent is also the recommended maximum gradient for two-lane town roads constructed with State aid whose average daily traffic is less than 50 vehicles. Design speed should not exceed 30 miles per hour. It should be noted that sections of the proposed roadway will have to cover some areas where land slope exceeds 15 percent. Roadway standards require strict enforcement if the town is not to be burdened with corrective costs in the future. Strict standards and enforcement will help in the minimization of other land use problems resulting during the subdivision development phase. Probably a maximum road slope of 8 percent would be more realistic and cause fewer problems.

Roadway drainage systems are normally constructed to accommodate road and roadside surface and near surface water runoff for established developments. Measures to minimize the input of eroded materials into such roadside drainage systems are highly recommended to protect the future effectiveness of the culvert system and to prevent the siltation and water quality degradation of Eight Mile Brook. During the housing construction phase, proper functioning will be more likely ensured through control of the size and time in which working areas are exposed to the forces of rain and snow, and through careful control of surface runoff from those areas into the roadway drainage system. The Topographic Map delineates the natural drainage system that will contribute to and be required to be controlled through the proposed roadway drainage system.

COMPATIBILITY OF SURROUNDING LAND USES

Urban land use in this general area of Oxford is principally very low density residential development. Active dairy farming, fodder crops and woodlands characterize the area. In general, the area is extremely rural and farm-like.

The Comprehensive Plan for the Town of Oxford, developed in December 1965, recommended this area for "open space rural residential". The plan states that due to the rugged topography west of Governor Hill and Punkup Roads ... resulting in high site development costs ... residential densities should be in the range of 5 to 10 acres per dwelling unit. While the plan is an advisory document and zoning prevails in law, the field review indicated that the Comprehensive Plan is probably more correct in its recommendations than are the present zoning requirements. (Present zoning for this area, Residence District A, requires a minimum lot size of 1½ acres.) In view of this, the developer may want to be encouraged to provide substantially larger lots so that development problems can be lessened.

The Central Naugatuck Valley Regional Planning Agency's Plan of Development, adopted in July 1975, classifies this area as residential limited development - nonclustered at a density of 0.5 (or less) dwelling units per acre net. While this residential classification indicates buildable land, reference to Agency back-up data shows this particular area with a mixture of unbuildable and buildable land which was then generalized at the map scale used as buildable.

ADDITIONAL COMMENTS

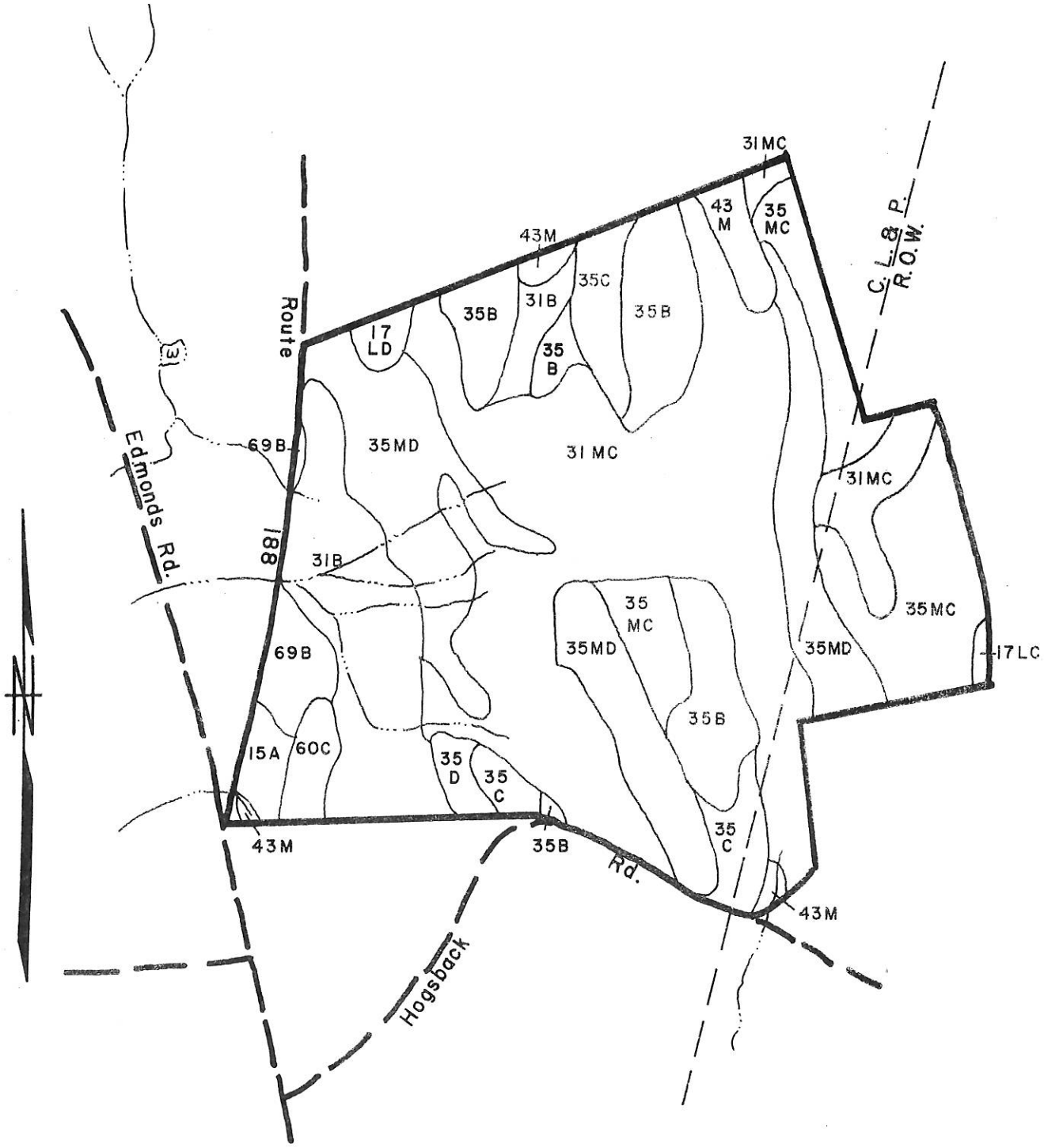
The town should very carefully scrutinize the desirability of taking title to the +4 acres offered by the subdividers as open space. With the overhead transmission lines on this parcel in the southeastern corner, its value is extremely limited. Given the overall density of development in this section of town, the need for municipally owned open space is questioned. It might be a better solution to simply incorporate portions of this open space in abutting lots. In this manner, the town would maintain some taxable income on that property and would not be saddled with maintenance and possible policing responsiblities.

APPENDIX

SOIL MAP

MORNING THORPE

Prepared by: USDA SCS 1976
Advance copy, Subject to change



SCALE 1" = 660'

0 1/4 1/2 mi.

0 1000 2000 3000ft.

SOILS LIMITATIONS CHART
Morning Thorpe Subdivision, Oxford

Natural Soil Group**	Mapping Symbol	Slope %	Approx. Acres	Percent of Total Acres	Limitation Ratings For*: On-site Sewage	Buildings with Basements	Land-scaping	Streets and Parking Lots	Principal Limiting Factor(s)
A-1b	60C	3-15	2.0	1.3	2	2	3	2	slope, droughtiness
A-1d	69B	3- 8	4.0	2.6	1	1	1	1	slope
A-2	15A	0- 3	2.0	1.3	3	3	1	2	seasonal water table
B-3b	43M	0- 5	4.0	2.6	3	3	3	3	very high water table, stoniness
C-1a	35B	3- 8	16.0	10.4	3	1	1	2	fragipan, slope
C-1b	35C	8-15	8.0	5.2	3	2	2	2	fragipan, slope
C-1c	35MC	3-15	19.0	12.3	3	3	3	2	stoniness, fragipan, slope
C-1d	35MD	15-35	20.0	13.0	3	3	3	3	stoniness, slope
C-1d	35D	15-25	2.0	1.3	3	3	3	3	slope
C-2a	31B	3- 8	19.0	12.3	3	3	1	3	fragipan, seasonal water table
C-2b	31MC+	3-15	56.0	36.4	3	3	3	3	stoniness, fragipan, seasonal water table
D-1	17LC	3-15	0.5	0.3	3	3	3	3	shallowness, slope
D-2	17LD	15-35	1.5	1.0	3	3	3	3	shallowness, slope
TOTAL			154.0	100.0					

* Limitation Ratings: 1 - slight; 2 - moderate; 3 - severe.
** Refer to Know Your Land, Natural Soil Groups for Connecticut, USDA Soil Conservation Service and Connecticut Cooperative Extension Service, for further explanation of the Natural Soil Groups.
\+ A few small areas within mapping unit 31MC have slopes steeper than 15 percent.

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. Detailed 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 the 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.

1. 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.

2. 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. The additional cost ranges from average to higher than average outlay when such areas are compared with areas rated as having slight limitations.

3. 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.