

Environmental Review Team Report
Mercier Gravel Excavation
Brooklyn, Connecticut

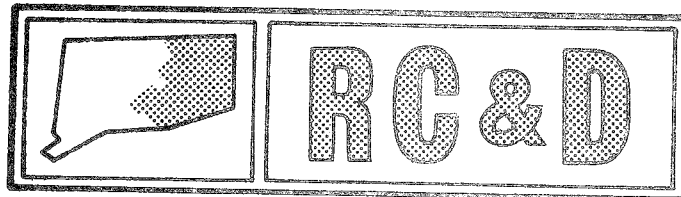


EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

Environmental Review Team
Report

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Brooklyn, Connecticut

March 1983

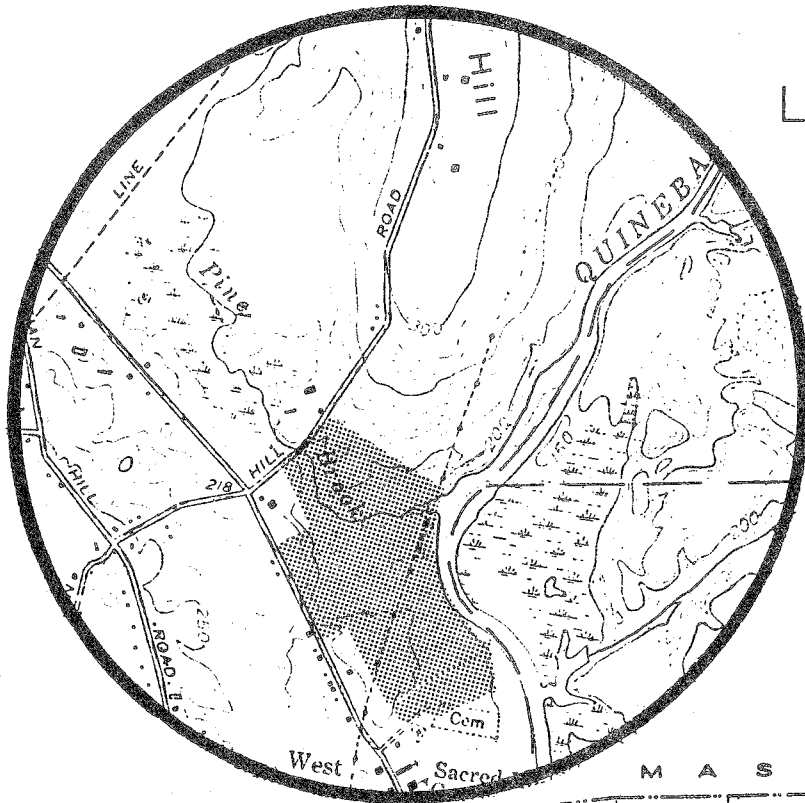


Eastern Connecticut Resource Conservation & Development Area

Environmental Review Team
PO Box 198
Brooklyn, Connecticut 06234

Location of Study Site

MERCIER GRAVEL EXCAVATION
BROOKLYN, CONNECTICUT



EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT

ENVIRONMENTAL REVIEW TEAM REPORT
ON
MERCIER GRAVEL EXCAVATION
BROOKLYN, CONNECTICUT

This report is an outgrowth of a request from the Brooklyn Planning and Zoning Commission 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 Executive Committee for their consideration and approval. The request was approved by the RC&D Executive Committee and the measure was reviewed by the Eastern Connecticut Environmental Review Team (ERT).

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

The ERT that field-checked the site consisted of the following personnel: Tim Pindell, Soil Conservationist, Soil Conservation Service (SCS); Bill Warzecha, Geologist, Connecticut Department of Environmental Protection (DEP); Dick Raymond, Forester, DEP; Maureen Peters, Regional Planner, Northeastern Connecticut Regional Planning Agency (NECRPA); Craig Ferrell, Regional Engineer, (NECRPA); and Jeanne Shelburn, ERT Coordinator, Eastern Connecticut RC&D Area.

The Team met and field checked the site on Tuesday, March 8, 1983. Reports from each contributing member were sent to the ERT Coordinator for review and summarization for the 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 developer and the Town of Brooklyn. 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.

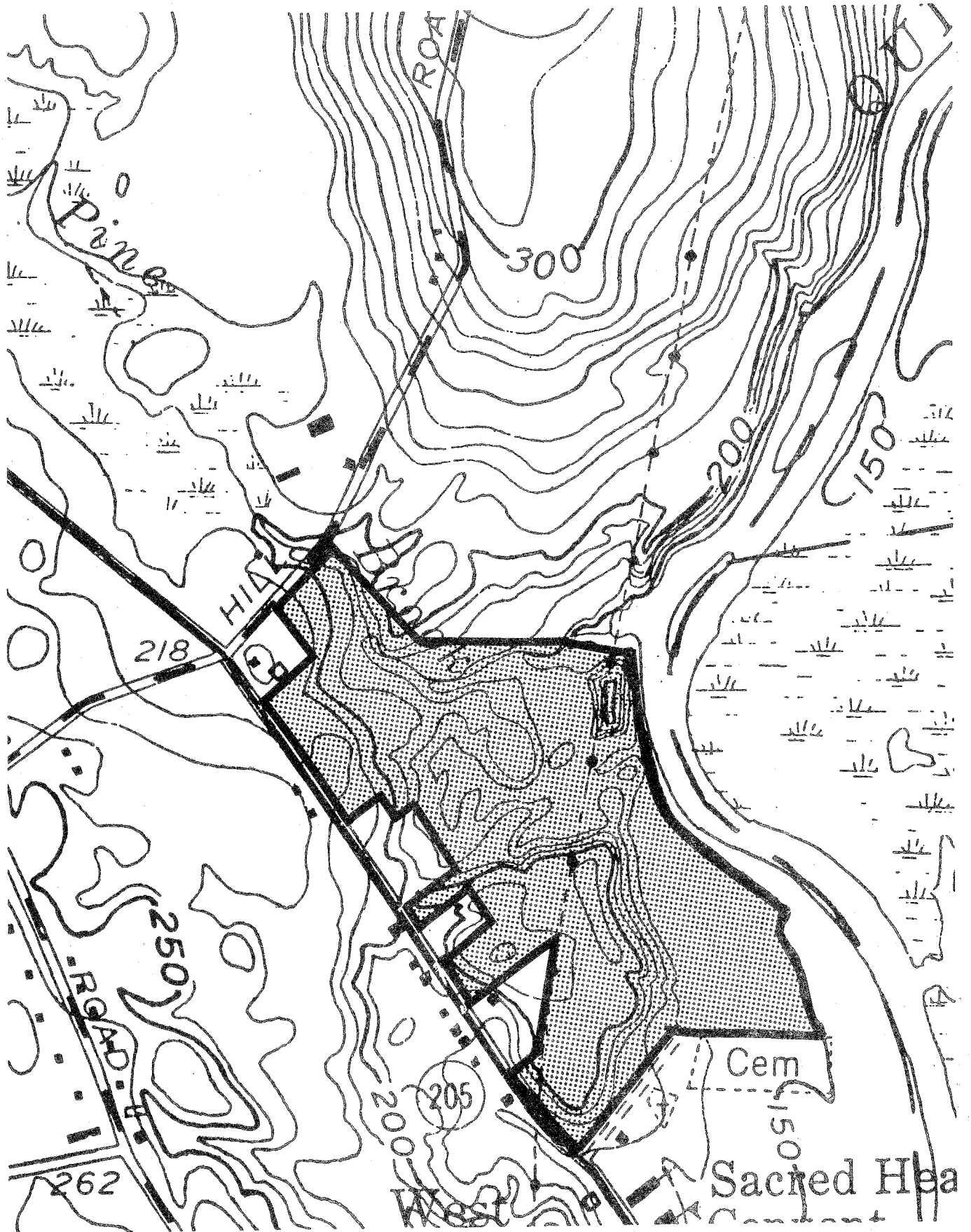
The Eastern Connecticut RC&D Area Committee hopes that this report will be of value and assistance in making any decisions regarding this particular site.

If you require any additional information, please contact: Ms. Jeanne Shelburn, Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, P.O. Box 198, Brooklyn, Connecticut, 06234, 774-1253.

Topography

— Site Boundary

0 660'
scale



INTRODUCTION

The Eastern Connecticut Environmental Review Team was asked to prepare an environmental assessment of a proposed gravel excavation in the southern section of the town of Brooklyn. The site is approximately 80 acres in size and is located on Route 205 and Allen Hill Road. The property is presently in the private ownership of William Mercier.

Engineering plans for Phase I of the mining operation had been prepared prior to the Team's field review of the site. Excavation of approximately 60,000 cubic yards of earth materials is planned for this phase. Phase I is scheduled to take two to three years to complete. Plans for Phases II, III and IV have not yet been prepared, but excavation will generally proceed to the 160 foot contour elevation. As details have not been finalized at this time, this report will deal primarily with the excavation planned for Phase I.

A portion of this site is currently being excavated for earth materials. The major portion of this property was previously used as a campground and recreation area. Sections of the site not presently under excavation, do have vegetative cover. Soils on the site are primarily well drained. The Quinebaug River forms the site's eastern boundary.

The Team is concerned with the effect of this proposed excavation on the natural resource base of this site and the surrounding area. The following sections of this report discuss the natural limitations of this site for the proposed gravel extraction operation and suggests mitigation measures which may be helpful to the developer and the Town commissions.

ENVIRONMENTAL ASSESSMENT

TOPOGRAPHY

The proposed sand and gravel mining operation, which is approximately 80 acres in size is located south of Allen Hill in the Town of Brooklyn. The site lies between Route 205 and the Quinebaug River in the West Wauregan section of town.

Elevations on the site range from a low of 150 feet above mean sea level in the eastern section (along the Quinebaug River) and rises to a high of 200 feet above mean sea level in the west central portion. These elevations were taken from the Danielson topographic quadrangle map published by the U.S. Geological Survey. (USGS) Steepest slopes (20-30%) on the site are found in the middle and southern section.

As stated by Mr. Mercier, the first phase of the mining operation will include the area between the Sacred Heart Cemetery and the utility right of way which intersects the property.

GEOLOGY

The proposed sand and gravel extraction site is located within the Plainfield topographic quadrangle. The surficial, geologic materials, those materials overlying bedrock within the site, are included in the Surficial Geologic Map of the Danielson Quadrangle, by Allan D. Randall and Fred Pessl, Jr. (1968).

The surficial deposits found throughout the property are an extensive sequence of glacial meltwater deposits that flank the Quinebaug River. These deposits are referred to as "stratified drift" which consists mainly of sand, gravel, silt with some cobbles and locally a few boulders. "Stratified drift" deposits are defined as sorted, well layered sediments that were deposited by glacial meltwater streams. Deposits in the eastern portion of the site are inferred to contain fine grained deposits underlain by coarse grain deposits where as the western portion is predominately coarse grained deposits that range in grain size from cobble-boulder gravel to silt. However, it should be noted that sand and gravel deposits in some areas have already been extracted. (Source: USGS Water Resource Bulletin No. 8, Quinebaug River Basin).

Bedrock underlying the surficial deposits throughout the entire site falls within the lower member of the Quinebaug Formation. Although no outcrops were observed on the site, these rocks, as mapped from surrounding outcrops are mapped as gneisses. "Gneiss" is a coarse grained metamorphic rock (rocks changed either in texture or in mineral composition by great heat and pressure) in which fairly wide bands, sometimes several feet in thickness alternate with narrow bands. The banding is produced by alternating light and dark layers of minerals and by the variation in grain size of minerals. Based on information reviewed from well completion reports of individual water wells in the area, depth to bedrock is probably about 40-50'.

Information regarding underlying bedrock was compiled from the Bedrock Geologic Map of the Danielson Quadrangle by H. Roberta Dixon (1966) and published by the U.S. Geological Survey. Both the surficial and bedrock geology maps are available at the Natural Resources Center, Department of Environmental Protection, Hartford, Connecticut.

SOILS

A detailed soils map of this site is included in the Appendix to this report accompanied by a chart which indicates soil limitations for various urban uses. As the soil map is an enlargement from the original 1,320 feet/inch scale to 660 feet/inch, the soil boundary lines should not be viewed as absolute boundaries, but as guidelines to the distribution of soil types on the site. The soil limitation chart indicates the probable limitations for each of the soils for on-site sewerage, buildings with basements, buildings without basements, streets and parking, and landscaping. However, limitations, even though severe, do not preclude the use of the land for development. If economics permit large expenditures for land development and the intended objective is consistent with the objectives of local and regional development, many soils and sites with difficult problems can be used. The soils map, with the publication Soil Survey, Windham County,

Connecticut, can aid in the identification and interpretation of soils and their uses on this site. Know Your Land: Natural Soil Groups for Connecticut can also give insight to the development potentials of the soils and their relationship to the surficial geology of the site.

The soils to be found within the excavation limits are: Hinckley gravelly sandy loam (HkA, HkC, HkD) and Merrimac sandy loam (MyA), MyB). Hinckley and Merrimac soils were developed from glacial outwash plains and terraces and this site overlies an important aquifer capable of yielding 50-2000 gallons per minute. Ground water contamination is a hazard with this site. These soils present a hazard during excavation with cut slopes caving-in. Revegetation is difficult due to excessive drainage. Tree seedlings have a high mortality rate. Soil pH has a range from 3.6 - 6.0. This site consists primarily of Hinckley gravelly sandy loam. The excavation limit for the proposed site is 900 feet from the Quinebaug River. Other plans were mentioned at the March 8 meeting to include a section of the Sacred Heart Church property in the excavation limits at the southwest corner in exchange for more land to the southeast. The access road is to be located adjacent to the Clarence and Dorothy Matherne property proceeding to the lower northeast point of the excavation. No plans for stockpiling topsoil or revegetating the site have been submitted at this time.

The underlying gravel will keep sedimentation on the site at a minimum. Staked hay bales or filter fabric placed at the 160 contour elevation along the lower excavation limit will be sufficient to contain sediment for this phase of the operation. The access road will tend to erode behind the Matherne and Furlong properties. Sediment will deposit in the open area near the concrete block building. Hay bales or filter fabric should be placed below the road at some point. Stockpiling and temporary seeding of topsoil should be done.

When the Team was at the site, there were numerous vertical cut slopes at the existing operation. For the safety of the community it is recommended after each day these vertical cuts be shaped to avoid the hazard of caving-in.

Due to the hazard of ground water pollution, extreme care should be taken to avoid spills of gasoline, soil, hydraulic fluid or any other material that would degrade the water supply.

The grading of the proposed site is acceptable within the specified boundaries. Vegetative renovation is considered essential treatment to retain quality in the resource base. As soon as is practical, topsoil should be replaced and the site seeded preferably between April 1 - June 15.

The 30% cutslopes would best be stabilized by seeding 16 lbs. Crownvetch with 23 lbs. KY 31 Tall fescue per acre. Lime and fertilize according to soil test or apply 4,000 lbs. lime/acre and 400 lbs. 10-10-10 per acre. On the flat grade (0-5%) a mixture of 25 lbs. Tall fescue with 25 lbs. red fescue is recommended. Lime and fertilize same as above.

To provide an additional sound buffer, it might be practical to relocate the access road midway between the Matherne and Major properties. This would be a benefit to the Mathernes. Some cutting into the hill would need to be done.

ENGINEERING CONCERNS

Data supplied verbally by the applicant with regard to borings made at the site indicate that the ground water table will not be encroached upon by the proposed excavation. The gravel removal plan requires that a nine-plus acre area will be stripped of vegetation and topsoil and, because future plans are to extend the removal operations both lower and to the west of the final grades indicated, most of this area will not be restored upon completion of this "phase".

The proposed 0.5% bottom grade will be difficult to construct without creating storm water collecting depressions if for some reason restoration is undertaken at this level. If the bottom does remain as unrestored gravel for extraction operations to continue in a new "phase", then water collection will not be a problem.

Proposed access to Route 205 is good in terms of drainage, sight lines and road capacity. Precautions should be taken for dust control especially in the vicinity of the abutting residences and the public road.

VEGETATION

The portion of the tract designated for Phase I of the gravel excavation project may be divided into two major vegetation types. These include 5 $\frac{1}{2}$ acres of softwoods and 7 $\frac{1}{2}$ acres of softwoods/hardwoods. An active gravel bank occupies an additional 6 $\frac{1}{2}$ acres.

Vegetation Type Descriptions

Type A. (Softwoods) This 5 $\frac{1}{2}$ acre fully stocked white pine stand consists of medium to high quality pole to sawtimber-sized trees. Hardwood and white pine seedlings form the understory. Ground cover is composed of various mosses and ferns.

Type B. (Softwoods/Hardwoods) A variably stocked stand of 7 $\frac{1}{2}$ acres, this stand has been commercially clearcut. The pine and hardwood sawtimber, together with the hardwood fuelwood have been removed in preparation of expanding the gravel bank. The remaining overstory is pole-size white pine. The understory is white pine and hardwood seedlings while blueberry, huckleberry and ferns comprise the ground cover.

The proposed utilization of the property for gravel excavation will impact the vegetative cover negatively, dependent upon the extent of clearing. The extent of vegetation losses will depend upon the magnitude of the development. Removal of all woody vegetation from the excavation areas and access roads will be necessary.

Mitigating Measures/Management Practices

The trees which are removed during clearing operations should be utilized for sawtimber, fuelwood and woodchips. Areas to be cleared should be well defined and clearly marked so as to prevent unnecessary and unwanted clearing.

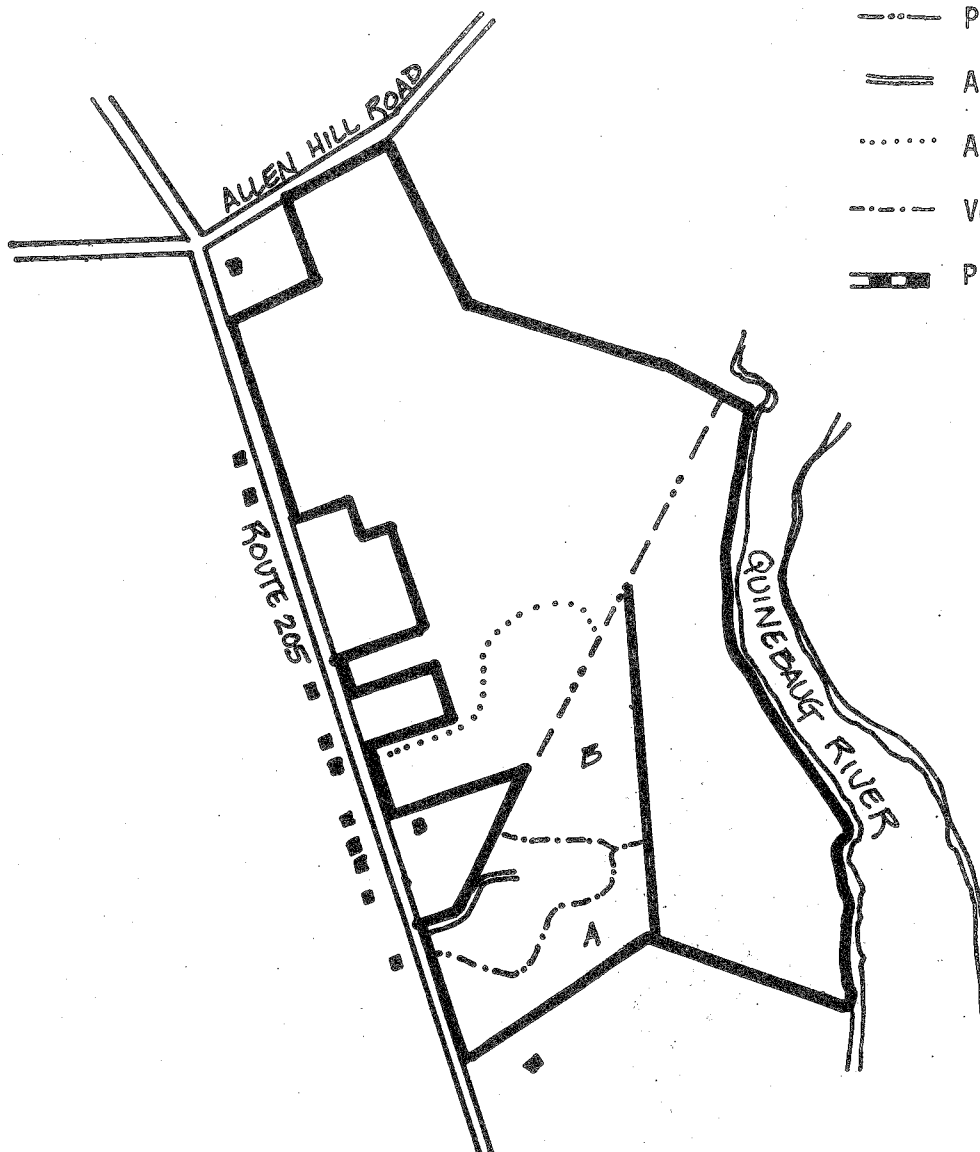
Vegetation

0 660
scale



LEGEND

- Powerline R.O.W.
- == Access Road (present)
- Access Road (proposed)
- .-.- Vegetation Type Boundary
- ▬ Phase I-- limit of excavation



VEGETATION TYPE DESCRIPTIONS*

TYPE A. Softwoods, 5+ acres, fully stocked, pole to sawtimber size.

TYPE B. Softwoods/Hardwoods, 7+ acres, variably stocked, seedling to pole size.

Seedling Size: Trees less than 1" diameter at 4½' above the ground. (D.B.H.)

Sapling Size: Trees 1" to 5" DBH.

Pole Size: Trees 5" to 11" DBH.

Sawtimber Size: Trees 11" DBH and greater.

While Mr. Mercier is unsure of the use of the property after the gravel is excavated, he stated that he intended to keep his options open. The possibility of a residential development or a light industrial/commercial park arose. With this in mind, the excavation area should be stabilized with a ground cover such as grass. Trees and shrubs should be planted only on areas that would not be subject to future disturbance.

Areas should be stabilized by planting as soon as possible after excavation is completed. In addition to soil stabilization, the plantings also will provide food and cover for wildlife.

Suitable ground covers include:

- Crownvetch
- Flatpea
- Tall Fescue
- Perennial ryegrass

Suitable shrub species include:

- Autumn Olive
- Silky Dogwood
- Highbush Blueberry

Suitable tree species include:

- Eastern Red Cedar
- Eastern White Pine
- European Black Alder
- Crab Apple
- Flowering Dogwood

Many of the tree and shrub species are available through the Department of Environmental Protection's Pachaug State Forest Tree Nursery. Public service foresters provide on-site planting advice without charge upon request.

WATER RESOURCES

The site, which lies within the Quinebaug River Basin is bound on the east by the Quinebaug River and to the north by Pine Brook. Due to the highly permeable nature of the stratified sand and gravel deposits throughout the site, most rainfall is absorbed into the ground rather than passing overland via a water-course. Ground water flow underneath the site is directed primarily eastward towards the Quinebaug River.

The entire site lies within an area which is classified as a potential stratified drift aquifer zone. These saturated sands and gravels are inferred to be capable of yielding moderate to very large amounts of water (50-2,000 gallons per minute) for individual wells.

However, in reviewing several well completion reports of residential wells in close proximity to the site, bedrock wells have been installed, as opposed to tapping the productive stratified drift aquifer. Yield of these wells ranged between five and thirty gallons at varying depths into bedrock (52-300'). Should the proposed operation require the need for a water supply it would seem likely that by tapping the shallower, stratified drift aquifer it would probably be less

costly and provide a larger yield of water than the bedrock well. The quality of ground water from either type well should be satisfactory. If a well is installed on the property it should be located at a relatively high point far removed from any potential pollution source i.e., on-site sewage systems, fuel storage tanks, etc.

As stated by Mr. Mercier during the review, the mining operation will not interfere with the ground water table based on borings conducted on the site. Nevertheless, it is recommended that the property owner supply the town with a detailed plan depicting how the Quinebaug River and Pine Brook will be protected from possible erosion and sedimentation problems created by the mining operation. Erosion and sedimentation mitigation measures may include the following; (1) maintaining a buffer zone of vegetation between mined areas and the watercourses mentioned above (2) providing vegetative cover over extracted areas as soon as possible, especially in sloped areas (3) keeping disturbed areas small (4) stabilizing and protecting disturbed areas during extraction operations.

The Windham County Soil and Water Conservation District will provide technical assistance in preparing a Sediment and Erosion Control plan for this operation, if necessary.

PLANNING CONCERNS

The Mercier property has an extensive stock of soils suitable for excavation in a gravel mining operation. The soils on the site are all rated probable or good for construction materials (for sand or gravel or roadfill). The site should yield significant amounts of marketable materials.

The plan for excavation of the property calls for removal in phases, of which only the first was presented in the plans or is addressed in this review. Plans for excavation of the additional phases must be prepared and submitted to the town before approval would be granted for subsequent phases of operation.

The plans for the first phase call for excavating the portion of the parcel adjacent to the Sacred Heart Church property. The excavated area would drop off at a slope of approximately 30% from the plans or is addressed in this review. Plans for excavation of the additional phases must be prepared and submitted to the town before approval would be granted for subsequent phases of operation. The proposed final grade of the pit area is 0.5% slope. The plans for excavation allow for a buffer strip between the mining area and the church property, and the mining area and the Quinebaug River. The proposed plans seem to be in accordance with town regulations and would be acceptable from a planning viewpoint provided certain concerns are adequately addressed.

The excavated area should be revegetated and restored as soon as possible after the work in that area is completed. A cover crop should be placed on the exposed soils promptly after excavation to minimize erosion loss and problems of sedimentation on the site boundary that is adjacent to the Quinebaug River.

Since the site is located within the immediate area of a number of private homes, care should be taken to keep the site aesthetically pleasing as seen from the road and from these homes. Maintaining some of the existing trees between the road and the gravel pit would enhance the compatibility of the operation with the surrounding neighborhood.

TRAFFIC CONCERNS

Route 205, though a State road, is a rural highway with homes located on it. Safety of the residents in the neighborhood (particularly children) with the additional traffic volume from the proposed operation is a primary concern which must be considered. Additional concerns of noise and pollution from the trucks and deterioration of the road itself must also be addressed.

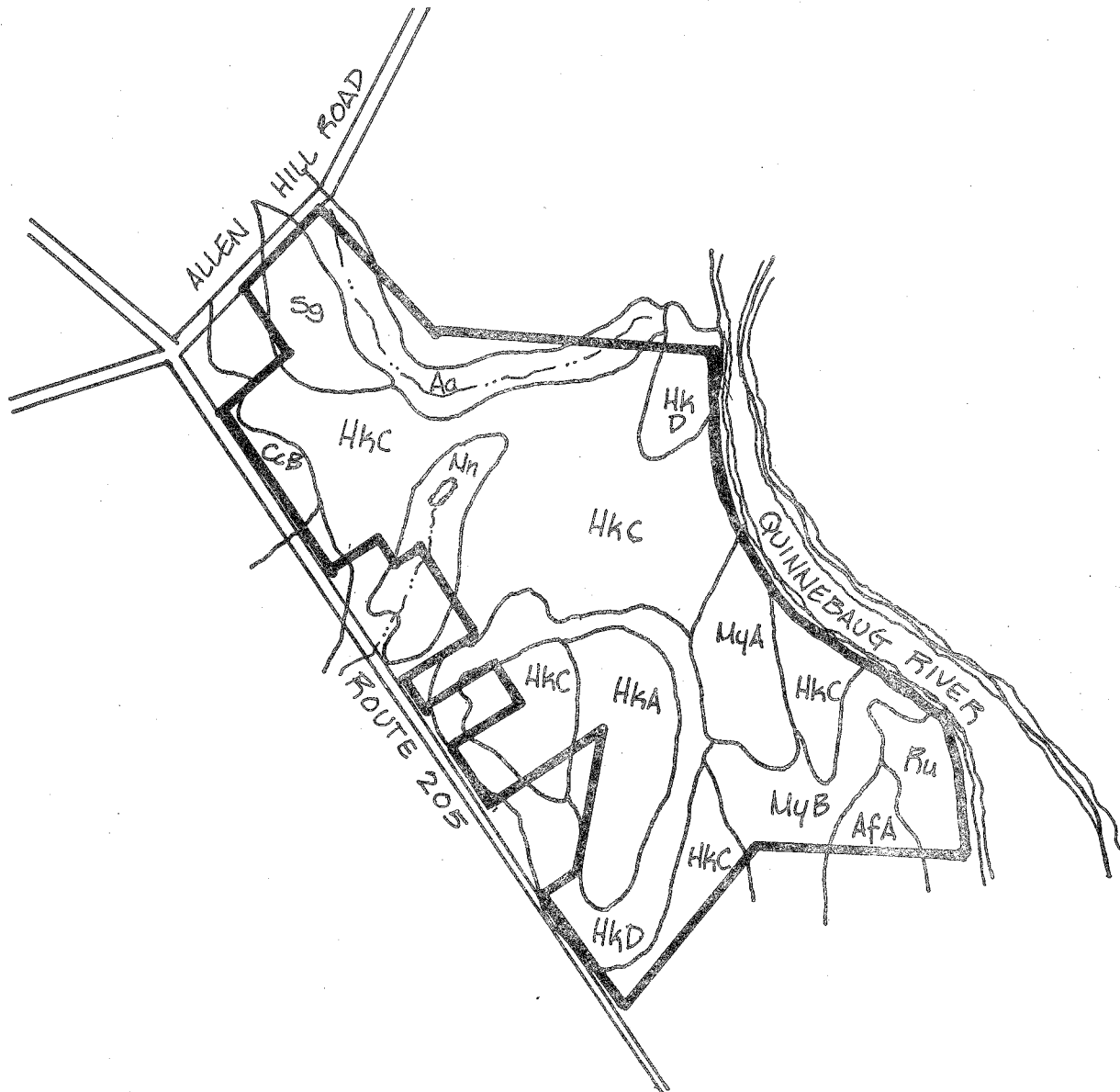
The proposed access road from the gravel excavation operation is designed with ease of access and safety considerations in mind. The proposed driveway was designed to utilize an access with the best sight lines onto Route 205. This proposed access should minimize the danger posed by trucks entering and leaving the site but some safety problems still exist. Trucks entering onto Route 205 will be coming out slowly and will pull into traffic where the cars are travelling at speeds over 40 mph which could pose safety hazards. The large turning radius necessary for these big trucks could be dangerous to other traffic on the road near the entrance. The size of the trucks may cause problems of visibility for other traffic on the road and with oncoming traffic, particularly in the narrower sections of the road and at curves.

No daily estimates of gravel removal were available for the review though an estimated 60,000 cubic yards is expected to be removed in the first phase of operation. The gravel will be hauled from the site in 10 wheeler trucks each of which weigh up to 20 tons. The impact that this weight would have on the road surface and the stress that several heavy truck trips per hour would place on the road would be significant. The necessary road maintenance and repair costs incurred as a result of the additional volume of truck traffic could be extensive.

Appendix

Soils

0 660'
scale



MERCIER PROPERTY
BROOKLYN, CONNECTICUT

PROPORTIONAL EXTENT OF SOILS AND THEIR LIMITATIONS FOR CERTAIN LAND USES

SOIL SERIES	SOIL SYMBOL	PRINCIPAL LIMITING FACTOR	URBAN USE LIMITATIONS			
			ON-SITE SEWAGE	BUILDINGS with BASEMENTS	GRAVEL SOURCE	TOPSOIL SOURCE
Adrian-Palms	Aa	flooding	3	3	probable	poor
Agawam	AfA	wetness low strength	1	1	probable	poor
Canton-Charlton	CcB		1	1	improbable	good
Hinckley	HkA	large stones	2	3	probable	good
Hinckley	HkC	slope, poor filter	2	3	probable	good
Hinckley	HkD	slope, poor filter	3	3	probable	fair
#Merrimac	MyA	poor filter	1	3	probable	good
#Merrimac	MyB	poor filter	1	3	probable	good
#Ninigret	Nn	wetness	3	3	probable	fair
*Rippowam	Ru	wetness	3	3	improbable	poor

*Wetlands as designated by PA 155.

#Prime Farmlands.

Limitations: 1 = slight; 2 = Moderate; 3 = Severe

SOIL INTERPRETATIONS FOR URBAN USES

The ratings of the soils for elements of community and recreational development uses consist of three degrees of "limitations:" slight or no limitations; moderate limitations; and severe limitations. In the interpretive scheme various physical properties are weighed before judging their relative severity of limitations.

The user is cautioned that the suitability ratings, degree of limitations and other interpretations are based on the typical soil in each mapping unit. At any given point the actual conditions may differ from the information presented here because of the inclusion of other soils which were impractical to map separately at the scale of mapping used. On-site investigations are suggested where the proposed soil use involves heavy loads, deep excavations, or high cost. Limitations, even though severe, do not always preclude the use of land for development. If economics permit greater expenditures for land development and the intended land use is consistent with the objectives of local or regional development, many soils and sites with difficult problems can be used.

Slight Limitations

Areas rated as slight have relatively few limitations in terms of soil suitability for a particular use. The degree of suitability is such that a minimum of time or cost would be needed to overcome relatively minor soil limitations.

Moderate Limitations

In areas rated moderate, it is relatively more difficult and more costly to correct the natural limitations of the soil for certain uses than for soils rated as having slight limitations.

Severe Limitations

Areas designated as having severe limitations would require more extensive and more costly measures than soils rated with moderate limitations in order to overcome natural soil limitations. The soil may have more than one limiting characteristic causing it to be rated severe.

About the Team

The Eastern Connecticut Environmental Review Team (ERT) is a group of professionals in environmental fields drawn together from a variety of federal, state, and regional agencies. Specialists on the Team include geologists, biologists, foresters, climatologists, soil scientists, landscape architects, archeologists, recreation specialists, engineers and planners. The ERT operates with state funding under the supervision of the Eastern Connecticut Resource Conservation and Development (RC&D) Area.

The Team is available as a public service at no cost to Connecticut towns.

PURPOSE OF THE TEAM

The Environmental Review Team is available to help towns and developers in the review of sites proposed for major land use activities. To date, the ERT has been involved in reviewing a wide range of projects including subdivisions, sanitary landfills, commercial and industrial developments, sand and gravel operations, elderly housing, recreation/open space projects, watershed studies and resource inventories.

Reviews are conducted in the interest of providing information and analysis that will assist towns and developers in environmentally sound decision-making. This is done through identifying the natural resource base of the project site and highlighting opportunities and limitations for the proposed land use.

REQUESTING A REVIEW

Environmental reviews may be requested by the chief elected officials of a municipality or the chairman of town commissions such as planning and zoning, conservation, inland wetlands, parks and recreation or economic development. Requests should be directed to the Chairman of your local Soil and Water Conservation District. This request letter should include a summary of the proposed project, a location map of the project site, written permission from the landowner allowing the Team to enter the property for purposes of review, and a statement identifying the specific areas of concern the Team should address. When this request is approved by the local Soil and Water Conservation District and the Eastern Connecticut RC&D Executive Council, the Team will undertake the review on a priority basis.

For additional information regarding the Environmental Review Team, please contact Jeanne Shelburn (774-1253), Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, P.O. Box 198, Brooklyn, Connecticut 06234.