ENVIRONMENTAL REVIEW TEAM REPORT
ON
SALMON PROPERTY
BROOKLYN, CONNECTICUT
MAY, 1976

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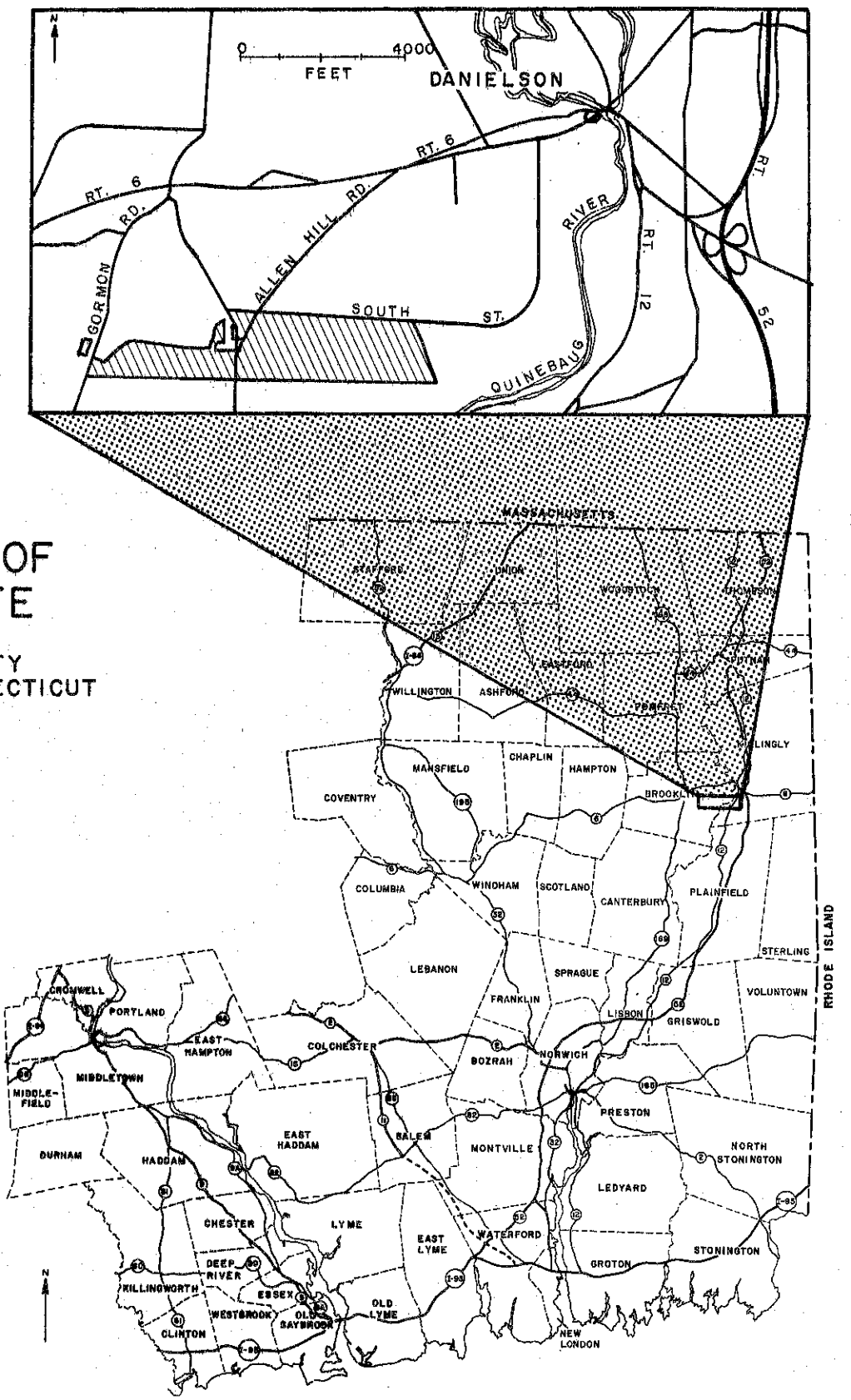
EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT PROJECT
Environmental Review Team
139 Boswell Avenue
Norwich, Connecticut 06360

LOCATION OF STUDY SITE

SALMON PROPERTY
BROOKLYN, CONNECTICUT



EASTERN CONNECTICUT
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT

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ON
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This report is an outgrowth of a request from the Brooklyn First Selectman, with the permission of the landowner, 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) Project Executive 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 of the site were forwarded to all ERT participants prior to their field review of the site.

The ERT that field-checked the property consisted of the following personnel: Al Weeks, District Conservationist, SCS; Tim Dodge, Wildlife Biologist, SCS; Dan Meade, Geologist, Connecticut Department of Environmental Protection (DEP); George Cloutier, Forester, DEP; Dave Miller, Climatologist, University of Connecticut Extension Service; Malcolm Shute, Sanitarian, Connecticut Department of Health; Linda Simkanin, ERT Coordinator, Eastern Connecticut RC&D Project.

The Team met and field-reviewed the site on Thursday, March 4, 1976. Reports from each Team 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 Project 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 Project, 139 Boswell Avenue, Norwich, Connecticut 06360, 889-2324.

INTRODUCTION

Mr. and Mrs. Clarence Salmon, owners of 240 acres of land located south of South Street and straddling Allen Hill Road in the Town of Brooklyn, are contemplating both industrial and residential development at the site. Residential single family housing is proposed for that portion of the site west of Allen Hill Road, an industrial park is proposed east of Allen Hill Road in the gravel pit area indicated on the topography map further in this report, and an apartment complex is proposed for the extreme easterly portion of the property.

The Environmental Review Team field-reviewed the site relative to these general proposals. The site is presently undeveloped and is zoned partly for industrial use, and partly for residential/agricultural use. At present, water retrieval and sewage disposal would have to be developed on-site. Public sewers could possibly be extended from Danielson to at least serve the northeast corner of the site for which the apartment complex is proposed. Public water too, could possibly be extended from the Fortin Drive area in Danielson in order to serve the apartment complex and possibly the industrial park, but preliminary discussions with the Eastern Connecticut Development Council and the Crystal Water Company (now serving Danielson) indicate that extension of the water line would be extremely expensive.

Some aspects of the proposed development discussed by the Team involve sewage disposal and water supply, and the question of access to the industrial park and the adequacy of existing roads in the vicinity.

This report will also describe the natural characteristics of the site including topography, geology, soils, forest cover, and wildlife habitat. Consideration will be given to the compatibility and suitability of the development relative to the natural resource base. Comments or recommendations made within the report are presented for consideration by the developer and the town in the preparation and review of the development plans, and should not be construed as mandatory or regulatory in nature.

EVALUATION

TOPOGRAPHY AND GEOLOGY

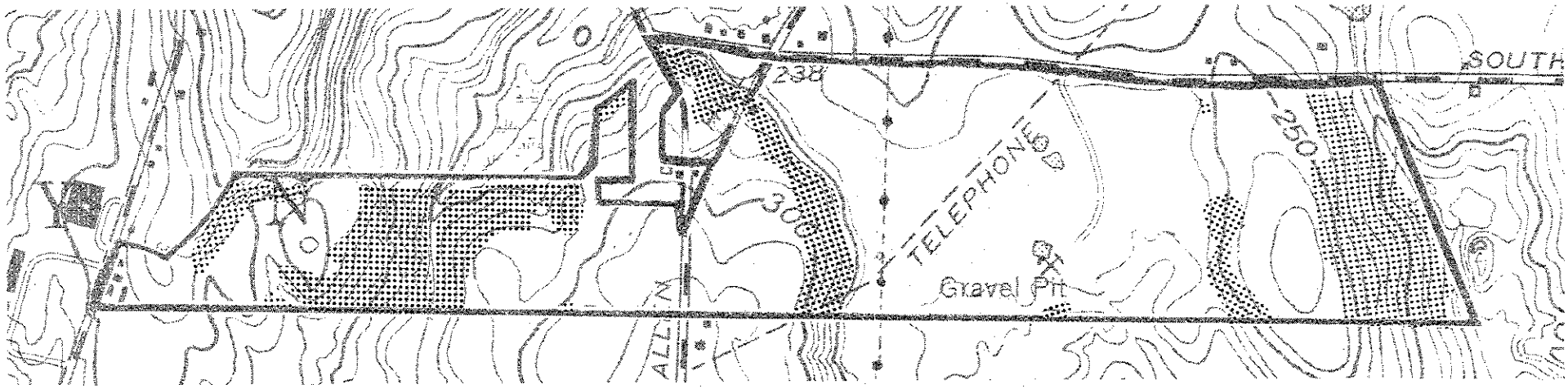
The site of the proposed development in Brooklyn, Connecticut lies wholly within the Quinebaug River drainage basin. The site is underlain everywhere by crystalline bedrock which is discontinuously covered by unconsolidated glacial and glacio-fluvial sediments. The site is topographically, geologically and hydrologically variable and typical of the eastern upland section of the state. Because of the variability the site may lend itself to a variety of land uses.

Topographically the site can be divided into three sections; a flat terrace standing at an elevation of 235 feet above mean sea level, in the center bounded by more rugged and hilly land on either side. The site of sand and gravel mining, the terrace has a distinct lack of slope with grades ranging from near 0% upward to about 5% on the north and south borders of the site. The western half of the site is characterized by hill and valley terrain where an excess of land area slopes between 5% and 10% and greater than 10%. The only significantly large area of land with slopes of less than 5% occurs along the ridgeline on Allen Street. The eastern one quarter of the site is similar to the western one half with much of the land sloping in excess of 5% and 10%. (See slope map on the following page). Slopes in the eastern quarter, however, are much more continuous and symmetrical around the north-south trending hill which is probably a drumlin. Topographically, the terrace is best suited to construction type land uses such as industrial-business or residential. The hillier western and eastern sections suited for either residential or recreational-open space use.

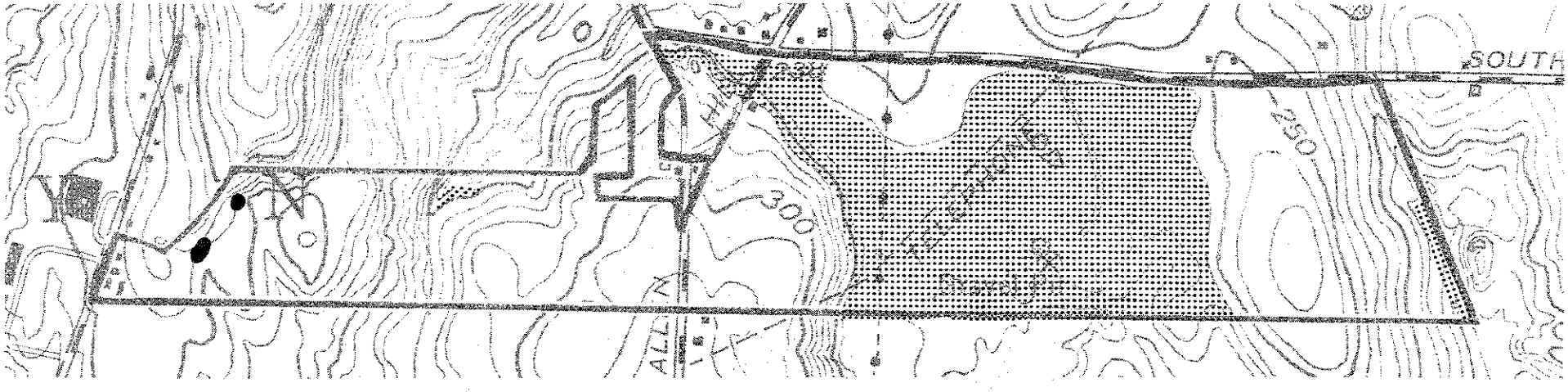
Bedrock underlying the site is composed of metavolcanic and metasedimentary crystalline rocks of the Quinebaug Formation. The eastern 3/4 of the site is underlain by the lower member of the Quinebaug and consists generally of quartz, plagioclase feldspar and mica minerals. The rocks are classified as gneisses. The western 1/4 of the site is underlain by the Black Hill member of the Quinebaug which is a well layered schist high in quartz, plagioclase feldspars and micas. Outcroppings of bedrock occur only in the far western part of the site and are surrounded by only a small area of land which is considered to be less than 10 feet of surficial material overlying bedrock. Limitations on land use due to prevailing bedrock conditions would be confined only to that area unless further on site investigation alters the extent of that unit.

Surficial materials found overlying bedrock on the site consist of two major deposits, till and stratified sands and gravels. As shown on the materials distribution map on the following page, the stratified material is confined to the terrace area and surrounded on east and west by till in the hillier regions. The till characterized by its nonsorted makeup of clays, silts, sands, gravels and boulders is generally typified by its low values of permeabilities allowing for only slow transmission of ground water. The stratified material, composed of coarse grained sediments at least on the surface should have high values of permeability. The presence of a high ground water table in parts of the terrace, however, may be an indicator of a fine grained stratified drift body underlying the cobble gravels exposed at the surface. This gravel cap type of geology is very common to Connecticut. The materials, themselves, other than their abilities to transmit water, offer little to discourage land use proposals.

TOPOGRAPHY MAPS



SLOPE GREATER THAN 10%



DISTRIBUTION OF UNCONSOLIDATED MATERIALS

TILL

STRATIFIED DRIFT

BEDROCK OUTCROPS

0 1000
FEET

Ground water seems to be close to land surface at many locations in the site area. This would simply be a function of the low values of permeability of the surficial materials. Inability to transmit water would result in poor subsurface drainage of water or effluent in these areas.

The development of an on-site water supply would necessarily be confined to bedrock wells of rather low yields (probably sufficient for modern domestic use) in most of the site. A possibility for a gravel packed well does exist in the southern part of the terrace region but the small saturated thickness of sand and gravel would probably limit yields to only moderate amounts. Confirmation of the potential of this type of well would necessitate test borings to determine the type and extent of coarse grained stratified drift.

Overall the terrace area seems well suited to business or industrial type of construction as well as residential development. The hillier eastern and western sections seem best suited for either low density residential growth, dependant upon location of suitable disposal areas, or recreational-open space uses in locals of high water table, high slope or shallow to rock conditions.

SOILS

A detailed soil map of the site is given in the Appendix of this report. The map is given at a scale of 1000'/inch; 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 soil map, and the accompanying chart indicating soils limitations for various land uses (also found in the Appendix), indicate that portions of this land is well-suited to the production of woodland as well as agricultural crops. Better than half of the openland and some of the woodland soils are class II soils; this classification indicates they are prime agricultural lands.

A large area where the gravel pit is located has no topsoil available to establish vegetation. Topsoil will have to be moved to areas where lawns and other vegetative cover is planned. On the west side of Allen Hill Road for a distance of about 1700 feet, 34% of the soils would be poorly and very poorly drained soils. Other than the cropland field adjacent to Allen Hill Road, the best use of the area would be wildlife land. Soils mapped Paxton (35) and Woodbridge (31) normally have a fragipan located at a depth of about 24 inches. Regrading areas containing only a few inches to the fragipan will be easily saturated during wet periods. In areas mapped Charlton-Hollis where single and multi-family housing is planned with basements, exact locations of buildings should be made after the testholes are dug and approved.

FOUNDATION DEVELOPMENT AND GRADED CONDITIONS

Substratum support - Under normal conditions it appears that the bearing capacity for loads associated with normal building construction will be adequate.

Drainage - Areas containing the fragipan will need extensive drainage around footings, roads, driveways, banks and lawns to minimize seepage, sluffing and winter icing. Plan a system of diversions and waterways to adequately handle

runoff water to a safe outlet. Plans to adequately handle storm water and drainage water should be developed before the start of any construction. Final grades should have no banks greater than one (1) vertical to three (3) horizontal. Banks steeper would be difficult to mow and maintain. Lack of topsoil in the gravel pit area of the development will increase the already droughtly conditions of this area. Irrigation may be needed to establish and maintain the vegetation planned for the area. Adequate drainage should be planned in area of the present gravel pit that is now at or close to watertable.

Plans before construction should show how erosion and sedimentation will be kept at a minimum. Two U.S. Soil Conservation Service publications, "Urban Hydrology for Small Watersheds" and "Erosion and Sediment Control Handbook" are available to assist with planning of the land surface and natural cover.

FOREST COVER

Of the approximate 240 acres reviewed, about 150 acres are in woodland which is a mix of hardwoods and conifers. White pine is the dominant conifer while oaks and maples are the dominant hardwoods. A small gravel mining area is present which encompasses about 20 acres. The remaining 70 acres are open land composed of small fields bounded by brushy and tree lined walls. These open areas are devoted to agricultural operations which include approximately 30 acres in grasses and legumes, primarily alfalfa, and 40 acres used for growing silage corn. In addition there is a CL&P right of way which crosses the property; high tension wires are present in this area.

Mixed hardwood and pine softwood stands on the site should be harvested before conversion to other land uses. This will help in conserving energy use and would lower development costs. Operators need up to six months lead time for planning and executing operations. Forest stands present on site are capable of being managed to provide a pleasing and stimulating landscape for any future development. Future maintenance costs could be realized if large enough buffer strips and stands are left to make commercial management feasible. A minimum of 200 foot buffer strips can be maintained for production of forest products while the stand provides all the pleasing landscape amenities. Cordwood cuttings would be needed to release the excellent young pine understory on some of the area. Careful selection of trees in the pine saw timber area would improve the health and vigor of residual trees during any cutting operations.

Forest management and marketing information is available from the Department of Environmental Protection Foresters and Consulting Foresters. A list of personnel is available from Regional and County Extension Offices.

It is important to recognize the forested landscape as a critical ingredient in the quality of living, especially in the last remaining green belt that is part of the growing megalopolis. Careful planning for development should include using the natural native forest resource to its best advantage for vistas on high ground, sound and sight buffer zones along or near avenues of travel and living space, and recognizing the benefits derived from ameliorating climatic conditions such as wind screening to reduce heat loss from convection in winter and thermal cooling in summer.

CLIMATOLOGY

There are no severe climatic limitations to development of the site for industrial purposes. Although prevailing summer wind directions are from the southwest and any air pollutants generated at the site would be carried across the city of Danielson during the six warm months of the year. The surrounding topography is gentle enough so dispersion of pollutants will be as rapid as the general synoptic conditions will allow.

The radiational energy load will be greatest on the top flat of Allen Hill and the level bottom area. Therefore these sites are best suited to development in terms of conserving heating energy. For this reason no development should go on the northeast facing slope of Allen Hill.

The wind exposure of the site, due to the gentle topography, is high. Therefore windbreaks of continuous coniferous tree plantings in a SW to NE direction along the north edge of the industrial site area and the NW crest of Allen Hill (to protect the housing area) will reduce the winter heating demand and make the site considerably more comfortable.

WILDLIFE HABITAT

The site has an east/west orientation, with most of the land having a gentle, rolling topography. Pine Brook borders the eastern boundary, and drains directly into the Quinebaug River, approximately 1,000 ft. downstream, while the headwaters to Long Brook drain through the western portion of the site. The site is effectively cut in half by Allen Hill Road, partially bordered on the north by South Street and bordered on the west by Gorman Road. The variety and intermixing of vegetation provided by this land use pattern provides wildlife habitat to a variety of both game and nongame species of wildlife.

At the present time, an open space proposal exists to set aside land adjacent to the Quinebaug River as a natural corrider. Development should not be planned in this area. It appears that development of the Salmon Property would not encroach upon this potential open space area. The southeast corner of the Salmon Property would be adjacent to the open space area.

There is now a highly desirable land use pattern which provides wildlife habitat to both woodland and openland wildlife species. Diversity of vegetation is high and the intermixing of fields and woods gives considerable "edge". Food and cover is available to a variety of animals including but not limited to songbirds, birds of prey, whitetail deer, raccoon, ruffed grouse, woodchuck, fox, skunk, squirrels, cottontail rabbit, and mice. Areas of high value include the powerline edge, field and woodland borders, and brushy areas with numerous weeds, fruiting shrubs and vines.

Development of the site will result in a loss of wildlife habitat somewhat proportional to the degree of development. Landscaping house lots with trees, shrubs and vines will replace habitat for some songbirds and small mammals, but the overall result of development is a lower quantity and quality wildlife habitat.

AESTHETICS AND PRESERVATION

The white pine stands now present adjacent to the gravel pit area should be preserved and improved as directed by the DEP Service Forester. Present stands may be managed to produce a high quality buffer strip for screening and providing a pleasing landscape. Wide buffer strips can be managed to provide income for future site maintenance. Bank areas especially in the droughty areas adjacent to the gravel pit area could be seeded with tall fescue and crownvetch. The crownvetch is an attractive legume with the stems high in moisture during the fall and spring periods. Because the dead material present after the growing season is not a fire hazard, the legume is adapted to areas adjacent to buildings and road banks where a minimum of maintenance is desired.

HAZARDS

The CL&P power line and the telephone line should be taken into consideration when planning the industrial area. In terms of the residential uses proposed, the power line could have an adverse effect on radio and television reception. If excavation is continued in the gravel operation, steep banks could become a hazard to children. Resloping and vegetating slopes with perennial grasses or legumes would reduce potential problems.

SERVICES TO SUPPORT DEVELOPMENT

Sufficient town services appear to exist in nearby Danielson to support the proposed residential development. In terms of a market area to need and to locate businesses in the proposed industrial park, although competition will be provided from the Killingly and the Plainfield Industrial Parks, it is generally felt by the Eastern Connecticut Development Council that with the completion of proposed Interstate Route 84 (I-84), there may be a need for additional industrial space in the Northwestern Connecticut Region.

ROADS AND UTILITIES

At present I-84 is planned to cross north of Wauregan at the junction of Allen Hill Road and Connecticut Route 205. Although the Connecticut Department of Transportation has not yet designated Allen Hill Road as a major collector for I-84, Allen Hill Road (heading south) would appear to be the logical local route should an interchange be built in that vicinity. Allen Hill Road would appear to need considerable widening and improvement if the I-84 is built. Costs for this local road improvement would undoubtedly be high and would probably be borne by the local taxpayers. Adequacy of other local roads to Route 6 should be fully investigated.

Existing roads to Exit 91 from Connecticut Route 52 south of Danielson would also have to be improved as increased truck traffic from that Route through Danielson to the proposed industrial park will be heavy.

WATER SUPPLY

At present, the private Crystal Water Company has water lines within 2000' of the site. Public water could be extended to the site if the water main were extended along Ventura Drive and South Street. The amount of water needed will depend largely on the apartment density planned, and the kinds of uses that establish themselves in the industrial park. Industries that require large amounts of water should review needs with the water company to insure an adequate supply. The water company should work closely with the industrial park as it is developed.

It may be feasible to provide on-site wells depending on lot size, location and potential contamination from industrial use. If a watermain was installed in the area, this supply should be utilized rather than individual well water supplies. However, if the homes are sufficiently removed from the public water service area, and are on adequately sized lots, a sufficient water supply could come from on-site wells due to the near vicinity of a high priority groundwater aquifer. In an effort to minimize groundwater contamination, population density should be kept low. Residential units should be provided with sufficient suitable land to allow one acre for each 200 gallons of sewage output (a minimum of 1.5 acreage or more depending on soil conditions). A similar figure would hold true for commercial enterprise. Also of great concern would be types of possible discharges, spills, leaks, residuals from motor vehicles, salting for snow and ice, increased traffic and use patterns especially industries, or highly populated areas. The type of industries should be limited to non-discharging forms and such that will minimize any contamination to the groundwater either from the business itself or indirectly as a result of motor vehicles, road salting, etc.

A strip of undisturbed land should be maintained adjacent to Long and Pine Brooks to protect water quality. During site development other conservation measures such as sediment basins and temporary seedings should be used to reduce the hazard of erosion and ensure maintenance of water quality. These measures are especially important on Pine Brook which enters the Quinebaug River approximately 1,000 feet downstream from the site.

WASTE DISPOSAL

Public sewers may be available to the northeast corner of the site. The municipal sewer plan for East Brooklyn area proposes that the sewer lines be extended to this point. The sewers would then be capable of serving the eastern sloped portion of the site where the apartment complex is proposed. It appears that due to terrain elevations and slope in this area, the sewers would not serve the proposed industrial area or the proposed single-family home portions of the site without a pumping station. The anticipated quantity and quality of the waste emitted from each proposed industry should be reviewed to insure that adequate treatment is available through the municipal waste disposal system.

At the time of the ERT field trip, standing water was observed in portions of the gravel pit area to serve as the industrial location. If this is any indication of the groundwater levels, it may not be feasible to provide subsurface sewage disposal systems in this location. The land on the east side of Allen Hill Road may be underlain with hardpan at 40 inches and may have problems with ledge.

A rock outcropping was noted. The area on the west side of Allen Hill Road may similarly be underlain with hardpan and becomes increasingly wet as the land progresses downhill towards Long Brook. Areas on either side of Allen Hill might be suitable for on-site sewage disposal, but deep observation pits should be provided for further comment. Due to possible ledge or hardpan soils with seasonal high groundwater conditions large lot sizes may be needed if subsurface sewage disposal systems can be installed. If seasonal high groundwater is exceptionally high, it may be necessary to have a professional engineer design the sewage disposal systems. The area between Long Brook and the cornfield area adjacent to Allen Hill Road is probably not suitable for on-site subsurface sewage disposal due to high groundwater conditions and ledge as indicated on the soils map.

Consideration should also be given to the impact of increased solid waste generation.

COMPATIBILITY OF SURROUNDING LAND USES

The Brooklyn Plan of Development indicates the portion of the site east of Allen Hill Road as planned for industrial development.

ALTERNATIVE LAND USES

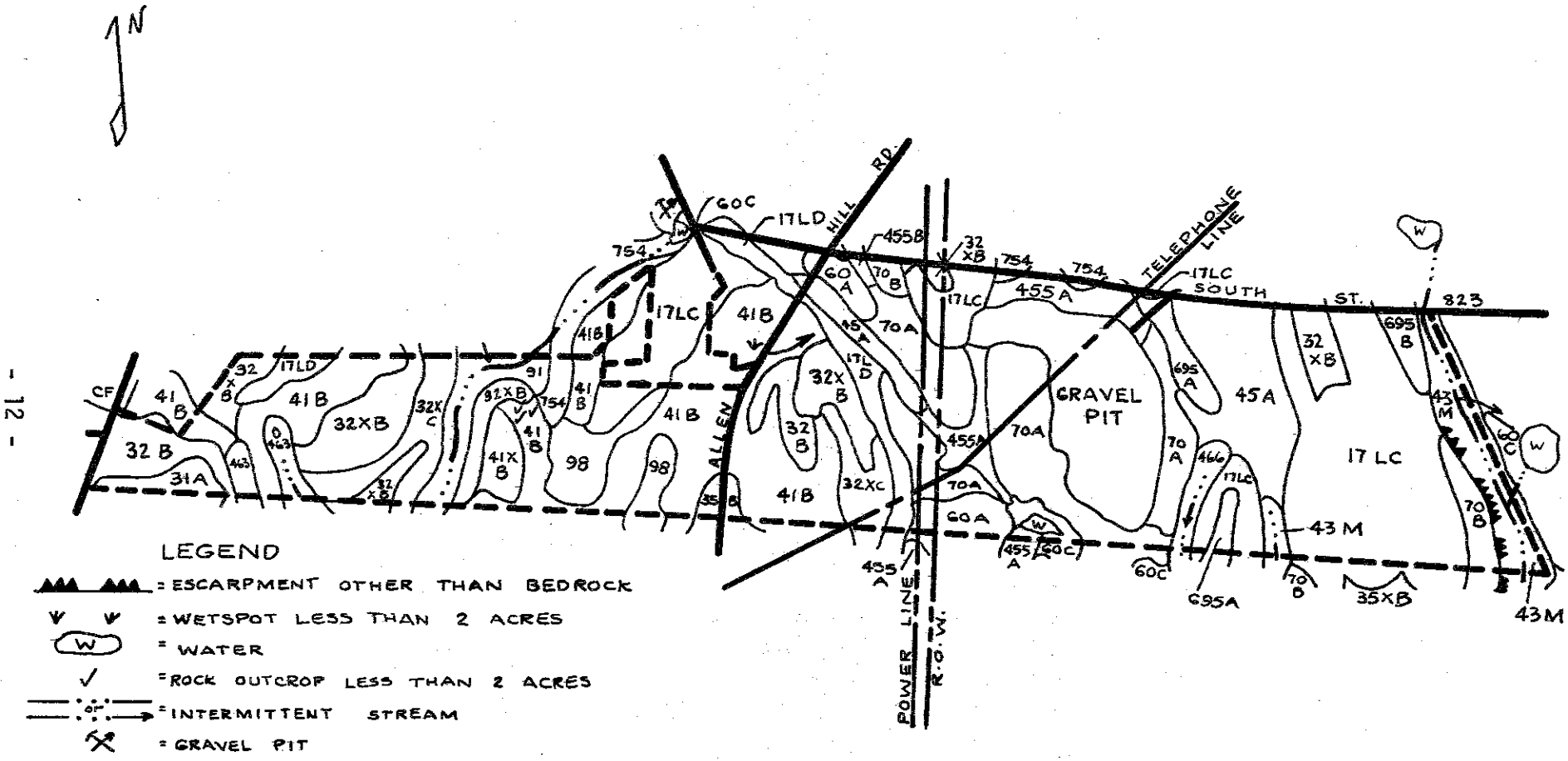
Soil survey information shows this land to be well suited to the production of woodland crops as well as agricultural crops. Soils such as Merrimac (70A), Agawam (695A), and Tisbury (45A) are in prime agriculture class II soils. Wildlife usage is presently high and thru proper management habitat quality and utilization could be increased. Any one of these uses or a combination of uses is possible and would result in maintaining the resource base. Commercial and residential development of the site will mean a trade off of these values for increased economics. All resource values should be carefully weighed before a decision to maintain the land or develop it is reached.

APPENDIX

SOIL MAP

SALMON PROPERTY

BROOKLYN, CONNECTICUT



SCALE- 1" = APPROXIMATELY 1000'

This map is an enlargement from the original 1320'/inch scale to 1000'/inch.

Prepared by: UNITED STATES DEPARTMENT OF AGRICULTURE, Soil Conservation Service.

Advance Copy, Subject to Change. May, 1976.

SALMON PROPERTY

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
Hinckley	A-1a	60A	6	2.4	Droughtiness.	1	1	1	2
Hinckley	A-1b	60C	2	.8	Slope, high water table.	2	2	3	3
Agawam	A-1d	695A	4	1.6	Droughtiness.	1	1	1	1
Agawam	A-1d	695B	2	.8	"	1	1	2	1
Merrimac	A-1d	70A	21	8.4	"	1	1	1	2
Merrimac	A-1d	70B	4	1.6	"	1	1	2	2
Tisbury	A-2	45A	16	6.4	Seasonal high water table.	2	2	2	2
Sudbury	A-2	455A	7	2.8	"	2	2	2	2
Sudbury	A-2	455B	1	.4	"	2	2	2	2
Walpole	A-3a	466	2	.8	High water table.	3	3	3	3
Adrian & Palms Muck	A-3b	91	6	2.4	"	3	3	3	3
Scarboro	A-3b	754	2	.8	"	3	3	3	3
Charlton	B-1a	32B	8	3.2	Slope, stony.	1	1	2	1
Charlton	B-1a	32XB	19	7.6	"	1	1	2	1
Charlton	B-1b	32XC	9	3.6	Slope.	2	2	3	2
Sutton	B-2a	41B	39	15.8	Seasonal high water table.	2	2	2	2
Sutton	B-2a	41XB	2	.8	"	2	2	2	2
Paxton	C-1a	35B	1	.4	Fragipan, slope.	3	1	2	1
Woodbridge	C-2a	31A	1	.4	Seasonal high water table, fragipan.	3	2	2	2
Ridgebury	C-3a	98	7	2.8	High water table.	3	3	3	3
Ridgebury & Whitman	C-3b	43M	7	2.8	"	3	3	3	3
Charlton/Hollis	D-1	17LC	53	21.2	Shallowness, slope.	3	3	3	3
Charlton/Hollis	D-2	17LD	8	3.2	"	3	3	3	3
Raynham	G-3a	463	2	.8	High water table.	3	3	3	3
Gravel Pit			20	8.0	-	-	-	-	-
TOTAL			249	100.0%					

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

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.