SANITARY LANDFILL SITE
OXFORD, CONNECTICUT

KING'S MARK
RESOURCE CONSERVATION AND DEVELOPMENT AREA

KING'S MARK
ENVIRONMENTAL REVIEW TEAM REPORT

on the

SANITARY LANDFILL SITE
OXFORD, CONNECTICUT
OCTOBER 1976

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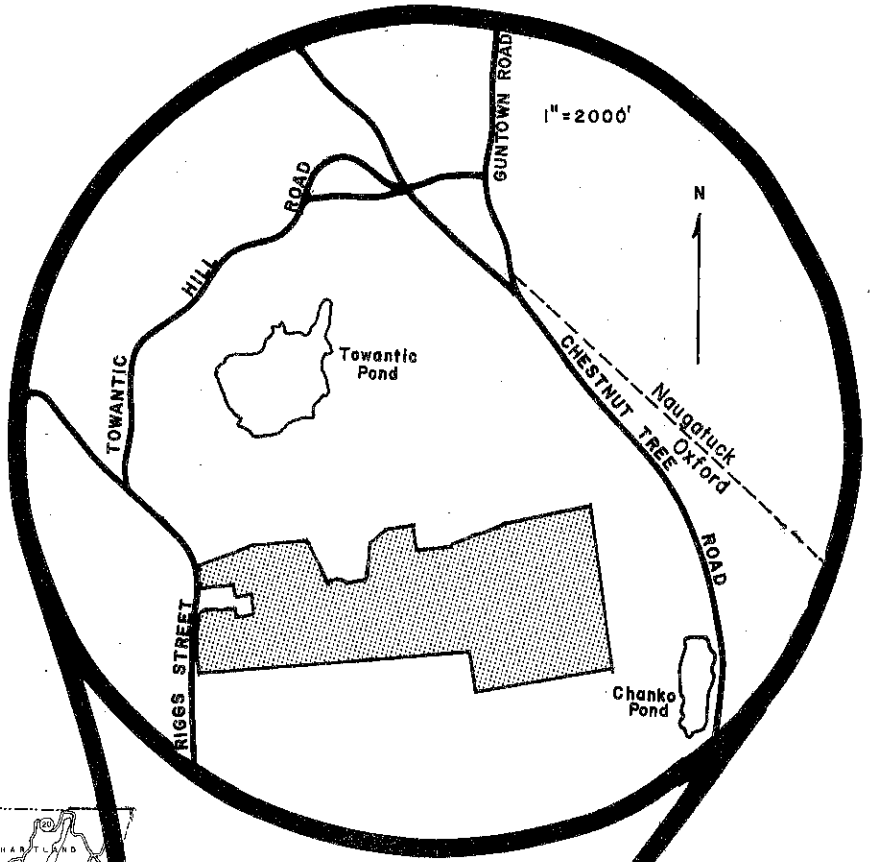
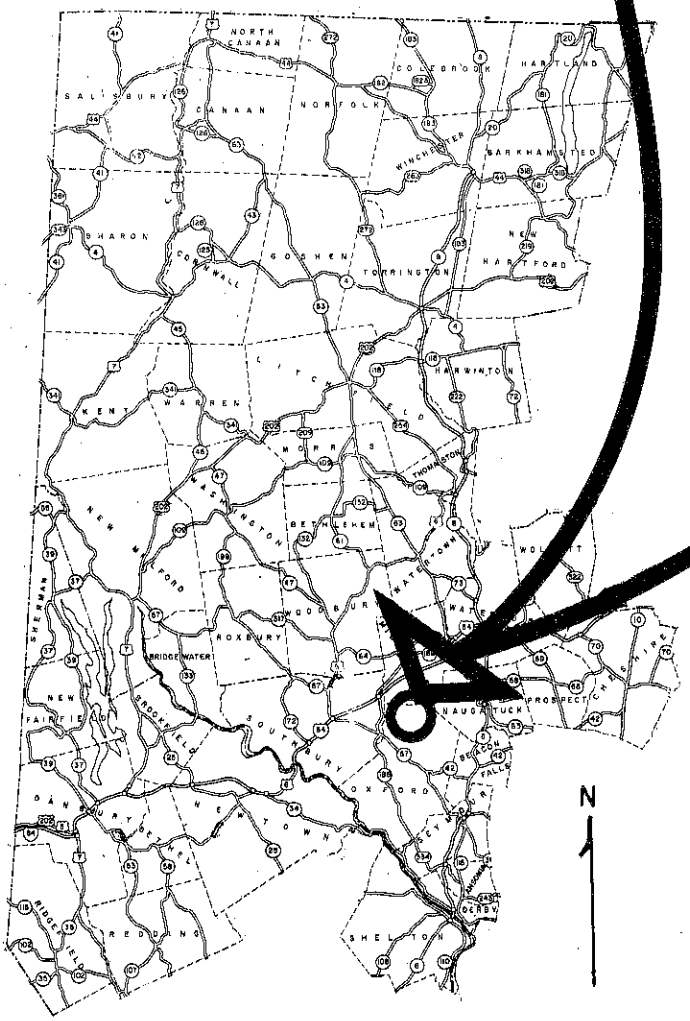
King's Mark Resource Conservation
and Development Area (RC&D)
Environmental Review Team
P. O. Box 30
Warren, Connecticut 06754

LOCATION OF STUDY SITE

SANITARY LANDFILL SITE

OXFORD, CONN.





ENVIRONMENTAL REVIEW TEAM REPORT
ON THE
SANITARY LANDFILL SITE
OXFORD, CONNECTICUT

This report is an outgrowth of a request from the Town of Oxford, with permission of the landowner, 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. The 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; Timothy Dodge, Biologist, SCS; Richard Hyde, Geologist, Connecticut Department of Environmental Protection (DEP); Virginia Mason, Regional Planner, Central Naugatuck Valley Regional Planning Agency; and Carol Youell, ERT Coordinator, King's Mark RC&D Area.

The Team met and field reviewed the property on Wednesday, July 29, 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 use of the land and also suggests considerations that should be of concern to the Town of Oxford and potential 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 a 130 acre parcel of land to determine its potential for supporting a sanitary landfill operation. The land, which is privately owned, is located in the northern section of town, just east of Riggs Street, almost directly across from the present landfill site.

The town is in immediate need of a suitable landfill area to serve its people temporarily, for approximately 10 years. The town has been ordered by the Connecticut Department of Environmental Protection to close its present facility.

The parcel investigated by the Team was one of four sites in the town initially reviewed by the Solid Waste Management Unit of the Connecticut Department of Environmental Protection. This site was found to have the most potential. The report by the DEP stated that "portions of the site appear to be suitable for a disposal area for the Town of Oxford of relatively small dimensions (3-6 acres) ... it is up to the town to next locate and purchase the most suitable 6 acres within the property." The King's Mark Environmental Review Team was called upon to further investigate the site's potential and to assess the impact of a landfill on the natural resources in the area. A series of test pits were made with a backhoe to allow the Team to better evaluate the ground materials on the site. Many of the pits were dug in the westerly portion of the property near the crest of the first ridge, as recommended by the DEP report.

The Town of Oxford is also concerned about other possible uses for the remaining ±120 acres of land if the site as a whole is acquired. The tract is presently undeveloped with the primary land use in woodland and over-grown fields.

The report will describe the natural characteristics of the site including topography, geology, soils, wildlife habitat, and forest cover. Consideration will be given to the compatibility and suitability of the proposal (as well as other suggested uses for the land) relative to the natural resource base. Comments or recommendations made within the report are presented for consideration by the town and potential developers in the preparation and review of plans and should not be construed as mandatory or regulatory in nature.

TOPOGRAPHY

The property extends east-west across the northern slopes of Towantic Hill. Towantic Hill is an elongate north-south feature controlled in all likelihood by the underlying bedrock. Topographically, starting at Riggs Street, the land surface elevation above mean sea level is 660 feet. Moving east, the land becomes quite steep, greater than 15 percent in places, and then levels off near the top of Towantic Hill where the land elevation reaches a maximum of 770 feet above mean sea level (see Topography Map). (A 15 percent slope means there is a 15 foot rise or drop in land surface elevation over a 100 foot horizontal distance. The steepest slope along the western boundary is actually a 75 foot change in elevation over a 500 foot horizontal distance.) The 130 acres crosses Towantic Hill in an area where a north flowing intermittent, seasonal brook divides the property into two distinct and elongate subhills. East of the brook, the land rises to a peak elevation of 730 feet above mean sea level.

The land surface drainage from all of the property eventually enters the Naugatuck River to the east. However, drainage from the property contributes to at least five distinct sub-drainage systems: two to the west flowing south, one to the north and one to the east flowing northeast, and one to the east flowing south. The north and northeast drainages enter the Naugatuck River within the City of Naugatuck while the three southerly flowing brooks enter the Naugatuck River at Seymour center via the Little River. Approximately one-third of the property drains into Towantic Pond to the north, one-half of the property (eastern section) drains into Chanko Pond and Towantic Brook flowing south, while the western section along Riggs Street drains into Riggs Street Brook and Jacks Brook also flowing south.

SURFICIAL GEOLOGY*

In terms of the overburden material, the primary unconsolidated deposits lying on top of the bedrock surface are known as glacial till by the geologist. The entire 130 acres is underlain with glacial till except for some possible thin stratified sand and gravel deposits along the eastern margins. From this parent material, the various soil types develop in the upper 3 to 5 feet below the land surface when different local physical settings and weathering processes are present. Glacial till is the predominant overburden material found in Connecticut today. It was formed when the glacial ice melted, releasing the debris that was trapped on, in, and that which was pushed along under the active ice. As melting occurred, some of these particles were carried away by the meltwater streams to form the stratified sand and gravel deposits primarily found in stream valleys, but much of the debris just dropped in place once glacial activity ceased. This property is located in such an area. By definition till, "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 particles, none of which are significantly sorted or stratified according to particle grain sizes, as is the case with waterlain and windblown deposits. To restate, till is simply the mass of various sized particles that remained in place after all glacial ice melted,

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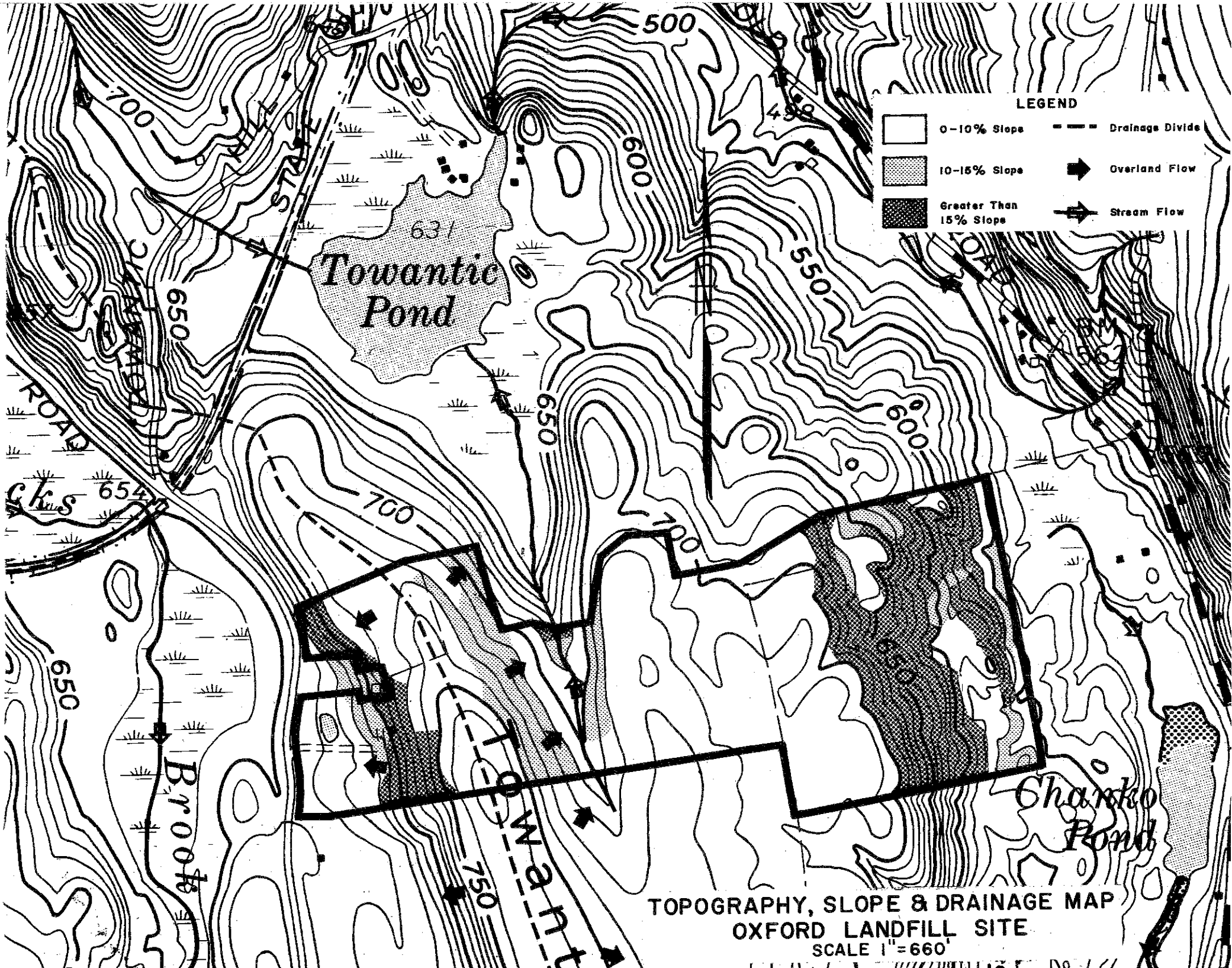
* The surficial geologist is concerned with the primary overburden, unconsolidated deposits, lying on top of the solid bedrock that have been relatively unaltered by the weathering process. The bedrock geologist is interested in the solid bedrock, its structure and composition; while the soil scientist deals with the weathered zone of the surficial deposits, the upper 3 to 5 feet below the land surface.



TOPOGRAPHY, SLOPE & DRAINAGE MAP
OXFORD LANDFILL SITE
SCALE 1"=660'

The thickness of till overburden varies from place to place but averages 10 feet to 15 feet throughout the state. During the site visitation, several test pits were dug with a backhoe along the western and northern flanks and the top of the western prong of Towantic Hill. Bedrock was not encountered during the digging nor have many outcroppings of bedrock been mapped by Mr. Michael Carr in his "Geologic Map of the Naugatuck Quadrangle, Connecticut", Quadrangle Report No. 9, 1957. Apparently Mr. Carr was only able to locate a single outcrop on the property which is situated just behind the old house off Riggs Street; although, there are many more in the Oxford areas of this hill system and some in the steep areas southwest of Chanko Pond. Based on this information and the test pits dug on-site, it would appear the till overburden is probably thickest at the top and northern flank of Towantic Hill. In these areas overburden may be 15 feet to 25 feet thick; however, to be certain, on-site drilling would be necessary.

The type of till occupying the hill is a very sandy variety which indicates much of the clay and silt particles had previously been removed during deposition. In fact, the test pits revealed numerous but small stratified sand lenses, indicating much water was associated with the deposition process of this particular till.

BEDROCK GEOLOGY

The type of bedrock underlying Towantic Hill is identified as the Waterbury Gneiss, defined as a heterogeneous sequence of quartzites and biotite-muscovite schists interbanded with gneiss. Schists and gneisses are crystalline rocks which have been deformed, metamorphosed, which is the result of deep burial within the earth where intense heat and pressure altered the original rock. The one outcrop behind the old house dips to the west at an angle of 55 degrees.

SOILS

A detailed Soils Map of the entire 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, the 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 sanitary landfill uses.

With the examination of the Soils Map and accompanying Chart, a correlation between the soils and surficial geology can be seen. All of the soils on the ±130 acre site fall within Natural Soil Groups B, C, and D (see first column of Chart). Soils in these groups are all upland soils that were formed in areas of glacial till.

Group B soils are generally found in the thicker deposits of till occurring on hillsides. These soils (32MC, 32D, 43M) comprise 23 acres of the property. Stones and large boulders are common in these soils and add difficulty when excavating or earth moving operations are needed. Soil type 43M is classified as an inland wetland soil under Public Act 155, the Inland Wetlands and Water Courses Act.

Group C soils occur mostly on the tops and sloping sides of hills or drumlins* and have a hardpan generally 16 to 36 inches below the soil surface. Hardpans (or fragipans) restrict the downward movement of water in the soil. Permeability above the hardpan is moderate but the pan drastically reduces percolation. During wet seasons excess water in the soil moves downslope over the surface of the hardpan. Group C soils on the site (35B, 35C, 35XC, 35MC, 35D, 35MD, 31XB, 31MC) comprise a total of 70.5 acres. The stones and large boulders commonly found in these soils again add difficulty when excavating or earth moving operations are needed.

Group D soils are found mostly on steep side slopes and narrow ridge tops. They are characterized by stoniness and shallow depths to bedrock which cause severe problems when developing this land for urban uses. These soils are underlain by hard bedrock and areas may contain barren rock outcrops. Group D soils on the site (17LC, 17LD, 17MD) comprise a total of 37 acres.

AESTHETICS AND PRESERVATION

General Description

The site is primarily in woodland. The western portion of the property consists of old fields which are reverting back to woodland. Vegetation in the old field areas consists of perennial weeds such as goldenrod, shrubs such as nannyberry and blueberry, and trees including wild cherry and birches. The woodland consists of mixed deciduous hardwoods including oak, hickory, white ash, and red maple.

Wildlife

Good quality wildlife habitat is provided to a variety of game and non-game animals. Species utilizing this type habitat include whitetail deer, raccoon, gray squirrel, songbirds, birds of prey, ruffed grouse, and small mammals.

Recent logging operations have thinned portions of the woodland which will allow shrubs and young hardwoods additional sunlight to stimulate growth. In addition, the old field areas provide elements of "edge" for wildlife; increasing the habitat quality for animals such as the ruffed grouse. Fleshy fruit bearing shrubs, trees, and vines including apple and wild grape, are common in the old field areas and further increase the habitat values.

Potentials for maintaining and/or improving habitat for woodland type animals is generally good. The steeper areas would require more intensive management than the flatter areas.

Impact of a Landfill

Landfill activities in general would increase the disturbance factors to wildlife. Some omnivorous species such as the raccoon would be drawn to a landfill area, possibly becoming a nuisance.

Removal of 10 acres of habitat for landfill purposes should not significantly reduce the quality of existing habitat. As a landfill area reaches

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* Drumlins - hills that were smoothed and elongated north to south by the movement of glaciers (i.e., Towantic Hill).

its capacity and is retired, it should be reseeded. Reseeding with grasses and legumes would increase the area's value to wildlife.

SANITARY LANDFILL - POTENTIAL HAZARDS AND CONSIDERATIONS

The proper location for any landfill is to a certain extent dependent upon the site conditions and, of course, the techniques employed by the operator. The prime concern is to minimize the effects of leachate produced when refuse comes in contact with ground water and/or surface water infiltrating the ground water table. This is especially critical when the landfill site is steep such as in this case. There may be, for example, areas to the west where natural springs seep ground water onto the land surface. However, by minimizing leachate production of the landfill site itself, through proper disposal and grading procedures, contamination of any natural springs should be prevented.

The type of landfill operation implemented, trench or surface cell (area landfill), depends upon where the bedrock surface and the seasonal high water table is located on-site. Bedrock appears to be no problem on the main Towantic Hill ridge and probably is no problem either on the eastern hill. In other words, there is probably a sufficient depth of overburden till material above the bedrock surface. However, hardpan soil conditions (Natural Soil Group C) and a seasonal high ground water table could produce difficulties if the trenching method of land filling is to be utilized. Seasonal high water table values should be obtained through direct observation during the melting periods of the year. They could not be accurately determined during this site review.

Hardpan was encountered in several of the test pits but it appeared to be fairly deep throughout the western and eastern hill-top areas where test pits were dug. The soils map of this site describes the soils in the area of the western ridge as Paxton fine sandy loam (soil types: 35B, 35C, 35XC, 35MC, 35D, and 35MD). Slopes in this area vary from 3-8 percent to a steep slope gradient of 15-35 percent. Generally Paxton soils have a hardpan located at 18-24 inches below the soil surface. This is borne out on some areas of the site mainly through the central portions of the lower flatter areas along the northern boundaries to the highest sections in the south central portions of the property. The areas on either side of this central area have soils with much greater depths to the hardpan; averaging about 5½ feet to the pan on the western side slopes to +6 feet along the eastern slopes. In one area a deep test pit was dug to over 7 feet with no pan indicated.

This would indicate that sufficient cover material is available on the site to provide proper amounts of cover to maintain proper relationships of cover to landfill interface. It should be remembered that even though the till is very sandy in this region, hardpan is still difficult to work with during winter months. Sandy till materials are very deceiving once removed from a test pit, they are very loose to the observer, but in place are as resistant to removal as to the downward movement of ground water.

Topographically, the hardpan seems to be located at a fairly constant elevation with the difference in elevations being the 5 to 7 feet of overburden. Although the underlying hardpan is relatively deep over a great portion of the property, it is relatively impervious to the downward movement of free or gravitational water. This water will move downslope over the pan, closely following the general topography of the area. This could

cause some leachate pollution to shallow wells supplying water to homesites in the immediate vicinity. It is possible that some pollution could be carried far enough to get into the wetland areas and the pond located in the western portion of the site.

If shallow dug wells become polluted it would be necessary to replace them with deep drilled wells with impervious steel casings. Conservation measures such as tile drainage may be needed to safely remove subsurface drainage away from these areas and into safe outlets or areas where the pollution could be treated.

Other conservation measures may be necessary to control surface runoff from the landfill site. These would include diversions, waterways, and outlets, as well as land grading and shaping. It will be necessary to maintain a good grass or grass legume cover over those areas where the landfill site is brought up to final grade.

Because of the soil conditions along the access to the site, maintaining a good gravel road into the landfill area is highly recommended. Since no gravel is located on the property, it will be necessary to haul in gravel to maintain the access road. If the hill on the eastern portion of the property were to be considered by the town as a possible site, it is not hard to conceive that access costs would be much higher and installation more difficult than if the western hill were utilized. One additional positive aspect of developing the western hill is that the subsurface flow from such a landfill operation would be principally toward the Jacks Brook drainage system which is already handling any leachate produced by the town's existing sanitary landfill west of Riggs Street.

It is recommended that a resource conservation plan be formulated for this 130 acre site should part of it be developed as a sanitary landfill for the Town of Oxford. This plan would be developed between the town and the New Haven Soil and Water Conservation District with the assistance of the Soil Conservation Service.

EVALUATION OF ITEMS RELATIVE TO THE PROPOSAL AND/OR OTHER POTENTIAL USES FOR THE SITE

Water Supply

Water supply in Oxford is either through private wells or the Seymour Water Company. A connection to the Seymour system would be approximately 5 miles from the southeastern corner of this parcel.

Waste Disposal

Oxford does not have municipal or community waste water facilities. A study of municipal service through Seymour is currently being undertaken, but will not affect this site. This lack of utilities will affect potential uses of the remaining property not utilized in the landfill operation.

Transportation

Riggs Street is a narrow rural route which connects with Connecticut Route 67. Since much of the route to this site is undeveloped or in low

residential usage, no major adverse effect is anticipated as a result of the proposed landfill. The current landfill site is also located off Riggs Street. No major modifications in the road network are expected.

Services to Support Development

For that portion of the property which will be used as a landfill, the major service necessary will be the internal circulation on the property. The present road providing access is an abandoned driveway-logging road and its improvement has already been discussed.

Alternative uses of the property which have been suggested are industrial park and recreation and open space. Development as an industrial park would require additional support services, such as public utilities, housing opportunities, traffic controls, and educational facilities. Recreation and/or open space usage would require site planning to buffer the landfill area and perhaps development of facilities for active (intensive) and passive (extensive) recreation uses.

Compability of Surrounding Land Uses

The surrounding land uses are primarily single family residential and undeveloped uses such as open space and farming. A major industrial park is zoned by the town on both sides of Riggs Street south of the property, but this park has no utility services and has not yet been developed. Use of the site as an industrial area would be compatible with this zoned park, if developed. However, development of the property for a variety of recreational uses would be compatible with the current undeveloped character of Riggs Street.

ALTERNATIVE LAND USES FOR THE AREA

The alternative land uses to be considered are for those portions of the property not involved with the landfill. Alternative uses will depend in part on the location and development of the landfilling. At this time, the owner is selling the property as one parcel.

Physically and aesthetically, this property appears to be well suited to outdoor recreation activities. The town may want to consider this as an alternative use of the entire site or as an additional use of the site. Further investigation would be required; however, both active and passive activities appear to have potential.

Use of the property for recreation and open space is not recommended by the Central Naugatuck Valley Regional Planning Agency. In 1973, Oxford had 224 acres of municipally owned land, substantially more than the 60 acres deemed desirable by the Central Naugatuck Valley Regional Planning Agency's standard of 12 acres per 1,000 persons. Also, Oxford is not projected to have a deficit of municipally owned recreation and open space land by 1990.

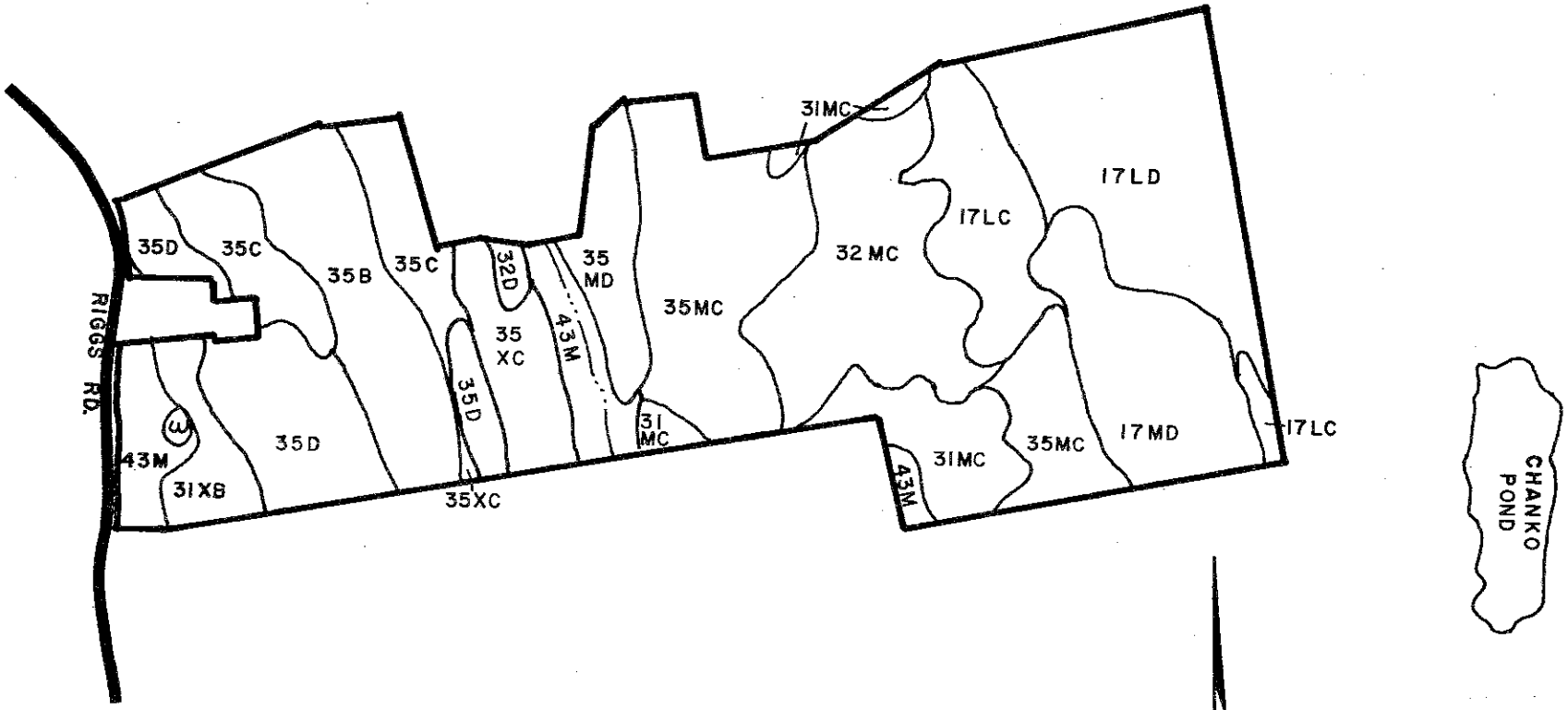
Use of the remainder of the property (that not involved with the landfill) for industrial purposes is also strongly not recommended by the Central Naugatuck Valley Regional Planning Agency. Oxford currently has more industrially zoned land than can reasonably be expected to develop. Overzoning of land for

industry can be considered a tool for minimizing housing opportunities. The Central Naugatuck Valley Regional Planning Agency expects that most industrial development in Oxford will occur along Route 67 and Route 486 in the vicinity of the Waterbury-Oxford Airport.

The Central Naugatuck Valley Regional Planning Agency is concerned that the town must acquire such a large parcel for the use of so little acreage for a sanitary landfill. No alternative demand for the remainder of the property is foreseen. If a smaller portion of the property cannot be acquired, either an alternate site or a transfer station should be considered.

It should be noted that this site under review has not been identified in the Regional Solid Waste Study in preparation by Gilbert Associates for the Council of Governments of the Central Naugatuck Valley.

APPENDIX



SOIL MAP

OXFORD LANDFILL SITE

SCALE 1"=660'

SOILS LIMITATIONS CHART
Sanitary Landfill Site, Oxford

Natural Soil Group	Mapping Symbol	Slope %	Approx. Acres	Percent of Total Acres	Limitation Ratings and Principal Limiting Factors For: Trench Sanitary Landfill	Area Sanitary Landfill	Daily Cover for Landfill
B-1c	32MC	3-15	14.0	10.7	Severe: seepage, large stones	Severe: seepage	Poor: large stones
B-1d	32D	15-25	1.0	0.8	Severe: seepage, slope	Severe: seepage, slope	Poor: slope
B-3b	43M	0- 5	8.0	6.1	Severe: wetness, seepage	Severe: wetness, seepage	Poor: wetness
C-1a	35B	3- 8	10.5	8.0	Slight: ---	Slight: ---	Fair: small stones
C-1b	35C	8-15	8.5	6.5	Slight: ---	Moderate: slope	Fair: small stones, slope
C-1b	35XC	8-15	5.5	4.2	Moderate: large stones	Moderate: slope	Fair: large and small stones, slope
C-1c	35MC	3-15	19.0	14.5	Severe: large stones	Moderate: slope	Poor: large stones
C-1d	35D	15-25	11.5	8.8	Moderate: slope	Severe: slope	Poor: slope
C-1d	35MD	15-35	5.0	3.8	Severe: slope, large stones	Severe: slope	Poor: slope, large stones
C-2a	31XB	3- 8	3.5	2.7	Severe: wetness	Severe: wetness	Fair: large and small stones
C-2b	31MC	3-15	7.0	5.3	Severe: wetness, large stones	Severe: wetness	Poor: large stones
D-1	17LC	3-15	8.0	6.1	Severe: seepage	Severe: seepage	Fair: small stones
D-2	17LD	15-35	18.0	13.7	Severe: slope, depth to rock, seepage, large stones	Severe: slope, seepage	Poor: slope, thin layer, area reclaim, large stones
D-2	17MD	15-35	11.0	8.4	Severe: slope, depth to rock, seepage, large stones	Severe: slope, seepage	Poor: slope, thin layer, area reclaim, large stones
-	W (Pond)	-	0.5	0.4	---	---	---
TOTAL			131.0	100.0			