environmental review team report

PROPOSED INDUSTRIAL PARK

Putnam, Connecticut

RC&D

EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT

ASSISTED BY: U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE AND COOPERATING AGENCIES

ENVIRONMENTAL REVIEW TEAM REPORT
ON
PUTNAM INDUSTRIAL PARK
PUTNAM, CONNECTICUT

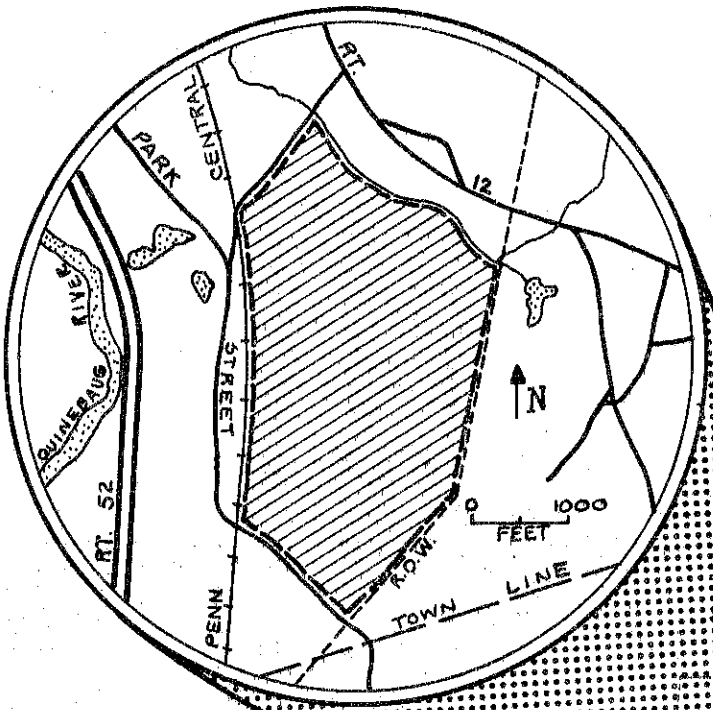
FEBRUARY, 1977

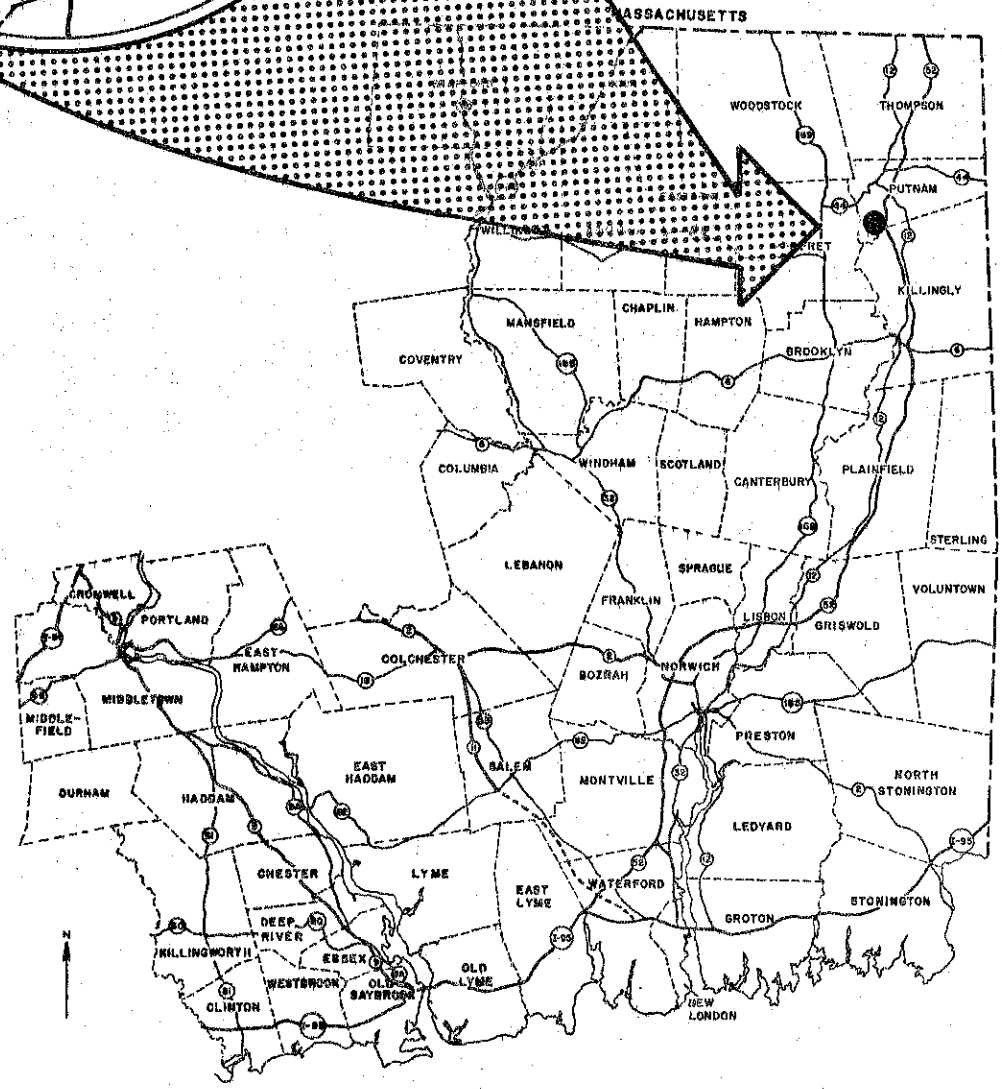
The preparation of this report was assisted by a grant under Title 1, Section 107(a)4 of the Housing and Community Development Act of 1974, 24 CFR, Part 570, Section 570.406.

EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT PROJECT
Environmental Review Team
139 Boswell Avenue
Norwich, Connecticut 06360

LOCATION OF STUDY SITE

PROPOSED INDUSTRIAL PARK
PUTNAM, CONNECTICUT





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ON
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PUTNAM, CONNECTICUT

This report is an outgrowth of a request from the Putnam First Selectman, with permission of the landowners, to the Windham County Soil and Water Conservation District (S&WCD). The S&WCD referred this request to the Eastern Connecticut Resource Conservation and Development (RC&D) Area Committee for their consideration and approval as a project measure. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

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 soils limitations for certain land uses, and a topographic map showing the proposed industrial park property were forwarded to all Team members prior to their field review of the site.

The Team that field-checked the property consisted of the following personnel: Al Weeks, District Conservationist, SCS; Ed Murdock, Soil Conservation Technician, SCS: Tim Dodge, Wildlife Biologist, SCS: Robert Miller, Geologist, Connecticut Department of Environmental Protection (DEP); Joseph Piza, Fisheries Biologist, DEP, Justin White, Forester, DEP; David Miller, Climatologist, University of Connecticut Extension Service; Malcolm Shute, Sanitarian, Connecticut Department of Health; Charles Boster and Jon Hedu, Regional Planners, Northeastern Connecticut Regional Planning Agency; and Linda Simkanin, ERT Coordinator, Eastern Connecticut RC&D Area.

The Team met and field-reviewed the site on Thursday, November 18, 1976. Reports from each Team member were sent to the ERT Coordinator for review and summarization.

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 any developers and the Town of Putnam. 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 Eastern Connecticut RC&D Area Committee hopes you will find this report of value and assistance in making your decisions on this particular site.

If you require any additional information, please contact: Miss Linda M. Simkanin, Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, 139 Boswell Avenue, Norwich, Connecticut 06360, 889-2324.

INTRODUCTION

The Town of Putnam proposed to develop as an industrial park a 180 acre tract of land located near the town's south boundary with Killingly, east of Connecticut Route 52. Current access into the property is from Industrial Park Road (in the vicinity of the Agway Company) although access is also possible via Park Street along the southwest border of the parcel. The land is currently zoned for industry, and considerable industrial and commercial uses presently exist along the west side of Park Street, with some uses existing between the east side of Park Street and the railroad tracks.

The Environmental Review Team field-checked the site relative to the proposal to create an industrial park. At the time of the review, no engineering feasibility study of site plan had been prepared for the property.

This ERT report will describe the natural characteristics of the site including topography, geology, soils, and forest cover. Consideration will be given to the compatibility and suitability of the development relative to the natural resource base, as well as to the existing development pattern including roads and utilities. Comments or recommendations made within this report are presented for consideration by the town or any developers in the preparation and review of the individual industrial site development plans, and should not be construed as mandatory or regulatory in nature.

TOPOGRAPHY AND GEOLOGY

The site, which is on the east side of the Quinebaug River, occupies a broad hilltop adjacent to the Quinebaug River valley. Elevations range from approximately 250 feet at the level of Park Street to a maximum of 438 feet on a southern peak of the site. Slopes exceed a 15% grade along the western edge of the property which rises sharply from Park Street, and also along the northern edge from Culver Brook. Refer to Topography and Drainage Map on the following page.

Surficial Geology

The entire site is composed of a surficial material known as till. Till is a glacially formed mixture of grain sizes from silt to cobbles. The till was formed by the action of the glaciers as they pushed and ground their way over the bedrock surface. The chipped-off bedrock was picked up by the ice or ground against the bedrock forming even finer particles. As the glaciers later melted and began to retreat, they left behind this covering of broken up bedrock material, known as till.

Till-covered hills are not uncommon in glaciated areas and many of these usually exhibit a shallow to bedrock surface. No depth to bedrock or drilling information was available for the site investigated but numerous bedrock outcrops were observed during the field review. The thickness of the till material probably does not exceed a maximum of 15 feet.

Because of the nonhomogeneity of grain sizes in till, it makes for a poor construction aggregate. Some sand and gravel was observed on the north-east side of the property, along Culver Brook, but its quantity and quality were undetermined.

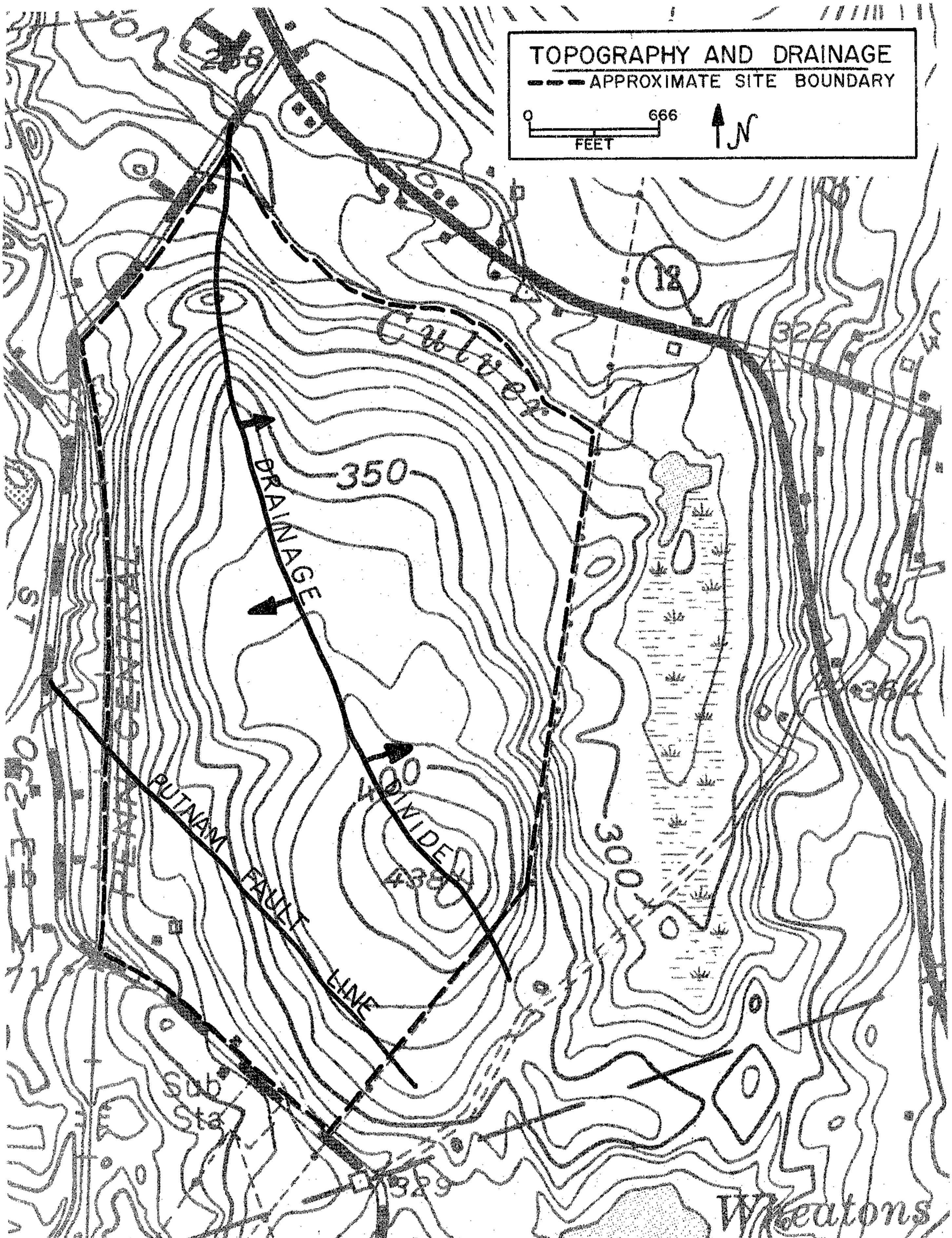
Bedrock Geology

The bedrock of the site is composed of a heterogeneous group of gneiss type rocks known as the Quinebaug Formation. These rocks are probably of volcanic origin. The most abundant rocks within this group are medium-to-dark greenish-gray in color. Their grain size is fine-to-medium and the major minerals are a combination of biotite-quartz-andesine gneiss, and biotite-hornblende-quartz-andesine gneiss.

The rocks are typically well layered, with layers a few centimeters in thickness. These are composed of less abundant amphibolite, calc-silicate gneiss and stituent in all layers. Accessory minerals include sphene, rutile, zircon, apatite, allanite and opaque minerals.

The southeast corner of the site is characterized by a group of rocks known as the Black Hill Member of the Quinebaug Formation. These type rocks are non-resistant, light-to-dark gray in color, fine-grained in texture, and are layered in layers of a few centimeters in thickness and commonly show intense, small-scale folding.

The southern portion of the site is crossed by the Putnam Fault which traverses in a north-west to south-east direction. The up side of the fault is to the north and the down side of the fault is to the south. This fault is generally responsible for the different rock types found within this area. The


TOPOGRAPHY AND DRAINAGE
APPROXIMATE SITE BOUNDARY
0
666
FEET
N
Culver
350
DRAINAGE
DIVIDE
400
438
300
PUTNAM FAULT LINE
322
364
Sub Sta
329
Wheatons
12

fault has not been active in recent times. Refer to Topography and Drainage Map.

Hydrology

Surface water from the site runs off into two different drainage areas. The area is essentially divided in half with drainage from the northeast section draining into the Culver Brook drainage area and drainage from the southwest section draining into roadside drainage ways and not into any established water course.

The Culver Brook drainage area drains 1.87 square miles with the northeast section of the site contributing .169 square miles or approximately 9 percent. The normal 12-hour 2-year rainfall will produce approximately 125 cubic feet per second (cfs) from the Culver Brook drainage area. The 12-hour 100-year rainfall event will produce approximately 1200 cfs. Development of the site is not expected to have much of an impact on either of these flows although an engineering study should be performed when building and parking lot locations have been suggested..

Since the site will be provided with public water and sewers, there will be little, if any, problem of ground water pollution although a study of predicted industrial wastes should be initiated to establish the handling capabilities of the town's sewage treatment plant.

SOILS

A detailed soils map of the site and a soils limitations chart are provided in the Appendix of this report. As the map is an enlargement from the original 1320'/inch scale to 660'/inch scale, the soil boundary lines shown should not be viewed as absolute boundaries but rather as guidelines to the distribution of soil types on the property. The soils map, along with the Soil Interpretations report, Windham County Soil and Water Conservation District (USDA, SCS, 1975), can serve as an educational tool regarding the identification and interpretation of soils.

The soils limitations chart for certain land uses which is found in the Appendix of this report, provides useful information concerning each soil type found on the proposed industrial park site. An explanation of the numbered ratings for particular land uses is provided on the last page of the Appendix. In general, the greatest limiting factors to the industrial development could be slope. With careful building design and actual placement of structures and paved surfaces, steep slope areas can be used to aesthetic advantage within the industrial park development.

The soils on this site can be grouped in three natural soil groups. About 15% of the soils on the site are in Natural Soil Group A. (Refer to the Limitations Chart in the Appendix of this report). Group A soils are terrace soils over sands and gravels. The soils are generally well drained with droughtiness and slope being the chief limiting factors. Hinckley, Windsor, and a Hinckley-Windsor complex are the dominant soil types in the Group A soils on this site. These soils are all excessively drained soils developed in sandy deposits (Windsor) and stratified sandy, gravelly and cobbley water deposits (Hinckley), and are usually deeper than 10 feet.

The water table is below 40 inches most of the year, and these soils have a rapid to very rapid permiability in the subsoil. Hinckley soils are usually found on undulating to rolling terrace topography above the present overflow of large streams.

About 58% of the soils on the site are in Natural Soil Group B. These are upland soils over friable (easily crumbled) to firm gracial till. The dominant soil series of this Group on the site is Canton (mapping units 3XB, 3XC, and 3C). Canton soils are largely well drained, and developed in upland till normally deeper than four feet. These soils are rapidly permeable in the subsoil but slowly to very slowly permeable layers may be present below 40 inches. The water table is normally below 40 inches during most of the year. Canton soils are naturally stony and contain few to many stones through the soil. Gravel size rock fragments generally make up 10-30% of the surface and subsoil. Slope and stoniness are the chief limiting factors associated with Canton soils.

The remaining 27% of the soils on this site are in Natural Soil Group D. These are upland soils of a rocky and shallow to bedrock condition. In addition to being shallowly underlain by bedrock, many bedrock outcrops are visible. In most places, bedrock is less than 20 inches below the soil surface. The Charlton-Hollis series 17LC and 17LD comprises the D group soils on this site. Of the two soil types, 17LC is the more gently sloping unit consisting of two soils, Charlton and Hollis, which occur in patterns too intricate to separate in mapping. The Charlton portion of the unit is a well drained soil developed in upland till normally deeper than four feet. The water table is normally below 40 inches most of the year. Charlton soils are naturally stony and contain few to many stones throughout the soil. Slope and stoniness are the chief limiting factors to development. Hollis soils make up the other portion of the mapping unit, and are somewhat excessively drained soils developed in sandy material over bedrock. Hollis soils comprise the shallow to bedrock portion of the mapping unit, and are a few to 20 inches deep over the bedrock. They occur on uplands where surface bedrock outcrops vary from few to numerous and varying amounts of surface stones are present. These soils have rapid permiability. Most land use problems are related to the shallow depth to bedrock, droughtiness, slope, and rock outcrops. Due to economics, these shallow soils are generally not suited for intensive development but can provide open space and a visual relief to the developed landscape.

FOUNDATION DEVELOPMENT AND GRADED CONDITIONS

About 41% of the site would have slight limitations for buildings with basements. Another 27% would have moderate limitations because of seasonal high water-table, slope and soil conditions. The remaining 32% would have severe limitations due mostly to steep slopes, wetness and shallowness to bedrock. Substratum support would be variable in the areas adjacent to the railroad spur because the area would have to be leveled for building locations. Differential settlement could be a problem if the fill material is not placed properly. When foundations are placed on a homogeneous subsoil of uniform depth, the chances of differential settlement are slight. However, when placing foundations on fill material, the consolidation is not only dependent on the type of fill material, but also on the degree and uniformity of the compactive effort applied by the contractor during the filling or leveling operation. Appropriate tests should be conducted to determine the suitability of the fill material and to insure its proper placement.

Cut banks should not exceed 2 to 1 or a drop of one foot in two feet of length. On fill, the banks should be 3 to 1 or a drop of one foot in three feet of length.

Experience indicates that with 3 to 1 or flatter slopes, maintenance such as mowing, fertilizing and liming can be easily accomplished.

EROSION AND SEDIMENTATION CONTROL

Provisions should be made to prevent excessive erosion and sedimentation during development. It would be desirable for the Town to require the developer to prepare a plan for erosion and sedimentation control prior to breaking land. The plan should show the construction timetable, the proposed handling of disturbed areas, and the provisions for surface water control. Components of effective erosion and sedimentation control can include both mechanical and vegetative measures.

Mechanical measures include: land grading of only those areas going into immediate construction; diversions to intercept and divert rainfall runoff without causing harmful effects on land users within a watershed's downstream area; storm drains to dispose of runoff from streets, parking lots, and buildings; catch basins; sediment basins to detain runoff and trap sediment; grassed waterways and/or lined channels; drop structures to safely carry water to protected outlets; and the installation of permanent roads as early as possible.

Vegetative measures include: keeping much of the area under existing vegetative cover and keeping areas devoid of cover exposed for the shortest practical period of time; temporary seeding of cover crops plus mulching to stabilize areas during construction; and establishment of permanent vegetative cover after construction.

Connecticut's Erosion and Sediment Control Handbook published by the Soil Conservation Service will aid both the developer and the town in preparing and approving an adequate erosion and sediment control plan. Standards and specifications for both mechanical and vegetative practices listed within the Handbook are available at the Windham County Soil Conservation Service office, Wolf Den Road, Brooklyn, Connecticut.

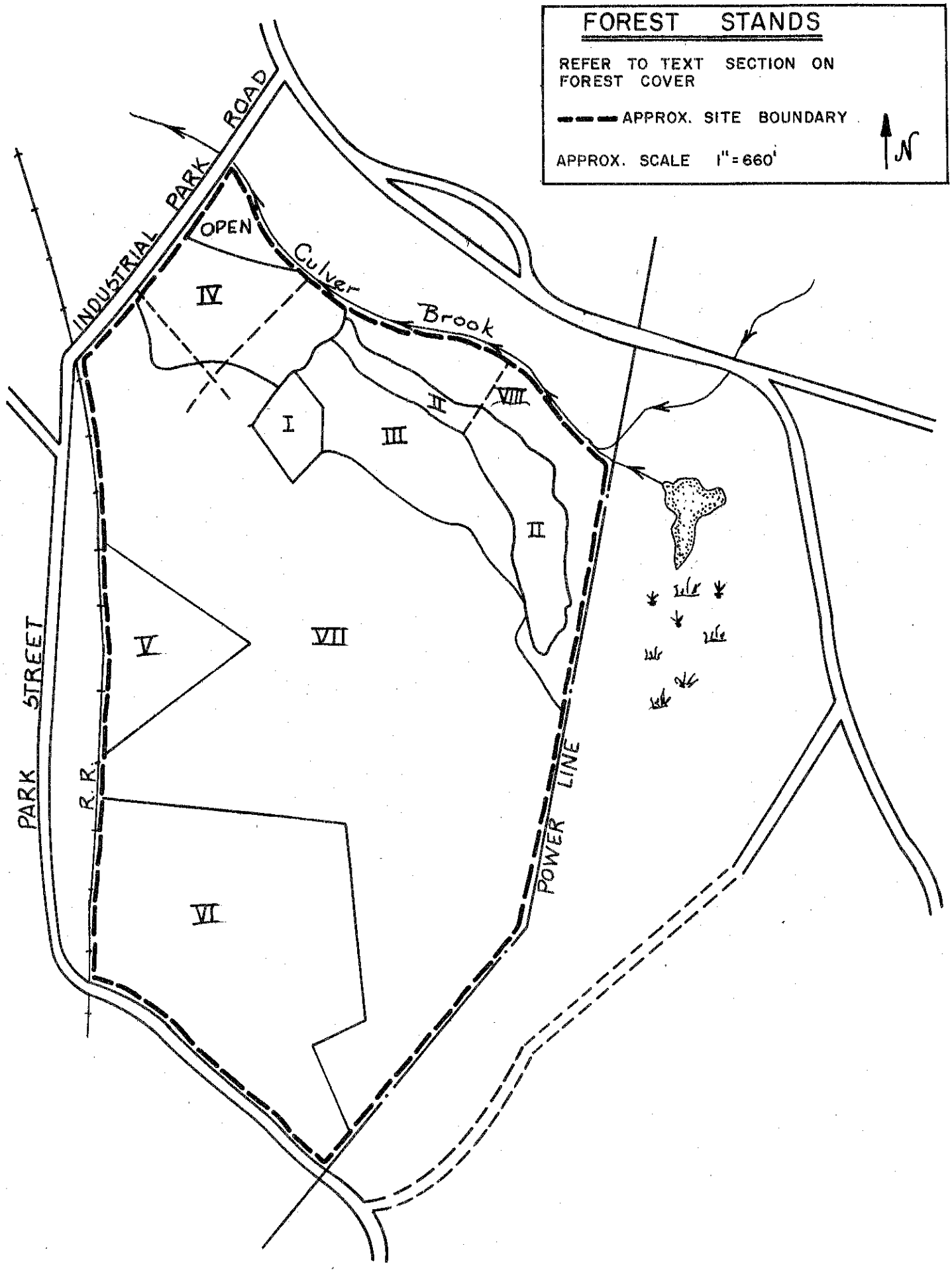
VEGETATIVE AND FOREST COVER

Examination of the site revealed that for all practical purposes the area can be considered forested. Remnants of old fields are present in the southern portion of the site, adjacent to Route 12, and along the powerline which forms the eastern boundary of the site. Less than 20% of the total site is in the old field condition, with the balance being forested. Principal tree species include oaks, cherry, birch, white pine, and maple. Because of the droughty soil condition and the west exposure (approximately one-half of the site is a west slope) the oaks appear to dominate the site. The northern end of the site is forested mostly in white pine and pitch pine. These conifer stands add variety to the otherwise deciduous tree growth and should be managed to add beauty and diversification to the site.

A thorough investigation of the forest cover revealed eight distinctly separate forest stands. For discussion purposes, the following text has been correlated to the Forest Stand Map on the following page. It should be noted that on the basis of their actual location, the few, scattered old field areas are included in the appropriate forest stand discussion.

Stand I - Area approximately 3 acres.

This stand is composed of pole and sawlog size white pine of good quality. The


FOREST STANDS
REFER TO TEXT SECTION ON FOREST COVER
APPROX. SITE BOUNDARY
APPROX. SCALE 1" = 660'
N
INDUSTRIAL PARK ROAD
OPEN
Culver Brook
IV
I
III
II
VIII
II
V
VII
VI
PARK STREET
R.R.
POWER LINE

site is better than average for growth of white pine as exhibited by the trees present. The stand age is approximately 35-50 years. Presently the stand is slightly overstocked, however growth is continuing at a very acceptable rate. The average board foot volume presently averages approximately 21,000 bd. ft./acre.

Stand II - Area approximately 8 acres.

This stand is composed mainly of sawlog size white pine on a similar growing site to that of Stand I. Again this stand is slightly overstocked, however, growth is somewhat slower than in Stand I. The quality of the timber in this stand is medium, the stems being very limby and not of a superior form. Portions of the stand are presently used for pasture for livestock and some open areas are included in the stand boundary.

Presently sawtimber volume in the stand averages approximately 20,000 bd. ft./acre.

Stand III - Area approximately 10 acres.

Stand III is composed of pole and small sawlog and pole sized scarlet and black oak, and red maple. There is a white pine understory of from 200 to 500 stems per acre. The hardwood overstory is of inferior form and quality with a present volume of approximately 800 bd. ft./acre sawtimber and 15 cords of cordwood.

Should this stand remain as a forest stand following development, the hardwood overstory should be clear cut to release the white pine.

Stand IV - Area approximately 10 acres.

Stand IV is composed of slowgrowing pitch pine about 40 years of age with a very slight composition of white pine and mixed hardwoods. There is essentially no sawlog volume present. The stand is slightly overstocked and does have a pulpwood volume of approximately 20 cords/acre.

Stand V - Area approximately 7 acres.

Stand V is composed of pole sized mixed hardwood of very poor form and vigor. Stand age is approximately 50 years with no sawlog volume. There is a white pine understory present of approximately 100 stems per acre.

Stand VI - Area approximately 36 acres.

This stand is composed of abandoned agricultural fields in all stages of forest succession. Presently the area is in a condition that has an excellent wildlife population due to the variety and availability of feeds of all kinds as well as abundant cover and shelter. There is a small amount of merchantable size timber present in the old field white pine and in the scarlet oak and red maple, which is present in patches throughout the area.

Stand VII - Area Approximately 100 acres.

This stand covers the largest single portion of the proposed industrial park. It is presently occupied by a mixture of white oak, scarlet oak and red maple poles approximately 40 years of age. The site is one of low productivity for hardwoods, this fact being demonstrated by the poor form and growth of the present stand.

The average volumes for the stand are approximately 10 cord of hardwood cordwood per acre, and approximately 1200 bd. ft. of low quality sawtimber per acre; the sawtimber lies mainly in the central portion of the stand.

Stand VIII - Area approximately 5 acres.

This stand occupies the wetland along the southerly border of Culver Brook and is occupied by a mixture of red maple, white pine, various oaks and the usual wetland shrubs. There appears to be nothing unique or unusual about this area.

The Forest Stands present offer little or no limitations from a development standpoint. Stands I, II, III, IV and VIII are highly visible from Route 12 and offer an aesthetically pleasing view from that highway. These stands also provide a buffer for runoff from the hill into Culver Brook and tend to filter the water of sediment and allow for gradual runoff. With the exception of Stand VIII there are highly merchantable products present in these stands and through proper management, these stands could continue to be productive and provide a variety of forest products for the future.

There are local markets for the forest products present. Marketing assistance is available from the Department of Environmental Protection, Forestry Unit, Room 262, State Office Building, 165 Capitol Avenue, Hartford, Connecticut.

FISH AND WILDLIFE HABITAT

Wildlife habitat provided by the site is primarily of a woodland nature. The quality varies from fair to good. The best habitat is provided by the old field areas where a mix of openland and woodland occurs. Here food and cover for cottontail rabbit, ruffed grouse, songbirds, gray squirrel and other small mammals is good. The northern half or more of the site provides fair habitat. Droughtiness of soils and tree canopy development limit growth of understory plants reducing food and cover available to wildlife.

Much of the understory growth is sparce which is typical of somewhat droughty soil conditions. The understory contains lowbush blueberry, young oak and birch, and scattered virburnams and white pine. Lesser amounts of highbush blueberry, mountain laurel, pipsisewa and club mosses are present. Understory growth on the west slope is similar, however, more favorable growth conditions increase density of plants. The old field areas remain partially open. Little bluestem is the common grass in open areas. Clumps of spreading juniper and red cedar are also scattered throughout. Brushy growth includes blueberry, raspberry and pokeweed. White pine and an occasional apple tree are also present.

The railroad, powerlines, and brook provides some diversity of vegetation and edge between woodland and open areas. In particular along the powerlines on the eastern border of the site, young oak seedlings, little bluestem, sweet fern, goldenrod, and other weedy species are present. Joint uses of the site as an industrial park and for wildlife appears compatible as long as buildings are carefully placed and vegetative cover removal is kept at a minimum.

Fish Habitat

The northern boundary of the proposed industrial park site is formed by Culver Brook. This is a feeder stream to the Quinebaug River and is approximately two miles long. It is important to prevent any encroachment on this brook. Any increase in silt, warming up the water from drainage of the industrial parking lots, roofs, etc., will have an effect on the Quinebaug River. Due to a projected Shad, Sea Trout, and

Alewife Restoration Project for the Quinebaug River and adjacent streams, it is important to keep stream flow from all streams entering the Quinebaug River cool and free from silt and impurities such as litter, oil, or grease drippings from asphalt parking lots and roads.

Of concern also is the large wetland located east of the site (refer back to the Topography Map). As Culver Brook drains this swampy area and pond, the same pollution concerns apply to this wetland. As the site slopes steeply down to both the wetland area and Culver Brook, it will be important to address these pollution concerns in any erosion and sedimentation plan prepared for the site.

AESTHETICS AND PRESERVATION

Although development of the site will reduce both quality and quantity of habitat, industrial development is compatible with existing land use to the west and south of the site, and would not interfere with existing mobility of wildlife. Because the northern portion is somewhat limited in potential for good habitat development it is more desirable for development to industrial purposes, but special care must be given to the protection of Culver Brook. Adjacent to the brook, the wetlands are mostly wooded to red maple. These areas should be protected from development by a buffer of undisturbed vegetation on all sides. Development plans should call for retention of as much native vegetation as possible and landscaping should utilize plants beneficial to wildlife. In disturbed areas where yearly maintenance is not planned, a seed mixture containing both crown vetch and tall fescue (KT-31) should be considered. Areas to be mowed, should be seeded with good lawn mixtures and yearly maintenance including fertilizer and lime requirements should be determined by soil testing.

As mentioned previously, woodland stands containing conifers should be managed to beautify the area. Only areas where buildings and parking lots and roads are to be located should be disturbed. These aspects of the development should be carefully located with tree removal kept at a minimum. This will preserve the character of the area as seen while on the site and also as viewed from a distance. Since the site is a hilltop and is highly visible from the west (and especially from Route 52), low profile structures that blend with the landscape are desirable from an aesthetic standpoint.

CLIMATOLOGY

The overall climate of the area is typical of Northeastern Connecticut with relatively mild winters and cool humid summers.

Mean Annual Air Temperatures	48°F
Annual Heating Degree Days	6600
Mean Annual Precipitation	46 inches
Mean Seasonal Snowfall	50 inches
Average date of last occurance of 32° temp.	May 10
Average date of first occurance of 32° temp.	Sept. 30

Air Quality Consideration

The site has the potential of both direct and indirect sources of air pollution. The direct sources of industries could lower the air quality. However, this type of source can be predicted fairly accurately with a given industry and measures for lowering emissions can be incorporated into the plans. With the proximity to residential and agricultural uses, any industry which would significantly lower air quality should not be permitted. Indirect sources arising primarily from increased traffic, are more difficult to predict. Not only is traffic at the industrial site of consideration, but also increased traffic on Route 52.

The site is on a hill therefore most pollutants will dissipate as rapidly as the general weather condition will allow. The site is southeast of the heavily populated center of Putnam and the prevailing summer winds are from the South and Southwest. They are actually from the SE about 10% of the time in the summer and almost never in the winters. Prevailing winds during periods of good weather during the winter are from the northwest. Therefore air pollutants generated at the site will not threaten the densely populated city most of the time. But occasionally they will.

Nighttime inversions and valley downslope air flow will be from North to South in the Quinebaug River Valley and from SE to NW in the Culver Brook valley. Therefore a problem might exist if industries which product air pollutants at night are located on the North and East facing slopes of the site. In these locations the flows in the Culver Brook valley during inversion conditions will carry from the site to the city.

The most serious possibility is that the mixing of relatively small amounts of air pollution from this site, the Killingly Industrial Park to the South, and vehicle exhause from Route 52 will significantly decrease the air quality over the entire area.

ROADS

High speed, interstate access to the site is provided by Route 52, a four-lane, divided, limited access highway which is located to the west of the proposed industrial park site. There are two interchanges located north and south of the site. At present the highway is completed to Oxford, Massachusetts. It will eventually run north to the Massachusetts Turnpike. The road is presently under-utilized and can easily accomodate additional traffic. Existing local roads will need upgrading to handle anticipated increased traffic volumes into the proposed industrial park. Points of access into the site should be carefully considered to insure the best traffic flow pattern which will be compatible with surrounding local roads and existing land uses.

New interior roads within the proposed industrial park could pose major problems due to steep slopes and the limited access points into the property. The existing Providence and Worcester Railroad which forms the western boundary of the site presents a severe design constraint in terms of road access into the property. A railroad runs to an area that could be used for heavy industry. Grades for this railroad spur appear satisfactory but should be checked with qualified railroad personnel.

A proposed railroad siding could be installed, starting at a point where the present Providence and Worcester Railroad crosses the Industrial Park road and extends in a southernly direction for approximately 2500 feet and 300 feet east of the present Providence and Worcester railbed. The elevation at Industrial Park road is approximately 267 feet and at the 2500 foot point, the elevation is approximately 320 feet. On a 2.1% grade, the cuts would be 0 to 4.5 feet and the fill from 0 to 8 feet. On a 2.2% slope, the cuts would be 0 to 5.5 feet and the fill from 0 to 6 feet.

WATER SUPPLY

Public water supply is available to service the site as existing lines are located to the west of the site. A new municipal well has been developed west of the site. Depending on the needs of the proposed industrial users it should be capable of providing suitable quantities of water although the size of the piping should be examined to determine adequacy depending on projected needs with reasonable extensions of transmission lines.

WASTE DISPOSAL

Public sewers are available to service the site. The new Putnam sewage treatment plant has the capacity to handle future effluent from industrial uses; an existing large capacity collector now services existing industry via the Industrial Park road, and it would appear that other areas could be serviced by gravity extensions. The size of the sewer line and the ability of the present system to handle increased flow must be determined. Depending on the type of waste, an industry may have to provide treatment prior to discharging to the public sewer system. The type of refuse or solid waste, and liquid type discharges, as well as accidental contaminations should be considered through each department involved prior to each industrial acceptance.

SERVICES TO SUPPORT DEVELOPMENT

Adequate community services exist within Putnam. Day Kimball Hospital is within several miles of the site. State police and the Putnam police and the Fire departments are available to the site.

COMPATIBILITY OF SURROUNDING LAND USES AND ALTERNATIVES

The proposed industrial development of this site appears compatible with other industrial uses which presently exist to the west of this site along Park Street. The scope of this site design should include recognition of surrounding land uses and incorporate into its development plan some areas of open space between the existing uses and the more intense proposed development areas. As an example, one of Putnam's oldest houses abuts the site on the west, and up until now, no efforts were made by existing development to create any visual buffers for this house or other pre-existing non-industrial uses.

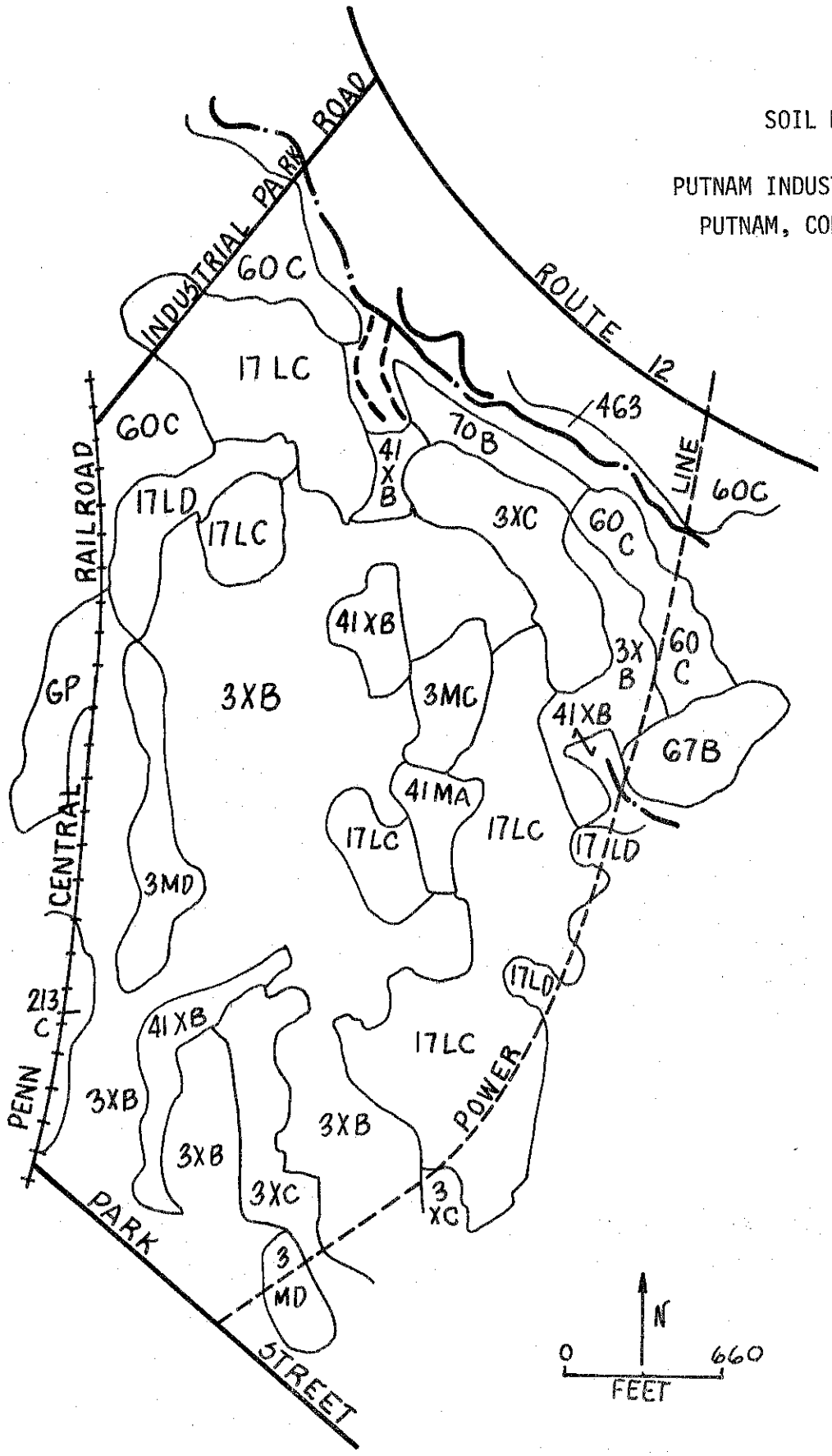
Concerning any alternative land uses for the site, the severity of the topography could make development of other land uses such as housing more difficult and

costly and therefore less feasible than industrial development. An open space, forested use might be the only reasonable alternative to the proposed industrial park use. If developed as an industrial park which appears to be a reasonable use on this site in terms of its location, highway access, and available utilities, there should be some guarantee that the new industrial development employ basic conservation measures and camouflaged industrial building design in order to provide the Town of Putnam with aesthetically pleasing economic resource.

APPENDIX

SOIL MAP

PUTNAM INDUSTRIAL PARK
PUTNAM, CONNECTICUT



The map is an enlargement from the original 1,320'/inch scale to 660'/inch.
Prepared by: UNITED STATES DEPARTMENT OF AGRICULTURE, Soil Conservation Service.
Advance Copy, Subject To Change. 1976

PUTNAM INDUSTRIAL PARK

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
Windsor	A-1a	67B	5	2.7	Droughtiness, slope, texture	1	1	1	3
Hinckley	A-1b	60C	5)	6.5	Droughtiness, slope	2	2	3	3
Hinckley-Windsor Complex	A-1b	213C	7)-			2	2	3	3
Merrimac	A-1d	70B	2	1.1	Droughtiness, slope	1	1	2	2
Canton	B-1a	3XB	72	39.2	Droughtiness, slope	1	1	2	1
Canton	B-1b	3C	3)	10.3	Slope, fragipan, droughtiness, seasonal high water table, stony	2	2	3	3
Canton	B-1b	3XC	16)-			2	2	3	3
Canton-Charlton	B-1c	3MC	2	1.1	Stony, slope	2	2	3	3
Canton-Charlton	B-1e	3MD	7	3.8	Stony, slope	3	3	3	3
Sutton	B-2a	41XB	5	2.7	Seasonal high water table, slope	2	2	2	2
Sutton	B-2b	41MA	3	1.6	Seasonal high water table, stony	2	3	3	3
Charlton-Hollis	D-1	17LC	44	23.9	Shallow to Bedrock, slope	3	3	3	3
Charlton-Hollis	D-2	17LD	5	2.7	Shallow to Bedrock, outcrop	3	3	3	3
Raynham	G-3a	463**	8	4.4	High water table	3	3	3	3
TOTAL:			184	100.0					

* Urban Use Limitations: 1 = slight; 2 = moderate; 3 = severe (see back of this page for a further explanation of limitation classifications).

** Inland Wetland Soils as defined by Public Act 155, as amended.

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.