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environmental review team report

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
INDUSTRIAL SITES
ESSEX, CONNECTICUT

AUGUST, 1976

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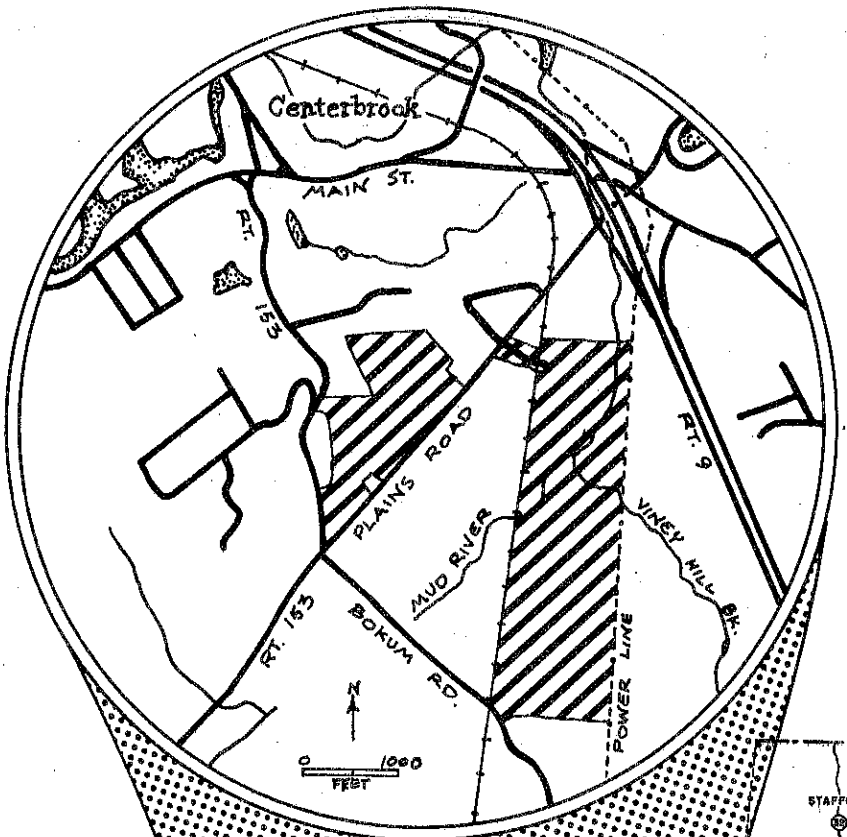
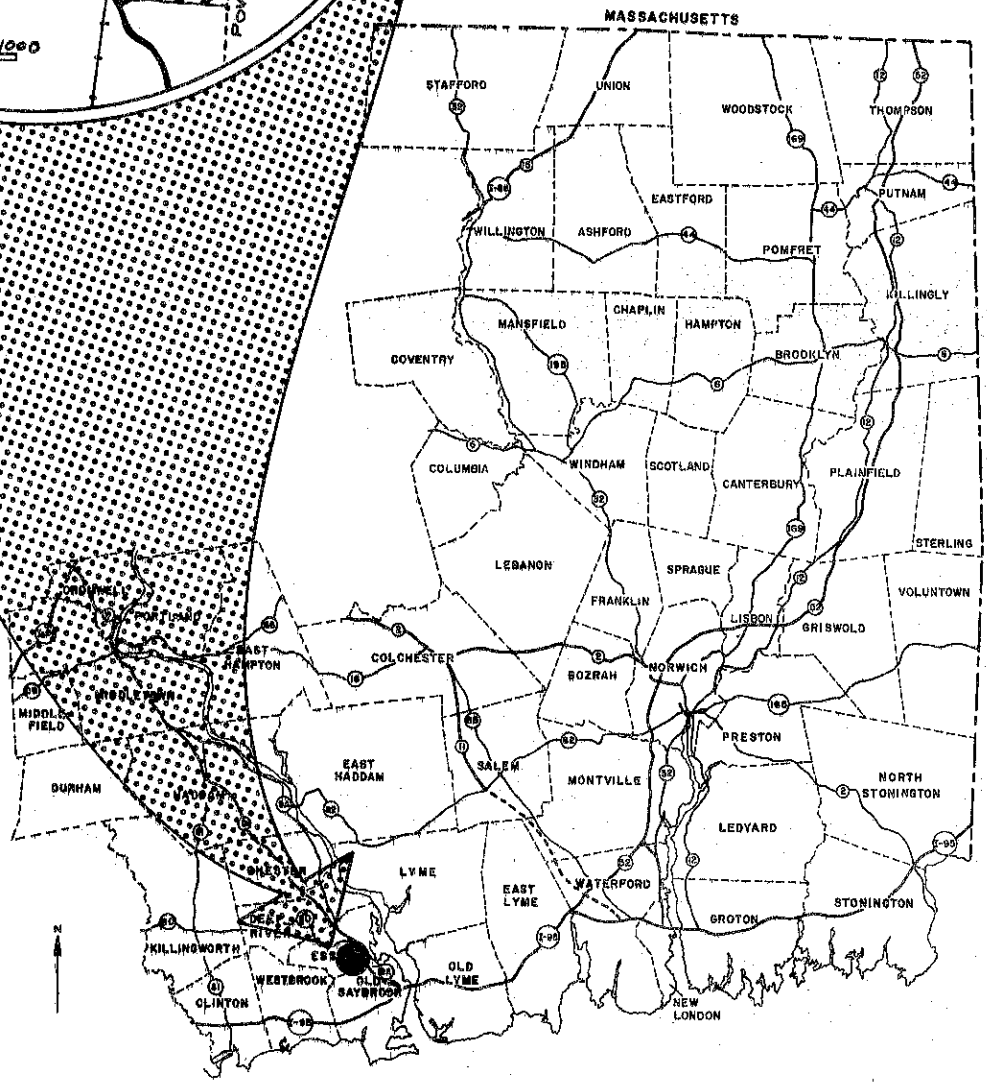
EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT PROJECT
Environmental Review Team
139 Boswell Avenue
Norwich, Connecticut 06360

LOCATION OF STUDY SITE

ESSEX INDUSTRIAL SITES

ESSEX, CONNECTICUT





EASTERN CONNECTICUT

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ENVIRONMENTAL REVIEW TEAM REPORT
ON
INDUSTRIAL SITES
ESSEX, CONNECTICUT

This report is an outgrowth of a request from the Essex First Selectman, with permission of the landowners, to the Middlesex 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 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 map as well as a topographic map of the site were distributed to all ERT participants prior to their field review of the site.

The ERT that field-checked the site consisted of the following personnel: Barry Cavanna, District Conservationist, SCS; Philip Gale, Soil Scientist, SCS; Tom Heisler, Soil Conservationist, SCS; Bill Lucas, RC&D Area Coordinator, SCS; Tim Dodge, Wildlife Biologist, SCS; Sidney Quarrier, Geologist, Connecticut Department of Environmental Protection (DEP); Charles Phillips, Fisheries Biologist, DEP; Donald Capellaro, Sanitarian, Connecticut Department of Health; David Miller, Climatologist, University of Connecticut Cooperative Extension Service; Ed Meehan, Regional Planner, Connecticut River Estuary Regional Planning Agency (CRERPA); and Linda Simkanin, ERT Coordinator, Eastern Connecticut RC&D Area.

The Team met and field-checked the site on Thursday, April 8, 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 any developers and the Town of Essex. 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

In an effort to update the Essex Plan of Development, the Essex First Selectman, responding to a request from the Planning Commission, asked for the assistance of the Eastern Connecticut Environmental Review Team in evaluating lands presently zoned for light industry. The recent construction of a major light industry (the North American Phillips Company assembly plant) has taken up a sizable portion of an area zoned for light industry. Both the Board of Selectmen and the Planning Commission wish comments from the ERT as to the suitability of the remaining land for industrial use.

The Team was asked to review approximately 140 acres of land in the Town of Essex. The total acreage comprises two sites: one parcel contains approximately 40 acres (Site A), and the other about 100 acres (Site B). Both parcels are currently zoned for light industry. The topography of both sites is nearly level, with the Mud River and associated wetlands and floodplain comprising a major portion of Site B.

Of the 140 acres reviewed by the Team, about 55 acres, or 38%, can be considered to have slight or no development limitations. A good portion of these 55 acres has already been committed to development. The remaining land uses include abandoned nursery/agriculture land on Site A, and open water wetlands, as well as brush and old field conditions on Site B. At present public water terminates at, and does not include, the sites. Public sewers are not available, nor are they planned for this section of town, so sewage disposal would have to be developed on-site.

This report will describe the natural characteristics of the two sites including topography, geology, soils, vegetative cover, and wildlife habitat. Consideration will be given to the compatibility and suitability of these resource characteristics to the industrial zoning designation of the sites. The report was chiefly concerned with (1) the Mud River, as the flatness of the terrain creates a natural settling basin prone to sedimentation, (2) potential threats to the water quality of the Mud River and associated aquifer, (3) potential flood hazard. Comments or recommendations made within the report are presented for the consideration by the Town in its planning process, whether in the preparation and review of an updated development plan, or as background for potential zone changes, and should not be viewed as mandatory or regulatory in nature.

TOPOGRAPHY

The two sites reviewed by the Team are in a broad area of lowlands near the confluence of the Mud and Falls Rivers in Essex, Connecticut. The Topography Map on the following page shows the contrast in topographic relief between the lowlands and the surrounding uplands. The sites are generally flat, and Site A is characterized by extensive wetlands and watercourses, and a local topographic relief of less than 10 feet. The uplands include much more steep land, and surface water drainage systems are more well defined. The lack of topographic relief in the lowlands, especially the Mud River, has created a slow flowing and rather diffuse surface water drainage system. Extensive areas of swamps and other wetlands surround the Mud River.

GEOLOGY

The ground materials of the two areas, uplands and lowlands, differ considerably. The uplands include numerous areas where bedrock or ledge rock is at or close to the surface. The soil materials in the uplands are developed from the "glacial" till, and are bouldery, rocky, hardpan types of soils. In the lowland the bedrock surface is deeply buried by a thick deposit (as much as 50 to 100 feet) of sand, silt, and some gravel and clay. These layered or stratified deposits were washed in and deposited by the melting waters of the most recent glacier. The soils in the lowlands are generally fine textured and vary from well drained to poorly drained depending on the local elevation.

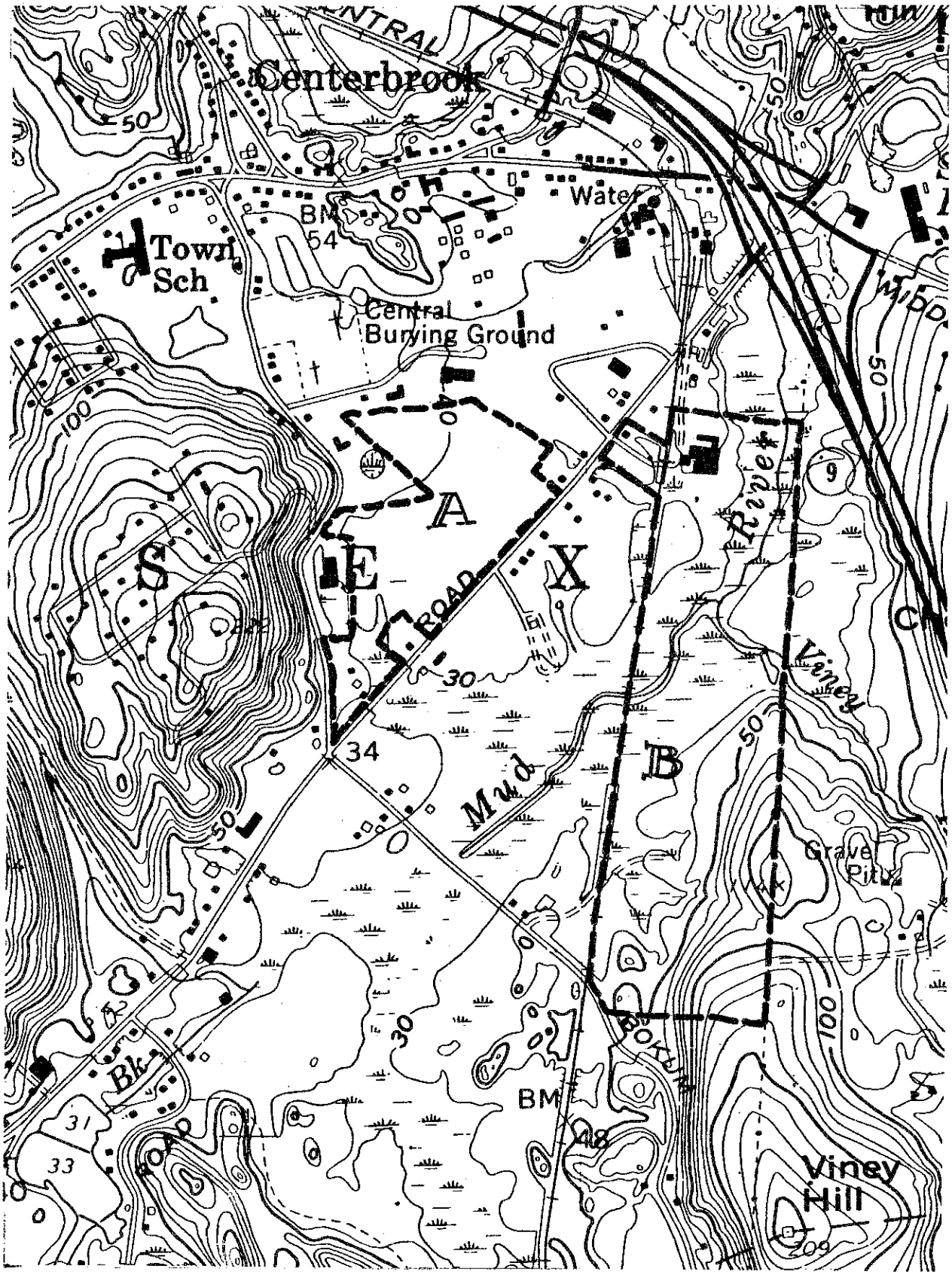
Site A

This site comprises approximately 40 acres of flat, moderately well-drained land. At the southern end of this site an area of wetlands extends over from the Mud River drainage system. The site is underlain by 60 to more than 90 feet of stratified sand, silt, and clay. This material tends to become somewhat more coarse-grained in the northern parts of the site. The relatively flat, lowlying character of the site may present development problems because of restricted surface drainage and possibly because of seasonal high ground water levels. This will be discussed further in the section on SOILS.

The considerable thickness of saturated sand and silt deposits provide the potential for developing an on-site water supply. Wells in these materials could be expected to provide from 5 to several tens of gallons per minute. The area along the northern edge of this site and the area to the northwest have been preliminarily identified by the United States Geologic Survey (USGS) as having the greatest potential in the Essex area for ground water development.

Waste disposal on the site would be primarily limited by the potentially high ground water levels. It is recommended that these ground water levels be monitored to determine seasonal high levels before planning to use the site for on-site waste disposal. Waste disposal on the site could affect ground water quality in the potential aquifer and could affect surface water quality in the Mud River system.

TOPOGRAPHY



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Site B

This site has an area of about 100 acres and is shaped as an elongate rectangle lying to the south of Plains Road, between the rail line and the power line. The Mud River and its extensive area of floodplain and wetlands cuts diagonally southwest to northeast across the site. The wetlands (especially the inland wetland soils regulated under Public Act 155) account for one-third of the total site. The southeast corner of the site includes an area of uplands with relatively steep slopes. The remainder of the site consists of relatively level, mostly well-drained lands. The recently constructed American Phillips plant occupies part of this level land.

The southern and southeast portion of the site, including the upland area, are underlain by glacial till. Till is a heterogeneous material composed of various mixtures of boulders, gravel, sand, silt and clay particles, none of which are significantly sorted or stratified according to grain size. Till deposits are normally found on hillsides and hilltops. Bedrock may well be close to the surface in parts of the upland area. The remainder of the site is underlain by a considerable thickness of stratified sand, silt, and some clay. In some areas this is as much as 70 to 90 feet thick. The wetland areas have a variable thickness (usually 0 to 5 feet) of organic muck and organic silt overlying the stratified sand and silt deposits.

In the southeastern area the steepness of the slopes and the possibility of bedrock near the surface should be important in land use considerations. In the wetland and lowlying areas, the wetness, restricted drainage, and existence of local deposits of muck should be considered.

Sources of Information About the Geology:

Bedrock Geology of the Essex Quadrangle, QR 15, Connecticut Geologic and Natural History Survey.

Surficial Geology of the Essex Quadrangle and Old Lyme Quadrangle, QR 31, Connecticut Geologic and Natural History Survey.

USGS Publications:

MF 587 A, Unconsolidated Materials, Essex Quadrangle.
MF 587 B, Resources of Coarse Aggregate, Essex Quadrangle.
MF 587 C, Contour Map of the Bedrock Surface, Essex Quadrangle.

DRAINAGE

The Mud River is the main surface drainage stream for the area, and it flows diagonally to the northeast across the Site B. This river drains an area of about 3.2 square miles of land, starting in the southwest part of the town and flowing to the northeast. It joins the Falls River in the area of Route 9. The whole central portion of the Mud River drainage system is an extensive area of lowlands through which the river meanders. The relatively flat topography causes the river to have a low gradient, and the main course of the river is surrounded by a considerable area of swamplands. The river and the adjacent lowlying swamplands have been identified by the U.S. Geological Survey and the Federal Insurance Administration, National Flood Insurance Program as a flood prone area. This will be discussed further in the section on HAZARDS. In addition, this area is also regulated by the Inland Wetlands and Watercourses Act, Public Act 155, as amended.

All of the land on the sites drains into the Mud River, either directly or through Viney Hill Brook and then into the Mud River. Water flow in the Mud River can be expected to vary from several tens of cubic feet of water per second (cfs) at time of high flow down to about 1 to 1.5 cfs for the calculated 2 year 30 day low flow. The relatively broad area of wetlands and lowlands tends to slow down peak runoff, and the large area of stratified sand material tends to maintain summer flows.

From a town planning perspective the significance of these sites is its relationship to the Mud River drainage area. The Mud River system is considered a subpart of the Falls River drainage area. Approximately 96% of Essex is drained by the Falls River System. According to the CRERPA Water Supply Study the Falls River drainage area is 17.9 square miles. Estimated average flows (c.f.s.) 35.9. The Mud River area is 3.2 square miles. This includes the Tiffany and Viney Hill Brook systems. The flow of the Mud River is estimated at an average 47,700 gallons per day. Water quality was classified in the CRERPA Water Study as A standard (the cleanest rating, suitable for water supply).

AQUIFERS OR GROUNDWATER

The U.S. Geological Survey is currently completing a water resources investigations for the Lower Connecticut River Valley. This study includes the identification and preliminary evaluation of areas that have potential for ground water development. Preliminary information from this study indicates that the stratified deposits under the Mud River area, Site B, do not have the potential for development of a major ground water supply. Although there is a relatively thick section of saturated deposits (50 to 100 feet), the materials are too fine grained to permit effective performance of high capacity wells.

The area along the Falls River and extending southward to the northern portions of Site A is underlain by coarser grained sand and gravel materials and does have the potential to produce relatively large volumes of ground water. An area of particular potential extends from the northern part of Site A northwestward towards and under the Elementary School. This area should receive further investigation if a major ground water supply is to be developed in the area.

This potential ground water area is of regional significance. This area as well as an area along the Hammonasset River appear to have the greatest potential for ground water development in the region. There are, in addition, numerous other areas where ground water supplies of smaller size could be developed. It is important that the Town of Essex further investigate the actual potential and the feasibility for development of this ground water supply. The actual potential capacity should be evaluated and most importantly, evaluation made as to the feasibility of developing the ground water when considering the existing and planned land use in the area. Ground water in this area is affected by the surrounding land use and by the quality of water in the Falls River. Large scale pumping of the aquifer would draw water from the Falls River into the ground system. Relatively strict control of land use, of waste discharges and of water quality in the Falls River would have to be maintained for the potential of the aquifer to be maintained and realized.

At the present time ground water is being withdrawn for a public water supply by the Connecticut Water Company from several wells along the Falls River watershed. Two wells are owned by the Chester Division of the Connecticut Water Company. These wells are in close proximity to Site A. The Dennison well, delivering approximately .08 mgd (million gallons per day), and the Brookside well, delivering approximately .17 mgd, are both gravel packed. The Dennison well is 53.5 feet deep, while the Brookside well is 49 feet deep. These two wells supplement the public water system's surface supply located at reservoirs in Chester and Haddam. The CRERPA long range Water Supply Study has recommended the redevelopment of the Falls River well to reach safe yield of 1.0 mgd.

The viability and continued use of these wells, and the potential for developing a major ground water supply to the northwest of Site A are partly dependent on the character and effects of land use in the basin and its effect on the quality of ground and surface water.

It is quite possible that development of the Town as presently zoned will preclude the possibility of developing the ground water supply that is estimated to exist to the northwest of Site A, and will cause pollution problems in the existing water supply wells described above. Both of these water supply areas are dependent on maintaining the high quality of water in the Falls River-Mud River system. The factors relating directly to these water supply conditions are: the types and densities of land use, waste disposal, wetlands and watercourses regulation, and the need for alternatives for water supply. The significance, interrelations, and characteristics of these factors cannot be successfully analyzed or planned on a site by site basis.

SOILS

A detailed soil map of the site is given in the Appendix of this report. As the soil map is an enlargement from the original 1,320'/inch 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 of the property. The soils map, along with the SPECIAL SOILS REPORT, Middlesex County (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 two sites. An explanation of the numbered ratings for particular land uses is provided on the last page of the Appendix.

Site A is composed primarily of Tisbury soil, 45A. This moderately well-drained soil has developed in silty mantles over sand and gravel at 18 to 30 inches. It is waterlogged in wet seasons at 18 inches in depth. This seasonal high water table limits successful year-round operation of on-site sewage disposal systems unless special measures such as drainage and fill are used. For buildings with basements, the high water table causes construction difficulties during wet seasons. Measures such as footing drains are necessary to prevent seepage into basements.

Tisbury soils are prime, class II agriculture soils. A variety of crops, from corn to late vegetables, to nursery stock, can be grown with a minimum of management. The preservation of agriculture, particularly on this site, is desirable. This is prime agricultural land. Although Site A is currently proposed in the Essex Town Plan as a future industrial site, the wetness of this parcel should be considered a limitation to intensive development. Should the town be faced with a change from its current agricultural use to an industrial use, special site design consideration should be given to the spacing of buildings, the placement of on-site septic systems, and the extent of impermeable ground cover.

Site B is composed of these general types. There are soils developed in glacial outwash material, poorly drained organic soils along the Mud River, and along the southern edge of Site B there are well-drained glacial till soils.

The glacial outwash material occurs above floodplains in river and stream valleys. The outwash soils are the excessively drained Windsor soils, the well drained Agawam and Merrimac soils, the moderately well drained Sudbury and Tisbury soils, and the poorly drained Walpole soils. The Agawam 69B, and the Merrimac 70A and 70B soils should offer little or no problem with successful operation of on-site septic systems. There is one caution however, when engineers design systems for location in soils that have the excellent percolation rates such as those characteristic of Agaway or Merrimac soils, they tend to underdesign the system. These soils have a rapid permeability, and if underdesigned, pollution of the groundwater is a possibility; it would be advisable to suggest overdesigning the leaching fields to allow more soil material to be involved in filtering the effluent so as to afford a maximum of protection to the ground water. It appears from the Team's site inspection that much of this good building area has already been utilized in the construction of the A.M.F. and the North American Phillips plants.

The organic soils are formed in organic deposits of varying thickness. They occur in depressional areas and are saturated with water most of the time, and water ponds on the surface in winter and spring. The organic soils are Adrian and Palms muck 91 and Carlisle muck 92. These soils are generally unsuited for building due to organic material and a year round high water table. The organic material is an unstable base for development, and even construction equipment. Their uses are regulated under the inland wetlands act, P.A. 155 as administered by the Essex Inland Wetlands Commission. Both soil types are composed of deposits of plant remains and are classified as very poorly drained soils. 91 soil ranges from 16 to 50 inches in depth, and the 92 soil is generally deeper than 50 inches.

The glacial till soils were formed in unconsolidated deposits of till. The well drained glacial till soils include the Canton series. The Canton 6XC, and Canton/ Charlton 6MD, are extremely stony sandy loam soils having considerable slope, and are found in the southeastern corner of Site B. These soils impose severe building limitations due to stoniness and slope, and make difficult the establishment of grass, shrubs, and trees. In final grade these soils are stable and will accept foundation development.

Site B is of course bisected by the Mud River and associated wetlands. The Mud River System is identified as a regulated inland wetlands area. As mentioned earlier, the area has also been identified as a flood prone area. Future development, especially intensive industrial uses, should be planned only upon accurate flood zone analysis. The Mud River and wetlands provides excellent wildlife habitat for wetland species. Pond development is feasible on the organic soils 91, and 92, and in the Walpole, 464. The ponds can provide recreation, wildlife habitat, fishing areas of easier access, and possible flood storage sites.

Future utilization of Site B between the railroad right-of-way and Route 9 will be restricted by the presence of wetlands and limited access points. Two industrial uses within this corridor, the American Machine Foundry (AMF) food equipment division and North American Phillips, have already located on the most suitable soils, the Agawam and Merrimac. The remaining soils are almost totally of wetland character. As recommended in town, regional and state plans, these wetlands should be controlled through a combination of flood plain zoning and inland wetlands regulations.

WETLAND FUNCTIONS

The extensive swamps and other wetlands surrounding the Mud River system tend to serve several hydrologic and other physical functions. The watercourses themselves serve to conduct surface water to downstream areas. The relatively broad area of low lying wetlands surrounding these watercourses provides an area for flood flows to spread out, lessening their impact on downstream areas. The wetlands and surrounding terrace lands provide the potential for infiltration of surface water into the ground during precipitation, and the wetlands can also serve as areas of ground water discharge during periods of low flow, providing water to the Mud River. It is recommended that more information about seasonal variations in water level be obtained concerning the wetlands areas and the adjacent terrace lands. These variations should be taken into consideration in grading and waste disposal designs.

The slow back water areas of the wetlands tend to function as effective sediment traps. This is a particularly important function in an area that is undergoing some development. An important but not well understood function of the wetlands is their capability to cleanse surface water and to improve water quality. They add oxygen, utilize excessive nutrients, and in some cases remove polluting and potentially harmful chemical and metal contaminants.

FOREST COVER

At the time of the field review, the majority of Site A was in a semi-abandonned nursery condition involving small shrubs, as well as some corn-growing. The prime agriculture soils of the site are too valuable for forest planting, and are best

suited for the apparent nursery/agriculture use which existed at one time. The commercial value of Site A is potentially very high.

Site B, which exhibits some forested condition in the southeastern corner of the site, is largely characterized by a red maple and brush swamp following the Mud River system. These woody species are not commercially valuable, nor is the site appropriate for any commercial plantings.

FISH AND WILDLIFE HABITAT

At the smaller 40 acre Site A, field borders, adjacent evergreen cover, and low growing grasses and weeds provide the major sources of food and cover. The majority of the site is used for corn production providing only limited seasonal cover and fall food, with little value during the winter months for wildlife. Bird life, primarily songbirds, and small mammals including rabbits, raccoon, and skunk use this type area. Site A does not include any fisheries resources.

About one-third of Site B is wetland and is vegetated with trees, shrubs, and other wetland plants. As indicated earlier, much of the well-drained areas in the north and south of the site have already been developed to light industry. The Mud River, a perennial stream, originates to the west of the site within the same geographical wetland and drains northeastward thru the site, emptying into the Connecticut River at North Cove. The Mud River appears to have a well defined stream channel through the site.

The wetland portion of Site B can be classified as a shrub swamp/wooded swamp complex. Dominant species include red maple, black birch, wild cherry, blueberry, pussy willow, spice bush, greenbriar, sweet pepper bush, and silky dogwood as well as wild grasses and other wetland plants. The area provides habitat to songbirds, woodpeckers and probably furbearers such as the muskrat. Waterfowl such as the woodcock and woodduck may use the area. The North American Phillips Company is developing a wildlife area around their sediment pond which will be planted to small grains and grasses, and will enhance this area for waterfowl and other small game and non-game wildlife species. The well drained areas of this site provide edge to the wetland area and increase plant diversity.

Development of these sites will result in a loss of habitat due to commitment of the resources. As with all development, the disturbance factor by man increases while quantity and probably quality of the habitat decreases. If during the planning stages open space is set aside for wildlife management and a sound plan developed some of these habitat losses can be mitigated. Planting suggestions should include a mix of trees, grasses, and small grains as well as clump planting of fruiting shrubs and vines.

The North American Phillips Company has developed this type management plan as a result of suggestions from the SCS in its recommended erosion and sediment control plan at the time of construction.

In terms of fisheries resources, the Mud River System of Site B cannot be considered as a game fish habitat, however, its functions as a nursery area for young fish and as a water source are important.

CLIMATOLOGY

General Climate from "The Climate of Connecticut" Connecticut Geological and Natural History Survey Bulletin 99, 1965.

Mean Annual Precipitation - 48 inches
Mean Annual Temp. - 50°F
Average length of frost free season - 190 days
Average winter wind velocity and direction - 9.5 mph from N
Average summer wind velocity and direction - 7.5 mph from S
Average heating degree days - 5800

An industrial park in the area will have little effect on the general climate. The gentle surrounding topography is high enough to offer some protection from the open shore but not severe enough to cause local extremes. Overall this area is close enough to the shore to have a climate ameliorated by its proximity to Long Island Sound. Therefore the heating demand on buildings is much lower than would be the case a few miles further north.

Care should be taken to maintain and protect the conifer plantation on the north side of Site A. These trees reduce the winter winds by 60 - 80% on this field and therefore reduce the heating demand considerably.

HAZARDS

Air Pollution

The prevailing winds in the area are from the SW and therefore any air pollutants generated in the Industrial Park are likely to blow over the populated center of Essex before dispersing. The proximity of the area to I-95 may cause synergistic mixing of air pollutants produced in the Industrial Park with the already heavy amount of emissions from the Interstate highway. Therefore caution should be taken to avoid any air emissions from the Park.

Erosion and Sedimentation

The Mud River System in this area, is a major inland wetland with an almost negligible slope, lending itself readily to sedimentation. The area's primary function is that of a natural sponge. Development in the wetland area would tend to reduce its water-absorbing quality. Increased or unchecked runoff into this natural settling basin is a potential threat to the water quality of the Mud River and associated aquifer.

Flood Potential

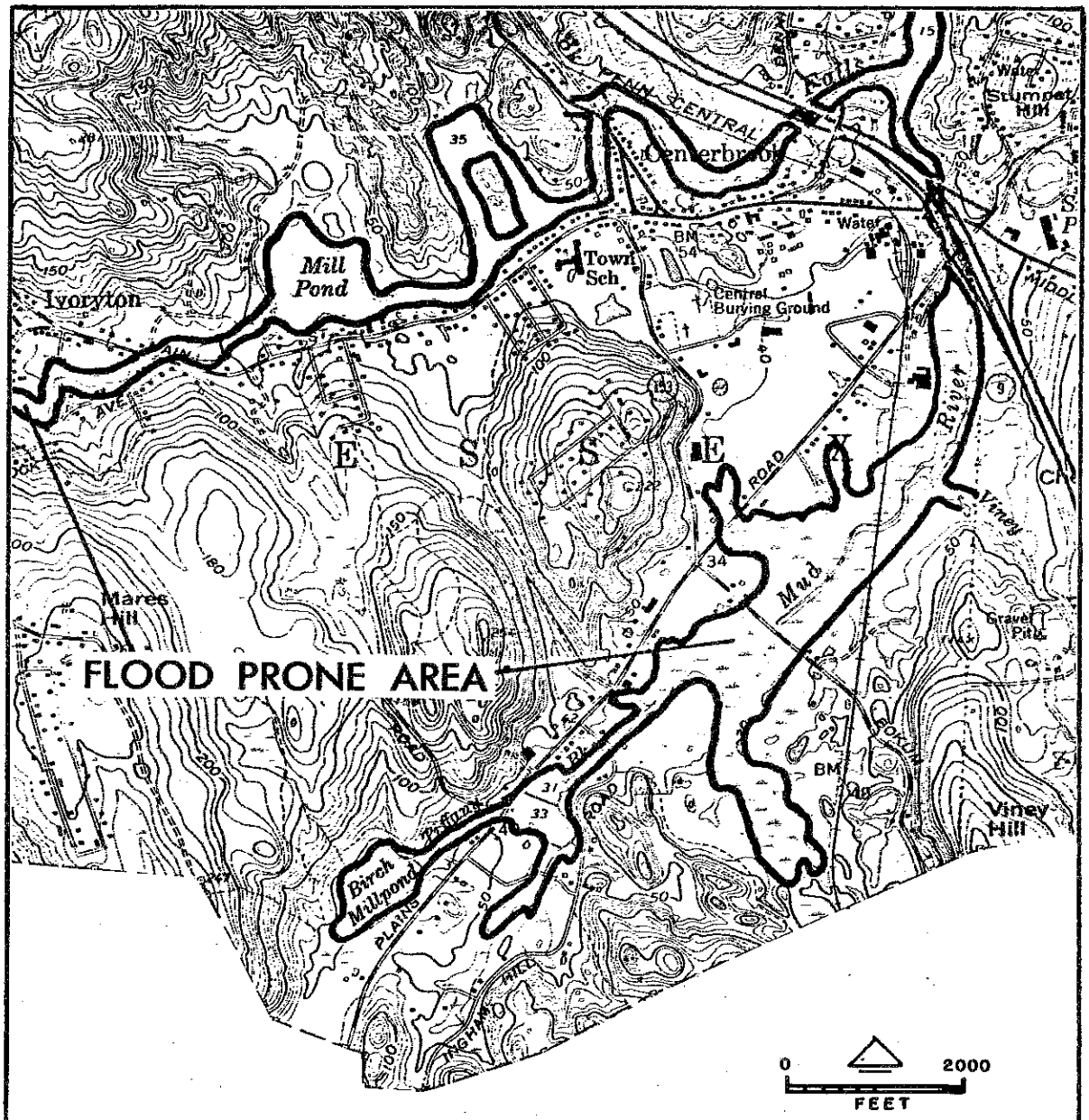
Much of the lowland and wetland area of Site B has been preliminarily identified as a floodprone area. (See Flood Prone Areas map). The Flood Insurance Administration Maps also show the site as flood prone and are on file in the Essex Town Hall. This potential problem is not due to any unusually high volumes of water that are expected to come down the Mud River. It is due to the lack of topographic relief in the wetland and watercourse area. At times of heavy rainfall and rapid runoff, water levels in the Mud River system could be expected to

FLOOD-PRONE AREA MAP

ESSEX QUADRANGLE, CONNECTICUT

U.S. GEOLOGICAL SURVEY, 1975

(revised)



Approximate boundaries of flood-prone areas are shown on this map. There is, on the average, about 1 chance in 100 that the designated areas will be inundated in any year. This information is important to public agencies and private citizens concerned with future land developments.

The flood-prone areas have been delineated through use of readily available information on past floods rather than from detailed field surveys and inspections. In general, the delineated areas are for natural conditions and do not take into consideration the possible effects of existing or proposed flood control structures except where those effects could be evaluated. Flood areas have been identified for drainage basins, depending on topography and potential use of the flood plains.

The 89th Congress, in House Document 465, recommended the preparation of flood-prone area maps to assist in minimizing flood losses by quickly identifying the areas of potential flood hazards. More detailed flood information may be required for other purposes such as structural designs, economic studies, or formulation of land-use regulations. Such detailed information may be obtained from the U.S. Geological Survey, other Federal agencies, or State, local, and private agencies.

rise several feet, covering considerable areas of adjacent lowlying ground. Any development within these wetland areas causes restructions in the natural drainage pattern, and can intensify flood conditions. The risk of flooding represents a serious drawback to the further use of the site for industrial development. The Essex Town Plan recommends that the Mud River System be protected through flood plain zoning. Uplands immediately adjacent to the Mud River are proposed for low density residential use on 1 acre.

WATER SUPPLY

At the present time public water (Connecticut Water Company) terminates at the AMF site which lies at the northern end of Site B off Route 153. It was indicated that water for the North American Phillips Plant would also be obtained from the public supply. However, this has not yet been implemented, the water presently being derived from an on-site well. Test wells which were previously installed on the same property by the Connecticut Water Company did not indicate that the expected yield would be sufficient to warrant the installation of a high production public well. While the underlying aquifer apparently has water of good quality, the type of soil and fines that are present restricts the passage of water and subsequent yield.

It would seem that if this area is going to be fully developed for industrial use, then public water should be extended in order to provide an adequate, reliable supply of potable water under proper pressure. It would appear that the most feasible way to extend this service would be along Route 153 to Bokum Road and then along that road.

Ground water for local supplies could be developed from bedrock wells in the upland areas of the site and from wells in the thick sand and silt deposits that underlie the remainder of the site. At the present time the U.S.G.S. is completing a water resources investigation in this region, and preliminary results from this work indicate that wells in the stratified deposits under this site have the general capability to provide volumes in the 10 to 30 gallons per minute range. This is sufficient to supply on-site water supply but not sufficient to consider the area as having considerable potential for development of a municipal supply. The limiting factor is the generally fine-grained texture of the stratified deposits. (Further information about the ground water information can be gotten from Connecticut Water Resources Bulletin 30, "Hydrogeologic Data for the Lower Connecticut River Valley.")

While on-site wells have and are apparently serving a number of companies satisfactorily, as the density increases along with greater demands, it will become more difficult to locate and provide adequate protection for such supplies. On-site wells also restrict and put limitations on possible areas that may otherwise be feasible for waste disposal purposes, and as public sewers are not presently planned for this section of Essex, extending public water may well be something Essex should consider immediately for this and other similar areas. The CRERPA Water Supply Study recommends the eventual extension of water service along Route 153. Future plans to extend water service south along Route 153 and Bokum Road are not known. The Connecticut Water Company's distribution system ends near the intersection of Route 153 and the railroad line. Service at this point is via a 10" main.

WASTE DISPOSAL

Consideration of the terrain and mapped soil information, which indicates a considerable portion of the land along the Mud River to be inland-wetlands, as well as visual observations indicates much of the remaining open land of Site B is generally unfeasible for on-site sewage disposal. The wetland and lowlying areas present obvious potential problems for on-site waste disposal. The level of ground water is the prime limiting factor. The upland areas have steep slopes, possible areas of extremely rapid percolation, and the possible presence of bedrock as potential limiting factors. The best areas on the site for waste disposal are the well-drained areas underlain by sandy and silty soil types.

As there are no municipal sewers planned here, it will be necessary to construct on-site systems for any new development. In general, because of the need to afford protection to the Mud River and the underlying aquifer, industrial development should be limited to those areas which have favorable site conditions, or areas needing minimum improvements for subsurface sewage disposal purposes. Limiting the overall density, controlling the types of plants (operations involved) and the kinds and volumes of wastes to be disposed of, particularly chemicals and toxic materials, are other measures that could be taken. Detailed site and engineering investigation should be made for each possible location in order to be assured of the availability of adequate suitable area, or the extent of site improvement work that may be involved. At the present time existing plants or companies have apparently located on-site systems which in general have been satisfactory, although in the case of the North American Phillips Company, considerable site work, with safeguards to minimize the possible impact on the river and the adjoining wetlands from sedimentation, was undertaken.

It is pointed out that the Connecticut Water Company has two production wells located approximately 1 - 1 1/2 miles from the properties being investigated, on the Mud and Falls River. These wells are located quite close to the surface water stream and are drawing water from coarse grained material fairly close to the surface. During periods of well operation, it should be assumed that infiltration from the Falls-Mud River system is providing recharge and that surface water from this system is being drawn into the wells.

Disposal of wastes into the ground materials of the drainage basin can end up affecting the water quality in the surface water streams. Relatively intensive development of the drainage basin using on-site waste disposal may well create surface water quality problems that will affect the public water supply wells down stream. This is especially possible if waste discharges include chemicals and materials other than human and other degradable organic waste. It is understood that the Connecticut Water Company plans to increase the yield of the wells. As these wells extend in the same aquifer as the industrial land, consideration and precautionary measures for the continued protection and maintenance of a good sanitary quality of well water is indicated. The Regional Waste Water Collection and Treatment Study recommends that the properties along Route 153 be served by sanitary sewers by 2000. On the other hand, the Essex Plan of Development does not propose that this section of town be served by public sanitary sewers.

Solid Wastes

With increased industrial development, more solid wastes will also be generated. This in turn will put further demands on the existing town refuse disposal facilities. Unless the town has adequate area available for this purpose, it will become necessary to obtain additional land or go into other methods of disposal.

ROADS AND UTILITIES

Connecticut Route 153 divides Sites A and B. Route 153 is a Federal Aid Secondary Road. It could adequately handle increased traffic. The portion of Bokum Road is a town maintained road. The portion of Bokum Road within Essex can be expanded and improved to design capacity, the portion of that road within Old Saybrook is inadequate due to hazardous curves and sight lines. Cedar Grove Terrace presently cannot provide access to the sites. A State-owned railroad track forms the western border of Site B. Connecticut Light and Power (CL&P) lines (115 KV) and (27.6 KV) cross the site.

Access to the land area between the railroad right-of-way and CL&P's 115 KV transmission lines is restricted. Cedar Grove Terrace may offer a potential access point from Route 9A. Presently Cedar Grove Terrace ends at a sand and gravel operations near Viney Hill Brook. The Essex Town Plan does not propose extension of Cedar Grove Terrace to Bokum Road. Access to Site A is excellent. Access to Site B is restricted by existing development and the presence of wetlands. The State of Connecticut owns the rail right-of-way which runs north/south through the site. This line is leased to the Valley Railroad Company. It is used for recreational excursion purposes.

AESTHETICS AND PRESERVATION

The Essex Plan of Development identifies the Mud River System straddling Site B as an essential part of the town's open space and wetlands. It is specifically mapped as an open space or waterfront greenbelt on the Plan of Development, and also on the Open Space and Recreation Plan. Preservation of this valuable water/wildlife/flood control/aesthetic resource is recommended.

Site A is proposed in the Town Plan of Development for expanded industrial uses. It was generally felt by the ERT that intensive industrial uses of both Site A and B should only be considered when public water and sewers become available.

COMPATIBILITY WITH SURROUNDING LAND USES

Within the immediate area of the reviewed sites, there are several non-conforming residential uses. These pre-date the LI-80 Zone delineation. Most of the surrounding area is vacant or in agriculture/nursery stock.

The lowland area in and around the confluence of the Falls and Mud rivers has considerable potential for a number of different kinds of land use. Much of the land is level and fairly well drained and easy to build on. Major transporta-

tion facilities and residential areas exist nearby. At the same time the land has considerable potential as a resource producing area. Much of the land is good for agriculture and a major ground water supply may exist under certain areas. Significant areas of this land have been identified as having a potential for flooding and many of these same areas are regulated wetlands. There is an identified public need for each of these basic land uses: development, resource provision, and conservation of wetland areas. In this case the potential for all three exists on one general area of land. In part, the various kinds of potential land uses are in mutual conflict. It is suggested that only through a very careful and thorough process of planning can a constructive, viable use of this land area be assured.

KEY

It appears that the present zoning, including the two industrial sites, has set up a situation of mutually and potentially conflicting land use objectives and resource and conservation expectations. An area of potential ground water supply is zoned for high density residential and industrial development. An existing ground water supply is immediately adjacent to a stream system, the bank areas of which are zoned for high density development. A relatively large area of regulated wetlands and floodprone area is zoned for industrial development. Continuation of development under the present zoning, and with on-site sewage disposal, would probably negate the potential for ground water development, including having negative effects on the existing wells as indicated earlier in the section on WASTE DISPOSAL. In addition, wetlands regulation is likely to become a highly controversial and problematical situation.

res?

The lowlands area has the potential for a number of viable land use schemes involving mixtures of development and resource conservation concepts. Successful mixes of these kinds of land uses can best be achieved through a detailed planning process that identifies and provides the means for achieving desired planning objectives. If protection and utilization of a ground water resource is a major planning objective, then surrounding land uses must be planned and regulated so as not to destroy the ground potential. If wetland and floodprone areas are to serve as more than concrete ditches conducting water through the Town, then surrounding land uses must be planned so as not to direct specific development pressure on the wetlands themselves. An integrated and detailed land use plan for the whole lowland area is the only method to insure the orderly and constructive development of the area while at the same time realizing the identified planning objectives.

The suitability of the identified industrial Sites A and B for industrial development cannot be effectively evaluated without having a unified and detailed land use plan for the area if water resource and wetlands conservation considerations are to be included.

Brief Review of Existing Land Use Plans

The CRERPA Regional Plan of Development, adopted May 5, 1975, recommends that the Mud River, Viney and Tiffany Brook systems be protected as natural resource areas. A portion of the sites with frontage along Route 153 is proposed for village use and densities. The object of the village land use classification is one of managed growth. Areas selected for village density are based on existing land uses, circulation systems, and the presence of non-limiting natural resources. Village density areas are expected to absorb the bulk of future residential, commercial and industrial growth during the next two and a half decades. A full

Presently do not have sewers in the Village Area.

complement of public services, i.e. public water and sewer systems, are recommended in the Regional Plan as essential components of village areas.

The State Plan of Conservation and Development, Land Use Policy Map, identifies the Mud River drainage area as future permanent open space and future limited development. Limited development areas are intended to be served by on-site water and sewer systems. The Plan of Conservation and Development, Water Use Policy Map, further identifies the Mud River system as a high priority aquifer area.

The Essex Zoning Regulations and Map classified this portion of town as an (LI-80) Light Industrial 80,000 minimum square foot District. Maximum building coverage is set at 25%. Additional space demands for off-street parking and truck loading are set forth in the zoning regulations. Land coverage requirements depend on the type of use proposed.

ALTERNATIVE LAND USES

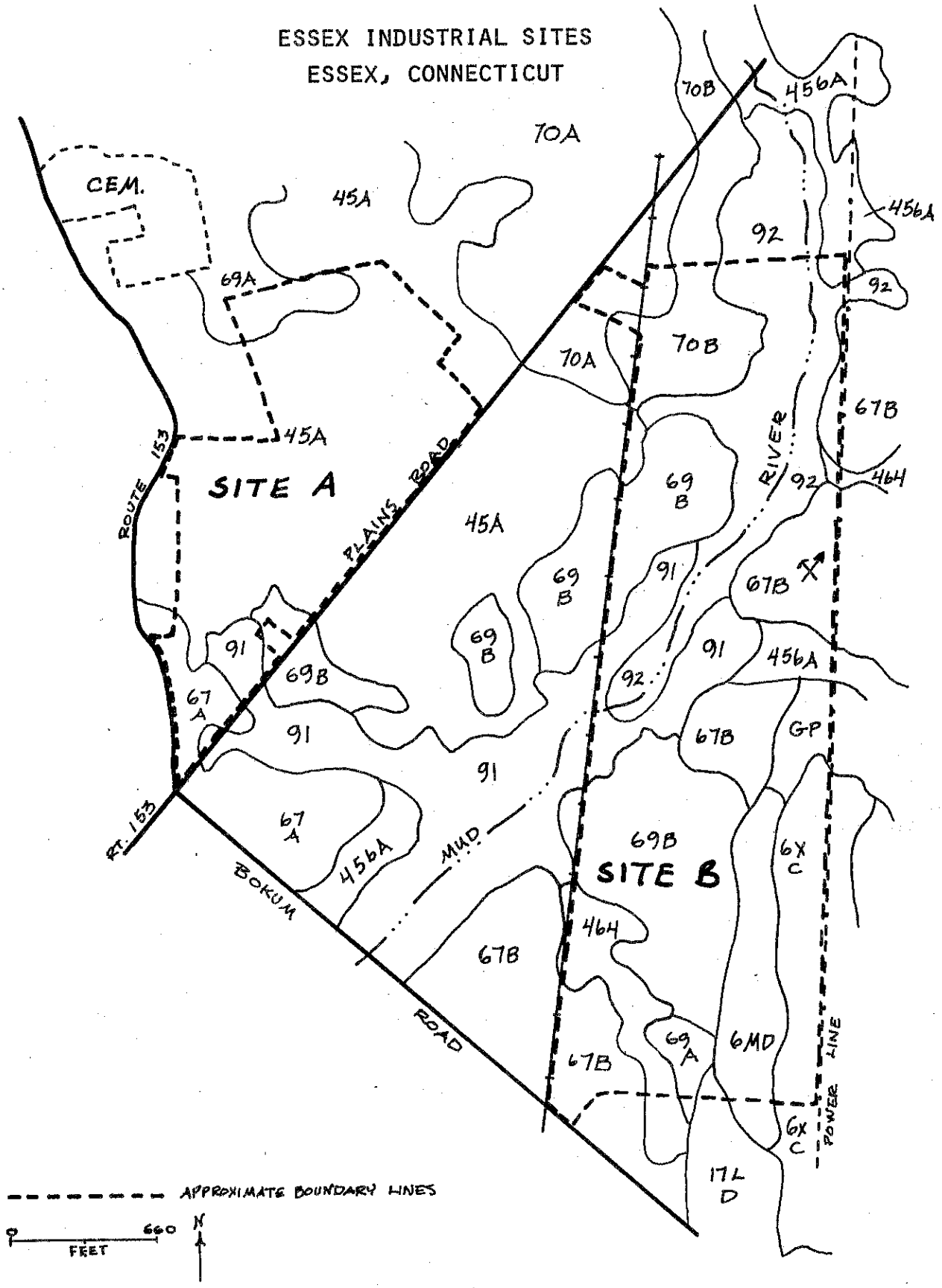
Relative to the existing natural resource conditions characteristic of the industrially zoned sites reviewed by the Team, and the absence of public water and sewer services for these sites, the agriculture/nursery use of Site A may be a better alternative to industrial use.

Similarily, the preservation of the Mud River system for its water resource/flood control/wildlife habitat/capacities may be a better alternative to industrial use.

APPENDIX

SOIL MAP

ESSEX INDUSTRIAL SITES
ESSEX, CONNECTICUT



The map is an enlargement from the original 1320'/inch scale to 660'/inch.

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

ESSEX INDUSTRIAL SITES

PROPORTIONAL EXTENT OF SOILS AND THEIR LIMITATIONS FOR CERTAIN LAND USES

Soil Series	Soil Symbol	Approx. Acres	Percent of Acres	Principal Limiting Factor	Urban Use Limitations*			
					On-Site Sewage	Buildings with Basements	Streets & Parking	Land-Scaping
SITE A								
Tisbury	45A	33.5	23.8	Wetness	3	3	2	1
Windsor	67A	3	2.1	Very rapid permeability in the sub-stratum	1	1	1	3
Agawam	69A	3.5	2.5	"	1	1	1	1
TOTAL:		40.0	100.0%					

* Urban Use Limitations: 1 = slight; 2 = moderate; 3 = severe

ESSEX INDUSTRIAL SITES

PROPORTIONAL EXTENT OF SOILS AND THEIR LIMITATIONS FOR CERTAIN LAND USES

Soil Series	Soil Symbol	Approx. Acres	Percent of Acres	Principal Limiting Factor	Urban Use Limitations*			
					On-Site Sewage	Buildings with Basements	Streets & Parking	Land-Scaping
SITE B								
Canton	6XC	8	5.7	Slope, stoniness	3	3	3	3
Canton + Chalton	6MD	6	4.3	Slope, stoniness	3	3	3	3
Hollis-Chalton	17LD	.5	.4	Slope, depth to bedrock	3	3	3	3
Windsor	67B	15.5	11	Very rapid permeability in the sub-stratum	1	1	1	3
Agawam	69B	24.5	17.4	"	1	1	1	1
Merrimac	70A	2	1.4	"	1	1	1	2
Merrimac	70B	6	4.3	"	1	1	1	2
Adrian + Palms Muck	91	9.5	6.8	Poorly drained, floods	3	3	3	3
Carlisle Muck	92	18	12.8	"	3	3	3	3
Sudbury	456A	3.5	2.5	Occasional high water table	3	3	2	1
Walpole	464	4.5	3.2	Poorly drained	3	3	3	3
Gravel Pit	GP	2.5	1.8					
TOTAL:		100.5	100%					

* Urban Use Limitations: 1 = slight; 2 = moderate; 3 = severe (see the next page for a further explanation of limitations 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.