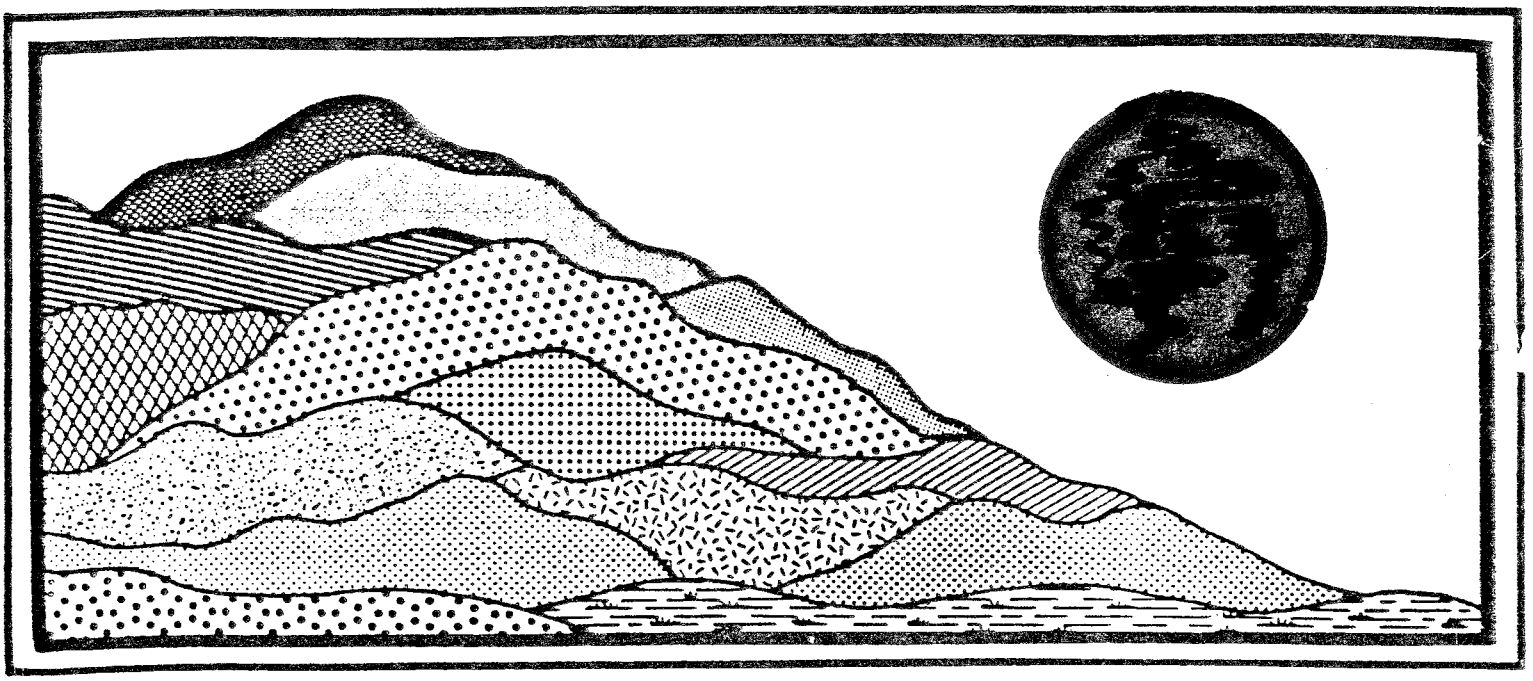
Cluster Development

South Windsor, Connecticut

September 1986



ENVIRONMENTAL REVIEW TEAM REPORT

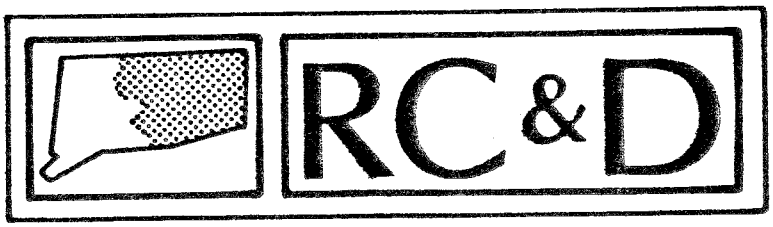
EASTERN CONNECTICUT RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

Cluster Development

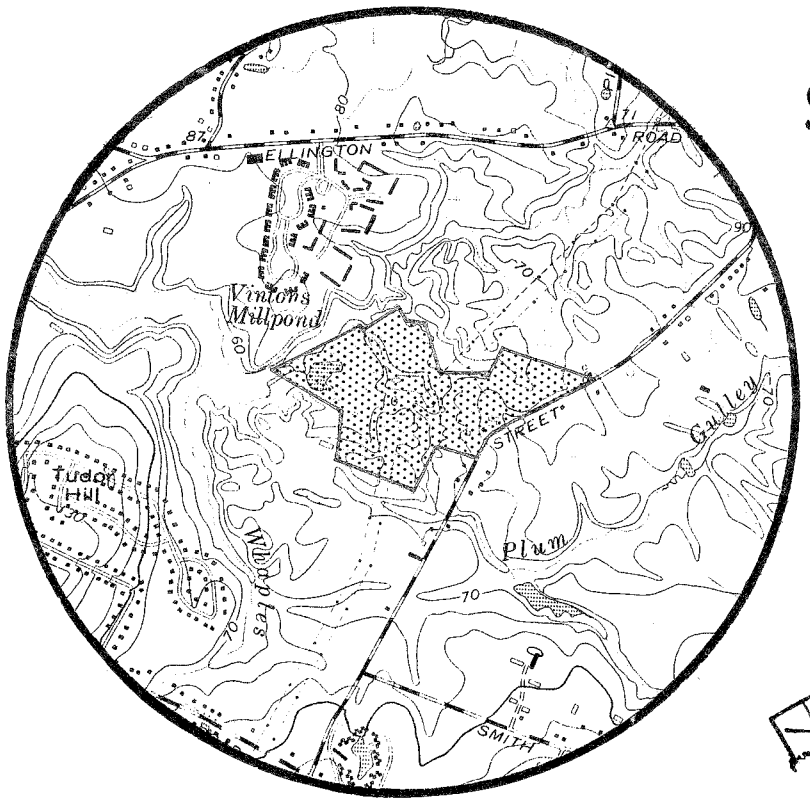
South Windsor, Connecticut

Review Date: JULY 15, 1986

Report Date: SEPTEMBER, 1986



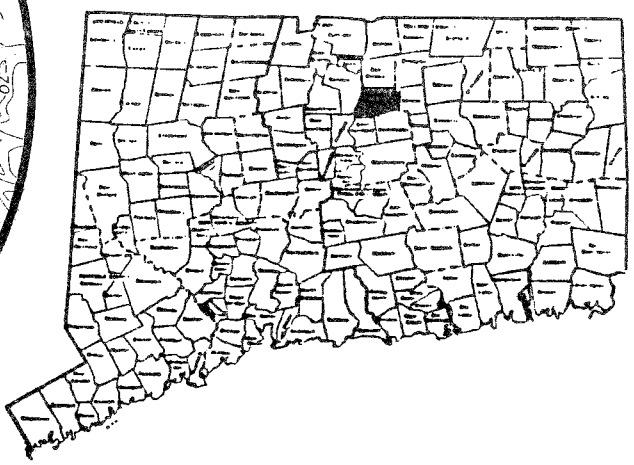
ENVIRONMENTAL REVIEW TEAM
PO BOX 198
BROOKLYN, CONNECTICUT 06234

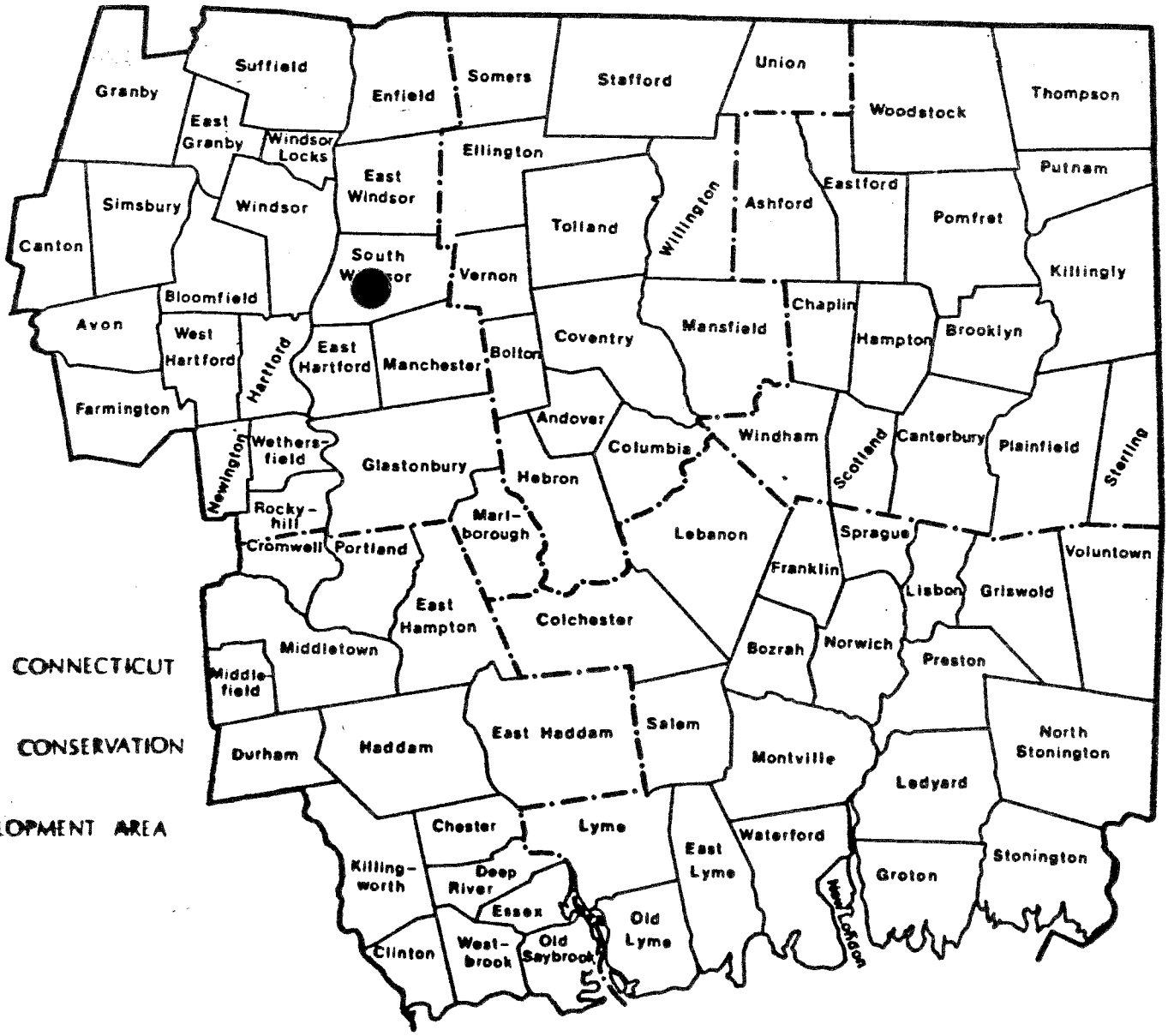


Site Location

FIANO CLUSTER DEVELOPMENT

SOUTH WINDSOR, CONNECTICUT





EASTERN CONNECTICUT

RESOURCE CONSERVATION

& DEVELOPMENT AREA

ENVIRONMENTAL REVIEW TEAM REPORT
ON
THE FIANO CLUSTER DEVELOPMENT
SOUTH WINDSOR, CONNECTICUT

This report is an outgrowth of a request from the South Windsor Planning and Zoning Commission to the Hartford 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 and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

The ERT met and field checked the site on July 15, 1986, Tuesday. Team members participating on this review included:

Doug Cooper	- Principal Environmental Analyst - DEP, Water Resources Unit
James Parda	- Forester - Connecticut Department of Environmental Protection
Amy Parker	- District Manager - Hartford County Soil and Water Conservation District
J. Eric Scherer	- Resource Conservationist - USDA Soil, Conservation Service
Elaine Sych	- ERT Coordinator - Eastern Connecticut RC&D Area
Bill Warzecha	- Geologist - DEP, Natural Resources Center
Judy Wilson	- Wildlife Biologist - Connecticut Department of Environmental Protection
Mike Wosniak	- Community Development Planner - Capitol Region Council of Governments

Prior to the review day, each team member received a summary of the proposed project, a list of the Town's concerns, a location map, a topographic map, a soils map and a preliminary site plan. During the field review the team members were given a revised site plan. The Team met with, and were accompanied by the planning director, the town engineer, the developer and his architect and engineer. Following the review, reports from each team member were submitted to the ERT Coordinator for compilation and editing into this final report.

This report represents the Team's findings. It is not meant to compete with private consultants by providing site designs or detailed solutions to development problems. The Team does not recommend what final action should be taken on a proposed project--all final decisions and conclusions rest with the Town and landowner. 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.

The results of this Team action are oriented toward the development of better environmental quality and the long-term economics of land use.

The Eastern Connecticut RC&D Executive Committee hopes you will find this report of value and assistance in making your decisions on this proposed cluster development.

If you require any additional information, please contact:

Elaine A. Sych
ERT Coordinator
Eastern Connecticut RC&D Area
P. O. Box 198
Brooklyn, CT 06234
(203) 774-1253

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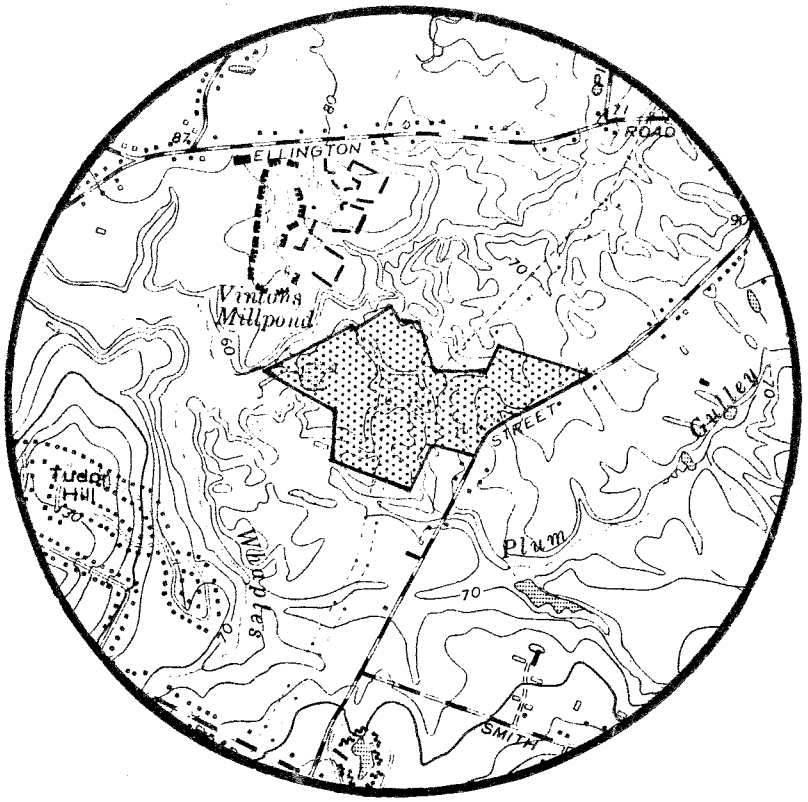
TABLE OF MAPS AND CHARTS

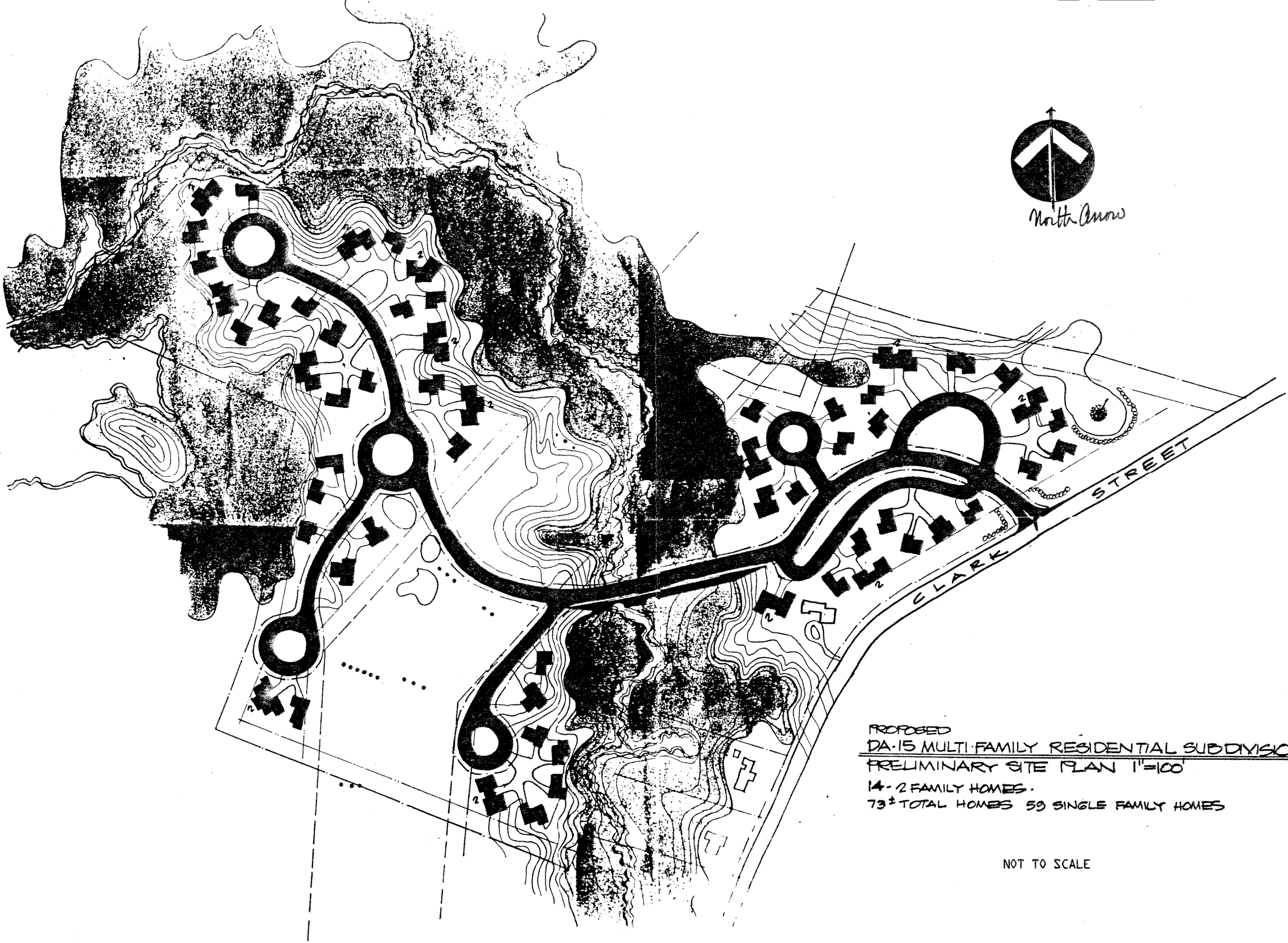
I. INTRODUCTION

The South Windsor Planning and Zoning Commission requested Environmental Review Team assistance in reviewing a proposed cluster development in its initial stage.

The project consists of building 69 clustered single family and two-family homes on 47 acres fronting on Clark Street.

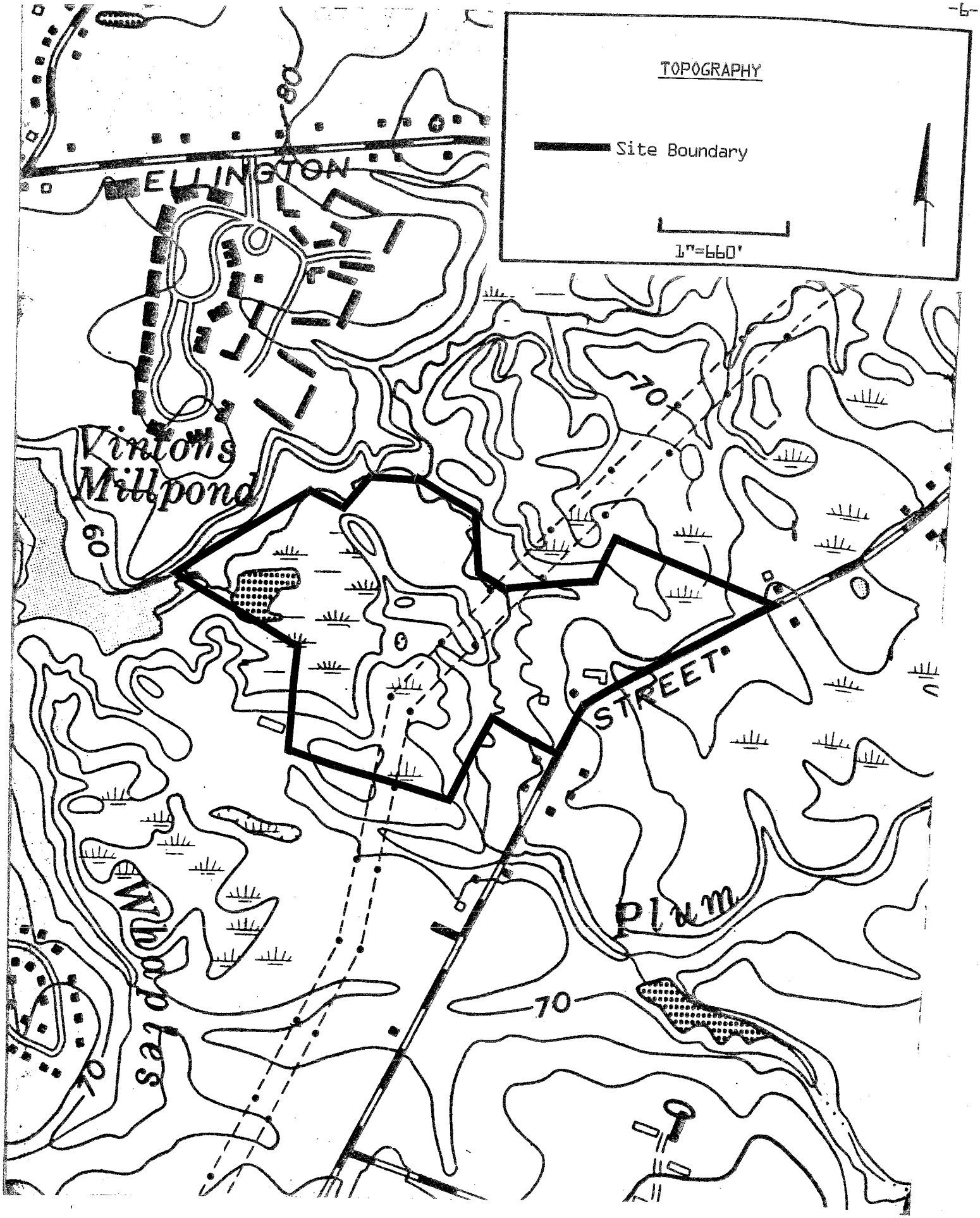
The Town requested ERT assistance because of the environmentally sensitive area involved. It is important to note that assessment of impacts of the proposed development will be limited due to the preliminary nature of the plans. The information provided in this report will assist the project developer and the Town in working with the land and resources available. Once detailed plans are developed further review of environmental impacts will be warranted. The summary of this report highlights the Team's major findings and recommendations.





PROPOSED
DA-15 MULTI-FAMILY RESIDENTIAL SUBDIVISION
PRELIMINARY SITE PLAN 1"=100'
14-2 FAMILY HOMES.
73± TOTAL HOMES 59 SINGLE FAMILY HOMES

NOT TO SCALE


TOPOGRAPHY
Site Boundary
1"=660'
ELLINGTON
80
Vinton's
Millpond
60
70
STREET
Plum
Saddle Creek
70

II. TOPOGRAPHY AND SETTING

The ± 47 acre parcel of land to be developed for residential use is located on the west side of Clark Street in the southcentral part of Town. Access to the site will be off of Clark Street.

The land is characterized by mixed hardwood forests, meadows and former agricultural lands. Floodplains parallel the Podunk River along the western border, and Plum Gulley Brook, which bisects the property, in a northerly direction. High tension power lines bisect the central parts of the site.

The general topographic conditions on the site are flat to gently rolling. The only significant slopes are those which rise quickly from low-lying areas on the site to the elevated parts of the site. These slopes were probably created as a result of down-cutting by the Podunk River and Plum Gulley Brook. These slopes should not pose any major problems in terms of the proposed development.

Three (3) notable basins, each presently filled with swamp vegetation are loacted within the property.

III. GEOLOGY

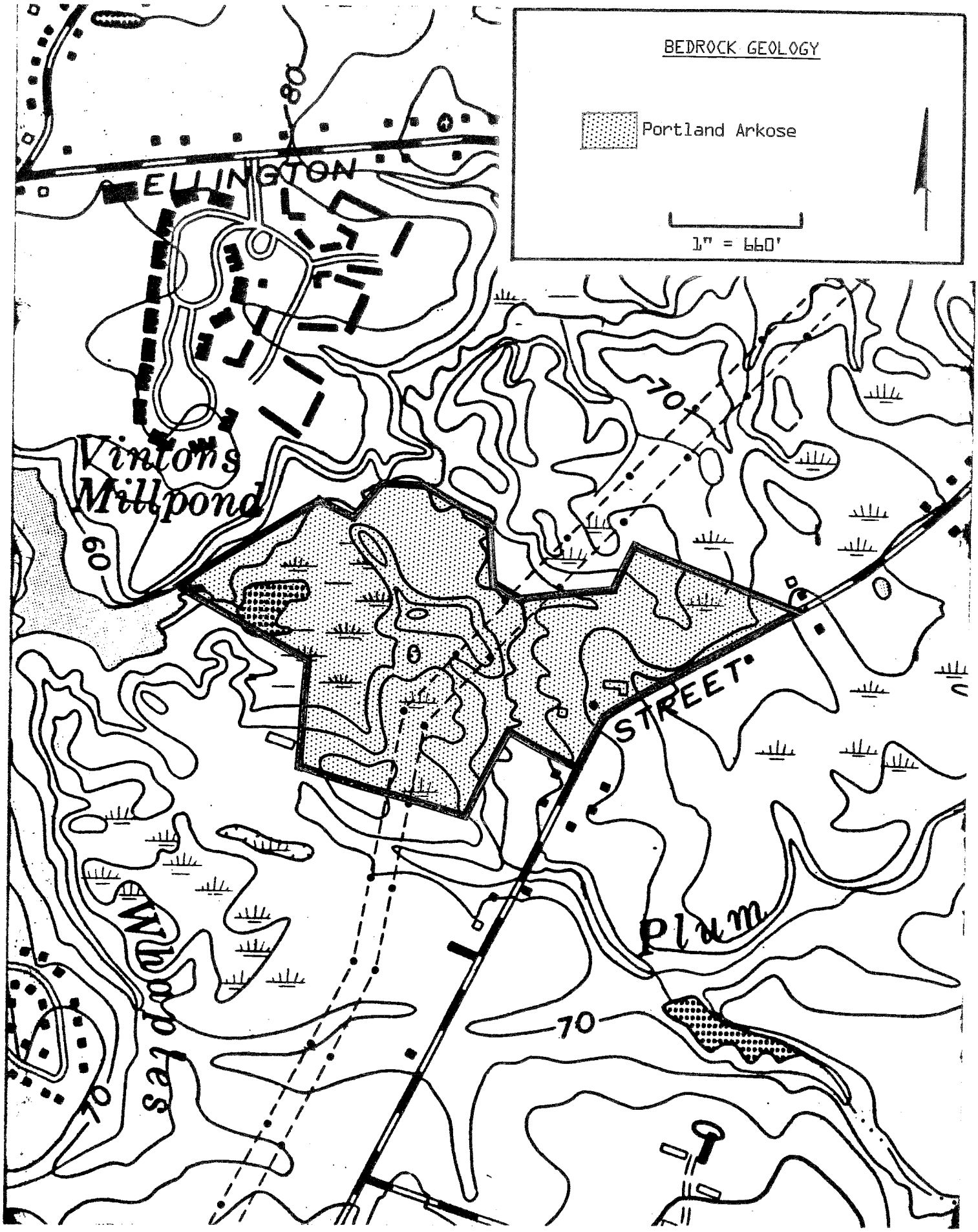
The Fiano Property is located in an area encompassed by the Manchester topographic quadrangle. A bedrock geologic map and surficial geologic map by Roger Colton (1965) have been prepared for the quadrangle. A bedrock geologic map and surficial geologic map by Roger Colton (1965) have been prepared for the quadrangle and published by the U. S. Geological Survey. (Map GQ-433).

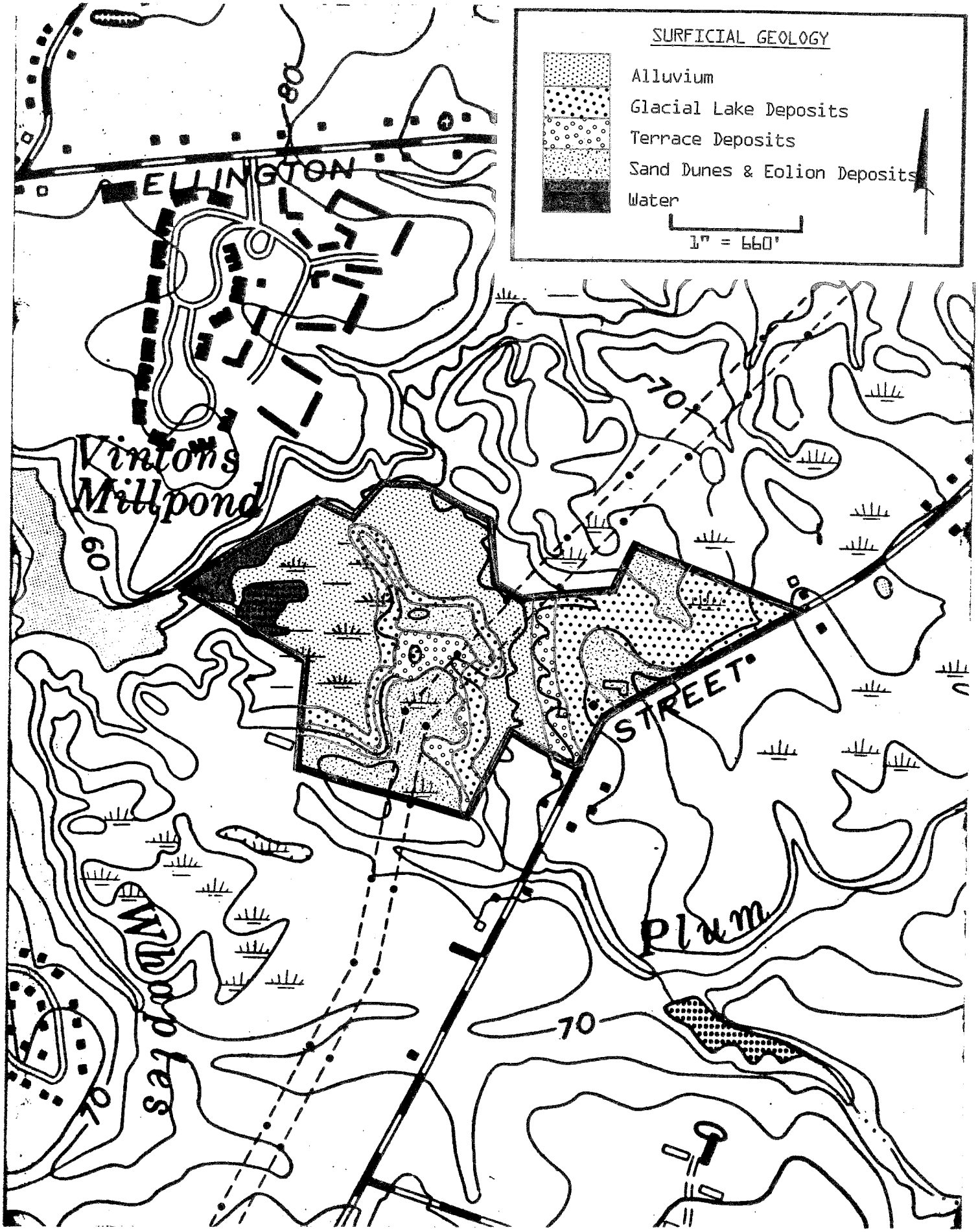
Bedrock does not break the ground surface within the site. In fact, the bedrock surface is quite deep throughout the entire parcel. According to the map entitled Depth to Bedrock, Manchester Quadrangle Connecticut, by Elinor H. Handman and Roger B. Colton (1973), the bedrock surface is about 200 feet below ground level throughout the eastern parts. It becomes less deep in the western parts ranging between 100-150 feet below ground level.

Colton describes the bedrock underlying the site as Portland Arkose. It consists of reddish brown and gray arkosic siltstone, sandstone and conglomerates. The term arkose and arkosic mentioned above are used to describe the rock's mineral composition, primarily feldspar and quartz.

Portland Arkose consists of sediments that were deposited mainly by streams but occasionally in lakes during the Mesozoic geologic era. The rocks are approximately 170-180 million years old.

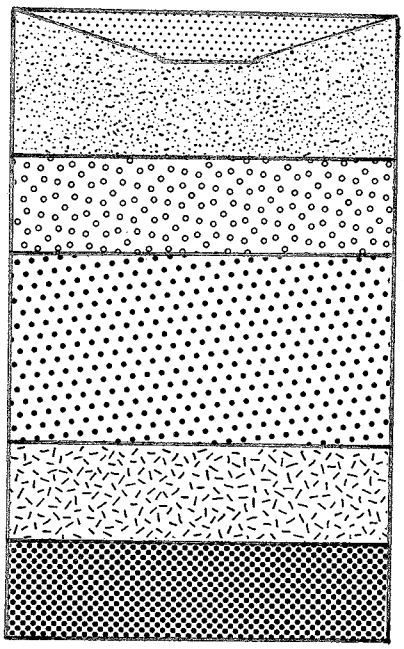
Because the bedrock surface lies at such great depths throughout the site, it should pose no major problems in terms of the proposed residential development.


BEDROCK GEOLOGY
Portland Arkose
1" = 660'
ELLINGTON
80
Vintons
Millpond
60
70
STREET
Plum
Sadd
Wbd
70
70


SURFICIAL GEOLOGY
Alluvium
Glacial Lake Deposits
Terrace Deposits
Sand Dunes & Eolion Deposits
Water
1" = 660'
ELLINGTON
80
70
60
Vintons
Millpond
STREET
Plum
Sandy Wharf
70
70

SURFICIAL GEOLOGY

A CROSS SECTION OF THE SITE MIGHT LOOK LIKE THIS.



ALLUVIUM

SAND DEPOSITS AND EOLION

TERRACE DEPOSITS

RELATIVELY THICK
LAKE DEPOSITS

THIN BLANKET OF TILL

PORTLAND ARKOSE BEDROCK

The unconsolidated materials covering the site are of more recent origin compared to the 170-180 million year old bedrock on which it rests. Most of these materials were deposited by glacier ice or meltwater streams. Evidence from other parts of the United States, primarily the mid-west, indicates that glaciers advanced southward from Canada several times during the last million years. Most of the glacial sediments in Connecticut appear to date from the most recent of these advances, which climaxed about 18,000 years ago. Till is the oldest sediment. Till was deposited directly from the surface of, within, and beneath the ice, mainly while the ice was continuing to move forward. As a result, the various grain sizes from clay to boulders are mixed together in a complex, irregular fashion. Till is not exposed on the ground surface within the site, but according to subsurface data it covers a relatively thin blanket over the bedrock surface beneath the site. (Map GQ-433, Colton)

Approximately 13,000-14,000 years ago, the ice from the most recent glacial advance had melted back to northern Connecticut. Thinning at the margins resulted in the detachment of large blocks of ice, while continuing flow in the thicker ice to the north, produced more and more rock debris. The debris was carried forward by meltwater streams, which sorted it by grain size.

At some time during the period of glacial retreat, ice and sediment formed a blockage or dam in the Connecticut Valley in the vicinity of Rocky Hill. Water backed up from that blockage resulted in a lake of large proportions. The glacial lake has been given the name Glacial Lake Hitchcock. Meltwater entering the lake deposited sediment rapidly, building a series of coalescing deltas along the lake shore. Fine materials (clay, silt, and fine sand) were deposited on the lake bottom, often in a varved (alternating) sequence. Lake-bottom sediments cover some parts of the study site mainly as a thin band between the lowlands area (floodplain) and the elevated parts of the property. According to Colton, the thickness of the lake deposits beneath the site may be as much as 150 feet thick.

Overlying the lake deposits on the site is a moderately thick blanket (as much as 20 feet) of water deposited materials called terrace deposits. The terrace deposits on the site consist of yellowish brown, well laminated sand, silt and clay which may be locally pebbly. They were carried forward over the "lake deposits" by meltwater streams during glacial retreat.

The final two (2) types of surficial geologic deposits found on the site are sand dunes/eolian (wind-blown) deposits and alluvium.

Sand dunes/eolion deposits consist of fine-grained particles such as sand and silt which formed following the draining of Glacial Lake Hitchcock. The presence of bare soils (no vegetative cover) following the disappearance of Lake Hitchcock, was the source of the sand dunes/eolian deposits on the site.

Alluvium, which parallels the Podunk River and Plum Gulley Brook silt, consists of light grayish-brown silt, sand and gravel. These are generally poorly drained soils with the water table lying within a few inches of the surface of the ground during most of the year.

IV. GEOLOGIC DEVELOPMENT CONCERNS

The alluvial soils present on the site, because of their susceptability to flooding and their poor drainage, hold low potential for development. According to the project engineer, the alluvial soils on the site will be avoided except for the proposed road crossing (see Hydrology Section).

The soils which constitute the upland portions of the site should pose no major problems in terms of development especially since public water and sewer lines are available for the parcel. However, the major concern for the installation of sewers, waterlines and electric lines is the possibility of "cutback cave-ins" in the upland soils. The trenches in these sandy soils should have the pipes and conduits placed and backfilled as soon as possible after excavation. Proper shoring of sides should be accomplished in trenches over five (5) feet deep. Running sewers across drainage ways is another area of special concern; disturbed areas should receive protection from any running water. It should be pointed out that the project engineer indicated that the sewer line will not cross any of the watercourses in the site.

It is not known if the lake deposits, which may contain clay particles, have presented problems in other areas of town, in terms of supporting the weight of buildings, bridges, etc. However, it might be wise to take soil borings to determine the clay content and its ability to support the weight of foundations and pre-fabricated bridge structures.

Because alluvial soils are regulated under Public Act No. 155, any activity which involves the filling or modifying wetland areas requires a permit from the Town. These poorly drained and very poorly drained soils should be flagged on the site by a certified soil scientist. Once these boundaries have been determined, they should be superimposed on the subdivision plan.

V. SOILS CONCERNS

1.) Detailed hydrologic computations reflecting existing and future drainage conditions on site and within the surrounding watershed will be needed when developing final plans.

2.) There are extensive valuable wetlands on the site, and it is recommended that building within these areas be avoided. It is suggested that a certified soil scientist be retained by the developer to determine accurate wetlands and floodplain limits on the site.

3.) Both soil and slopes at the site will offer challenges for development. A high erosion hazard exits on the steep slopes of these highly erodible soils. Careful design and implementation of a Soil Erosion and Sediment Control Plan will be necessary to ensure protection of on and off-site resources.

4.) Draft Plans received for this review were generally lacking in enough detail to determine on and off-site impacts of the proposed development. More soil and topographical information will be needed. Once information and design are developed a second review would be in order.

5.) Location of proposed stormwater detention basins were shown at the review meeting but not indicated on plans for the field review. It is strongly suggested that all stormwater detention basins be constructed out of the 100 year floodplain and wetlands.

6.) Phasing of the development will greatly aid in reducing negative impacts to environmentally sensitive areas. Crossing of Plum Gulley Brook will need to involve detailed planning. The approach described by the developer at the review meeting appears to be a reasonable approach.

7.) The small depressional wet areas next to the transmission power lines appear to have little value in an overall view of the site, particularly when the area is developed. Removal of these areas by filling could be considered.

8.) Some planning consideration should be given as to how the transmission power lines are to be maintained. Visual screening should be deployed along the access across the transmission power lines and along the boundary lines themselves to screen out the aftermath of vegetation control in this right-of-way.

9.) If proposed grades for the project will follow those illustrated in the review plan, significant removal of existing vegetation will be required. Careful site planning and layout will be necessary in order to save existing trees.

VI. SOILS

The soils at the site are typical of those found throughout the area in the immediate drainage basins of Plum Gulley Brook and the Podunk River. These soils range from very deep, excessively well-drained soils on glaciofluvial land forms to deep, very poorly drained soils on floodplains formed in recently deposited alluvial material. The soils map shows the soil distribution within the proposed development site. These soils were mapped at a scale of 1:2000 (1" = 166.7'). Five (5) map units are represented on this map (Sheet number 27 of the Soil Survey of Hartford County, 1962). These map units include: Elmwood very fine sandy loam (EoB), 3 to 8% slopes; Melrose very fine sandy loam (MnB), 3 to 8% slopes; Saco silt loam (SbA), 0 to 3% slopes; Terrace Escarpments, sand and clay (Te), 25 to 50% slopes; Windsor loamy fine sand (WvB), 3 to 8% slopes.

Due to the scale mapped, some important soil detail cannot be represented on the soil map. A more extensive network of short steep slopes exist at the site, indicating that more of the Te map unit may exist. The Te map unit has many limitations for development, the most improtant one is the potential for slippage on these steep slopes. There are also a number of areas of wetland soils that were too small in size to be shown at the scale mapped. These wetland areas could be shown by a more intensive soil survey. The major limitating factors of soils at this site are steep to very steep slopes, highly erodible soils and seasonal high water tables. The Soils Limitations Chart gives a more detailed listing of soil limitations of the site for development.

TABLE

SOIL LIMITATIONS CHART

MAP UNIT SYMBOL	DRAINAGE CLASS	DEPTH TO SEASONAL HIGH WATER-TABLE	DEPTH TO BEDROCK	MAJOR LIMITATIONS TO DEVELOPMENT (1)					
				EROSION POTENTIAL (2)	SHALLOW EXCAVATIONS	DWELLINGS WITHOUT BASEMENTS	DWELLINGS WITH BASEMENTS	LOCAL ROADS AND STREETS	OTHER FEATURES
EoB	Moderately well drained	1.5-3.0 ft	>6.0 ft	Moderate to high	Moderate-wetness	Severe-wetness	Severe-wetness	Severe-low strength frost action	-
MnB	Well drained	2-3.5 ft	>6.0 ft	Moderate	Moderate-wetness	Moderate-wetness	Moderate-wetness	Severe-low strength	-
SbA	Poorly drained	0-0.5 ft	>6.0 ft	Low	Severe wetness cut bank cave	Severe flooding, wetness	Severe flooding, wetness	Severe flooding, wetness, frost action	Wetland soil
Te	Well drained	>4.0 ft	>6.0 ft	High	Severe-slope slippage	Severe-slope slippage	Severe-slope slippage	Severe-slope slippage low strength	-
WvB	Excessively drained	>4.0 ft	>6.0 ft	High	Slight	Slight	Slight	Slight	-

(1) The first descriptive word is the degree of limitation, the following word(s) indicate the limiting factor, i.e. slope, high water table, flooding, etc.

Severe Limitations: indicates that one or more soil properties or site features are so unfavorable or difficult to overcome that a major increase in construction effort, special design, or intensive maintenance is required.

Moderate Limitations: indicates that the soil properties and site features are unfavorable for the specified use, but the limitations can be overcome or minimized by special planning and design.

Slight Limitations: indicates that soil properties are generally favorable for the specified use; any limitation is minor and can easily be overcome.

(2) High potential requires careful design of soil erosion and sediment control measures - usually structural measures needed.

Moderate potential requires careful design of control measures, involving both vegetative and structual measures.

Low potential requires minimum design, usually vegetative control measures.

EoB - Elmwood very fine sandy loam (3-8% slopes): This map unit is dominated by deep, moderately well-drained soils formed in a loamy mantle over clayey sediments devised mainly from Triassic rocks. Relief of this map unit is nearly level to moderately steep soils on terraces. The surface layer (A horizon, 0 to 6 inches) is typically very dark grayish brown fine sandy loam. The subsoil (B horizon, 6 to 25 inches) is dark yellowish brown, dark brown, and yellow brown, mottled, fine sand loam. The subsoil (C horizon, 25 to 60 inches) further below is olive brown, mottled, silty clay. Included with this soil in mapping are small areas of the poorly drained Scantic soils, and small areas of short steep slopes.

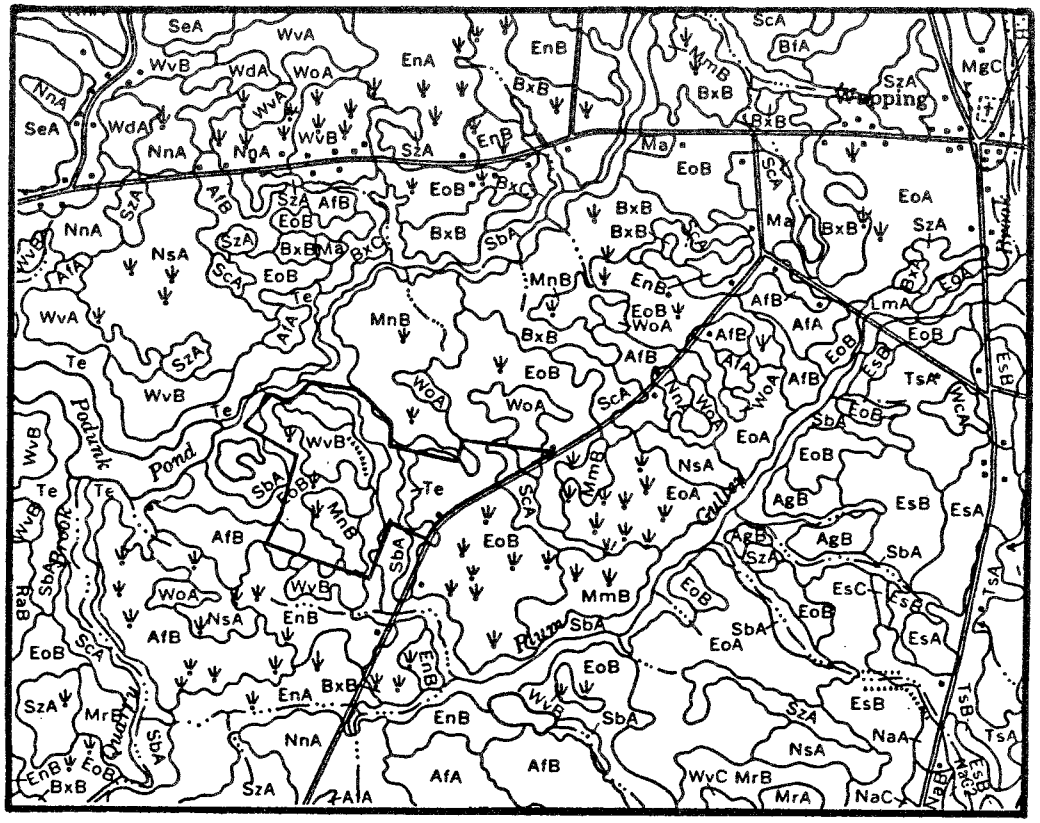
MoB - Melrose very fine sandy loam (3 to 8% slopes): This map unit is dominated by very deep, well-drained soils on glaciolacustrine marine or outwash plainsand deltas. This soil is formed in a loamy mantle 18 to 40 inches thick over clayey sediments. Slopes of this unit can range from 0 to 50 percent. The surface layer (A horizon, 0 to 7 inches) is very dark grayish brown, very fine sandy loam. The B horizon, 7 to 23 inches is typically yellowish brown fine sandy loam to sandy loam. The subsoil (C horizon, 23 to 60 inches) is light yellowish brown, olive to olive gray sandy loam to silty clay. Included with this soil in mapping are small areas of the moderately well-drained Elmwood soils and the poorly drained Scantic soils. Also included in mapping are small areas of short steep slopes.

SbA - Saco silt loam (0 to 3% slopes): This map unit is dominated by deep, very poorly drained soils on floodplains. They are formed in recently deposited alluvial material. This map unit receives frequent flooding for brief periods usually between the months of November to May. The surface layer (A horizon, 0 to 12 inches) is very dark gray silt loam. The subsoil (C horizon, 12 to 60 inches) is gray silt loam with stratified coarse sand and medium sand at 48 to 60 inches.

Te - Terrace Escarpments, sand and clay (25 to 50% slopes): This map unit is dominated by very deep, steep to very steep soils on the sideslopes of landforms. The soils are typically a loamy to sandy mantle over silts and clays. Included with this soil in mapping are small areas of soils on gentler slopes and areas of steep moderately well-drained soils.

WvB - Windsor loamy fine sand (3 to 8% slopes): This map unit is dominated by very deep, excessively drained soils on glaciofluvial landforms. They are formed in glacial outwash deposits of sands and loamy sands derived mainly from crystalline rocks. The top surface layer (A horizon, 0 to 2 inches) is very dark grayish brown loamy sand. The subsoil (B horizon, 2 to 24 inches) is typically strong brown, loamy sand to yellow-brown loamy sand to light yellow-brown sand. The C horizon (24 to 60 inches) is light brownish gray sand. Included with this soil in mapping are small areas of moderately well-drained soils and areas with steeper slopes.

SOIL SURVEY OF HARTFORD COUNTY, CONNECTICUT - SHEET NUMBER 27



MAP SYMBOLS

Soil delineations and soil symbols — CeA, FoB2

LAKES, PONDS, AND RESERVOIRS — water, W

ESCARPMENTS

Other than bedrock (points down slope)

Church

Farmstead, house

School

Streams, double-line

Perennial

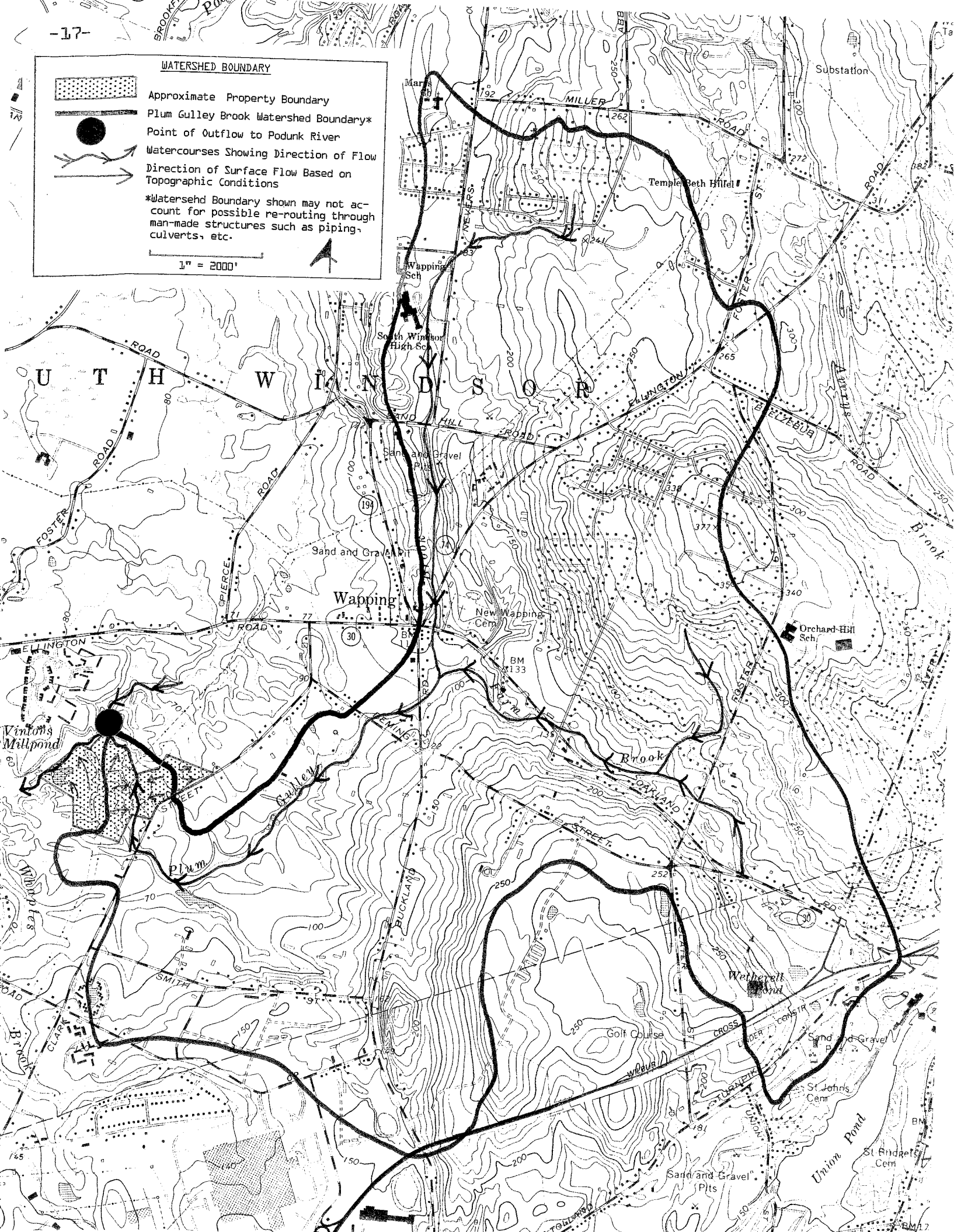
Streams, single-line

Perennial

Intermittent

Roads

Divided


WATERSHED BOUNDARY
Approximate Property Boundary
Plum Gulley Brook Watershed Boundary*
Point of Outflow to Podunk River
Watercourses Showing Direction of Flow
Direction of Surface Flow Based on Topographic Conditions
*Watersehd Boundary shown may not account for possible re-routing through man-made structures such as piping, culverts, etc.
1" = 2000'
SOUTH WINDSOR
Wapping
Substation
Temple Beth Hillel
South Windsor High Sch
Wapping Sch
Sand and Gravel Pits
Sand and Gravel Pit
New Wapping Cem
Orchard Hill Sch
Golf Course
Wethersfield Pond
Vinton's Millpond
Union Pond
St Johns Cem
St Andrews Cem
Sand and Gravel Pits
MILLER ROAD
FOSTER ROAD
ELLINGTON ROAD
SAND HILL ROAD
PIERCE ROAD
BUCKLAND ROAD
OAKLAND STREET
SMITH ROAD
CLARK ROAD
Plum Gulley Brook
Larrys Brook
Whipps Brook
BM 133
BM 112

VII. HYDROLOGY

The proposed development lies within the Podunk River drainage area. Plum Gulley Brook, which is a tributary to the Podunk River collects surface water from the central parts of the site. Surface water in the eastern limits drains to an unnamed tributary to the Podunk River.

Because of the sandy nature of the soils, covering most of the site, most rainfall is absorbed quickly into the ground rather than passing overland via streamcourses. It then percolates downward through the soil until it reaches the groundwater table. Once it reaches the groundwater table, it moves slowly by the force of gravity towards discharge points, i.e., wetlands, Podunk River, Plum Gulley Brook, etc.

Development of the site as planned would be expected to cause increases in the amount of runoff generated during periods of precipitation. These increases will arise primarily by the removal of vegetation and the covering of pervious soils by impervious surfaces such as roads, drives, roof tops, etc. Also, the proposed density of units on the site will be quite high.

A storm drainage proposal for the development and drainage calculations have not been prepared to date. As a matter of policy, the developer should be required to provide a stormwater management plan, which includes pre- and post-development runoff calculations. The plan should make provisions for controlling runoff from the site in order to prevent erosion problems, especially in view of the fine, sandy soils on the site. Providing good construction practices are employed and a detailed sediment and erosion control plan is implemented and enforced, the hydrologic and geologic impacts during construction can be kept to a minimum.

Based on the site plan distributed to Team members on the review day, about 300 feet of Plum Gulley Brook and its accompanying floodplain will be crossed by an interior road.

Wetland road crossings are feasible, provided that they are properly engineered. Provisions should be made for removing unstable material beneath the roadbed, backfilling with a permeable road base fill material, and installing culverts as necessary. When crossing any wetlands, the roads should be at least 1.5 feet and preferably two (2) feet above the surface elevation of wetlands. This will allow for better drainage of the roads. It will also decrease the frost heaving potential of the road. Road construction through wetlands should preferably be done during the dry time of the year and should include provisions for effective erosion and sediment control.

The project engineer has suggested the use of pre-cast arch-type culverts. Provided the culverts are sized adequately, these culverts should not cause serious adverse impact on Plum Gulley Brook. Nevertheless, the stream bottom and sides should be riprapped at the culvert ends to prevent erosion. In order to maintain roads at acceptable grade, especially at the stream crossing, it will be necessary to do some cutting and filling. Measures for effective erosion and sediment control will need to be considered in these areas, also.

VIII. WATER RESOURCES

The following are findings and recommendations relative to impacts upon inland wetlands and watercourses.

1.) The roadway crossing over Plum Gulley Brook appears to be in the most suitable location available to the developer. It appears that efforts have been taken to minimize the impact of the roadway crossing. The precast concrete arches will serve to maintain a relatively "open" character to the stream corridor and, if properly designed, will provide an adequate passage for wildlife and fish.

2.) The small isolated wetland pockets located in the western portion of the site provide an opportunity for creation of small aesthetic pond features. However, careful analysis of the groundwater regime in this area is essential to ensure that the ponds can maintain an attractive water level year round. Rather than create ponding areas, these outlying wetlands can often be enhanced by selective pruning of brush and planting moisture tolerant wildlife and ornamental species. They may then serve as attractive visual buffer areas on the site while maintaining certain desirable wetland functions.

3.) Creation of a larger pond in wetlands is proposed in the eastern portion of the site adjacent to Clark Street. Again careful analysis of water tables (or the soil profile) would be necessary to assure that the ponded area will sustain a reasonable amount of water during dry seasons. Test pit observations during the summer months or placement of shallow monitoring wells (4" perforated PVC pipe) can be useful for this purpose. Should inadequate persistent watertables be present, treatment of the perimeter of the wetland as prescribed above may be a desirable alternative.

4.) By implementation of proper erosion and sedimentation controls and storm water management techniques, there should be no lasting negative impact on water quality of adjacent watercourses and waterbodies. The site offers opportunities for storm water recharge and detention which would serve to mitigate runoff increases. Landscape development which allows for maintenance of buffer areas adjacent to wetlands and stream corridors is advisable. Maintaining minimum lawn areas and careful use of fertilizers and pesticides (while difficult to legislate) would be prudent and could be over seen by the future homeowners association.

IX. VEGETATION

Type A: Old Field. 14 acres. This area is reverting to a mixed hardwood forest, but at present is an understocked stand of seedling-sapling maple, apple, black cherry, red cedar, aspen, white pine, sumac, dogwoods, viburnums, multiflora rose, blueberry, poison ivy.

Type B: Mixed Hardwood. 12 acres. This type is located around the parcel in patches 1 to 6 acres in size. The trees in the type range in size from sapling to sawtimber and represent a variety of age classes as well as sizes. Species include: red, black, scarlet, white oaks, red maple, black cherry, butternut, shagbark, pignut, mockernut hickories, and white pine.

Type C: Hardwood swamp. 12 acres. These wetlands are composed of speckled alder, willow, red maple, grasses, sedge, and cattails.

Type D: Field. 9 acres. The recently abandoned corn and hayfields are presently occupied by golden rod, thistle, fleabane- jewelweed, poison ivy, multiflora rose, sumac and a wide variety of grasses and wildflowers.

See Vegetation map for locations.

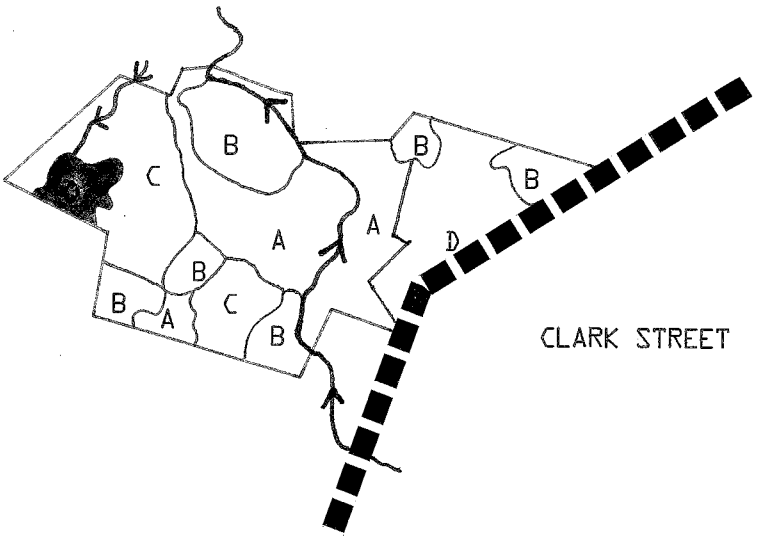
Limiting Conditions and Potential Hazards

Trees are very sensitive to the condition of the soil under their crowns, and within the area of soils which their roots occupy. Development practices near trees such as excavation, filling and grading for construction of roadways and buildings will disturb the balance between soil aeration, soil moisture level, and soil composition. These disturbances can cause a decline in tree health and vigor resulting in tree mortality in 3--5 years. Mechanical injury to trees from machinery can have the same results. Dead trees near homes, powerlines and roads reduce aesthetic quality and become hazardous and expensive to remove. Care should be taken during construction not to disturb trees and soil conditions around tree roots. In general, favor healthy and high vigor trees for protection over unhealthy trees. Healthy trees are generally more resistant to environmental stresses brought about by construction. Where possible retain trees in small groups or "islands". This practice lowers the possibility of soil disturbance and mechanical injury. To retain individual trees, clearly mark the tree to be avoided and the entire area under the crown of larger trees or a radius of at least 25 feet from the base of smaller trees. The cutting and removal of understory vegetation in the "islands" will create a park-like appearance.

Many of the trees present in the mixed hardwood stands are low in quality and exhibit poor form. These trees are a potential hazard if not removed prior to development especially if left on the edge of an "island" or near a street or home. Windthrow is a potential hazard near wet soils or when trees grow up together and rely on each other for stability. If openings are created for building the sudden exposure to wind without side protection of other trees can result in blowdown or crown breakage. Trees which have had roots cut or filled over near homes represent a blowdown hazard or breakage hazard from lack of stability or die back. Trees damaged in construction are also more susceptible to insect and disease infestation. All trees removed by clearing can be utilized as fuelwood.

Alterations in wetland areas which permanently raise the watertable by restricting natural drainage and stream flow can have a negative impact on the vegetation in these areas. Raising the watertable can drown roots causing widespread mortality in the trees, shrubs and herbaceous vegetation present in all vegetative types. The impact to vegetation created by construction of the proposed wetland crossing will be minimal providing that culverts are adequately sized and properly spaced.

VEGETATION



TYPE A : Old field, 14 acres, understocked seedling-sapling mixed hardwoods, shrubs, herbaceous

TYPE B : Mixed hardwood, 12 acres, fully-stocked, all size classes

TYPE C : Hardwood swamp, 12 acres

TYPE D : Field, 9 acres

 : Water

 : Stream

——— : Site boundary

——— : Type boundary

SCALE : 1" = 1000'

X. FISH RESOURCES

The proposed cluster development involves the Podunk River, Plum Gulley Brook and Vintons Mill Pond. The Podunk River and Vintons Mill Pond are on the outskirts of the proposed development site. Plum Gulley Brook runs through the property.

Plum Gulley Brook has a silt and sand bottom with a very slight gradient. It is 4 to 6 feet wide and has sufficient streamside vegetation providing shade and cover for the fish populations.

White sucker, brook trout and blacknose dace presently inhabit the brook.

The proposed development plan limits construction to areas higher than the 68 foot elevation. This limitation will provide a sufficient buffer zone between the watercourses and development, protecting the fish resources.

Plum Gulley Brook is the site for the proposed bridge. The bridge should be constructed prior to any activity on the west side of the brook. The stream channel should not be disturbed and, therefore, should flow through one of the 20 foot arches. The other 20 foot arch will accommodate floodwater.

The impact of development on the brook can be minimized by implementing proper erosion and sedimentation structures and limiting bridge construction to time of minimum stream flow in the summer or fall.

XI. WILDLIFE RESOURCES

Wildlife Considerations

Wetlands habitat is of concern because of its sensitivity to development. They are also very important to man because they act as water storage and absorption areas as well as helping to prevent flooding. Development in wetland areas is usually limited due to poorly drained soils.

Because of diversity, the area now provides good habitat for many forms of wildlife. The variety of vegetation types provides food and cover for many species such as white-tailed deer, ruffed grouse, woodcock, seasonal songbirds, woodpecker, gray squirrel, raccoon and fox.

Wetland habitat provides a rich variety of food, cover, nesting and brood-rearing sites for a great number of wildlife species. They provide breeding and nesting sites for waterfowl, and habitat for more than 50 species of game and non-game species including beaver, fox, mink, muskrat, opossum, white-tailed deer, and snowshoe hare.

Wildlife Recommendations

Almost all housing developments and the proposed development of this area will have a negative impact on much of the habitat presently available for wildlife. Some species will be forced to move to new areas where there is adequate food and cover. However, certain wildlife species which are more adaptable such as raccoons, skunks, gray squirrels and mice may be attracted to the area after development.

The following recommendations may help to lessen the impact on wildlife:

1.) Wetland habitat

As proposed, the wetland area should remain undeveloped. Also, a buffer area of uncut vegetation should be left in close proximity to the area delineated as wetland habitat.

2.) Clearing

When clearing try to leave as many trees and shrubs as possible. Species especially useful to wildlife include:

white oak (Quercus alba)
red oak (Quercus rubra)
black cherry (Prunus serotina)
quaking aspen (Populus tremuloides)
red-stemmed dogwood (Cornus stolonifera)
apple (Malus Spp)

This will be beneficial to wildlife and also be more aesthetically pleasing for homeowners.

Also, try to leave as many snags (standing dead or dying trees) and den trees (trees with holes) as possible. These trees are used by insect-eating birds and cavity-nesting birds and animals.

3.) Landscaping

When landscaping this area plant trees and shrubs which are useful to wildlife. These include:

Japanese barberry (Bergeris bulgaris)
American mountain ash (Sorbus Americana)
flowering dogwood (Cornus florida)
autumn olive (Elaegnus umbellata)
honeysuckle (Lonicera spp.)
winterberry (Ilex verticillata)
juniper (Juniperus spp.)
American cranberry bush (Viburnum trilobum)
bayberry (Myrica pensylvanica)
red maple (Acer rubrum)
red-osier dogwood (Cornus stolonifera)
chokecherry (Prunus virginiana)
maple-leaved birburnum (Biburnum acerifolium)
alternate leaf dogwood (Cornus stolonifera)
American holly (Ilex opaca)

XII. PLANNING CONCERNS

Three (3) major concerns related to planning are recognized and discussed below:

1.) From an environmental standpoint can the site physically sustain the type of development proposed?

2.) Is the proposed cluster development aesthically appropriate for the site?

3.) Is the development compatible with surrounding land uses and will it cause any particular conflicts?

After walking the site it is the opinion of the Team Planner that the major environmental concerns would be the project's impact on wetland or stream areas. The intent of the design for the project is to keep disturbances of these environmentally sensitive areas at a minimum. The proposal calls for no major construction to occur below the 68 foot contour with the exception of the bridging over the Plum Gulley Brook at one point to accommodate access to the western portion of the site. An arch system with two (2) 20 foot openings, one to accommodate the normal course of the stream and the other to handle floodwaters, are proposed. If properly installed the arch system should not cause undue erosion and sedimentation problems, nor will it significantly impede the flow of the Plum Gulley Brook. At the stream crossing the access drive has wisely been designed to follow the crowns of ridgelines on both sides of Plum Gulley Brook thereby not interfering with drainage patterns to the brook. As has been noted by the Project Engineer it will be important to direct storm water runoff off the pavement to avoid having it flow directly to the low point of the bridge at high velocity. Sloping the pavement to one side of the drive and providing swales (as necessary) on the shoulders should allow storm water to adequately be accommodated in the area of the bridge.

Another area of environmental concern is the proposed pond in the northeast corner of the site. Creation of a pond has been proposed for a swampy area surrounded by thick brush and wooded areas. During the site visit it was observed that this area was practically dry at the surface with very little water flowing into it--through a culvert beneath Clark Street. Considerable excavation would be required to construct an aesthetically pleasing pond. Also, it would very likely be necessary to periodically pump water into the pond to maintain an adequate water level and to offset water loss through evaporation. The development of a pond would aesthetically improve the site and would create a healthier environment for residences in that portion of the site. As the design of this project advances the extent of excavation required should be detailed as well as determination of whether or not an adequate water level can be maintained without excessive pumping of water into the pond.

The concept of cluster design provides the opportunity of taking greatest advantage of scenic attributes offered by the site. Clustering the homes on the high ground of the site will provide filtered views through the trees of Plum Gulley Brook and other low lying areas which will be forever left in a natural state.

Certainly a major advantage of cluster development is that much less land will have to be cleared of vegetation. Also, the project's architect and engineer intend to leave as many trees as possible to envelope the homes and allow them to blend in with their natural setting. The access drive to the site has been laid out in curvilinear fashion with four (4) cul-de-sacs. Because of the rolling topography and varied vegetation, views along the drive should be interesting. Accommodating 69 units as the proposal suggests may present problems in trying to choose optimal siting locations and leaving a maximum number of trees. In comparing the proposed site plan to the MDC topographic map the Planner's conclusion is that it would not be feasible to fit 69 units without allowing construction to occur below the 68 foot contour. A modest reduction in the amount of units proposed would ameliorate this problem.

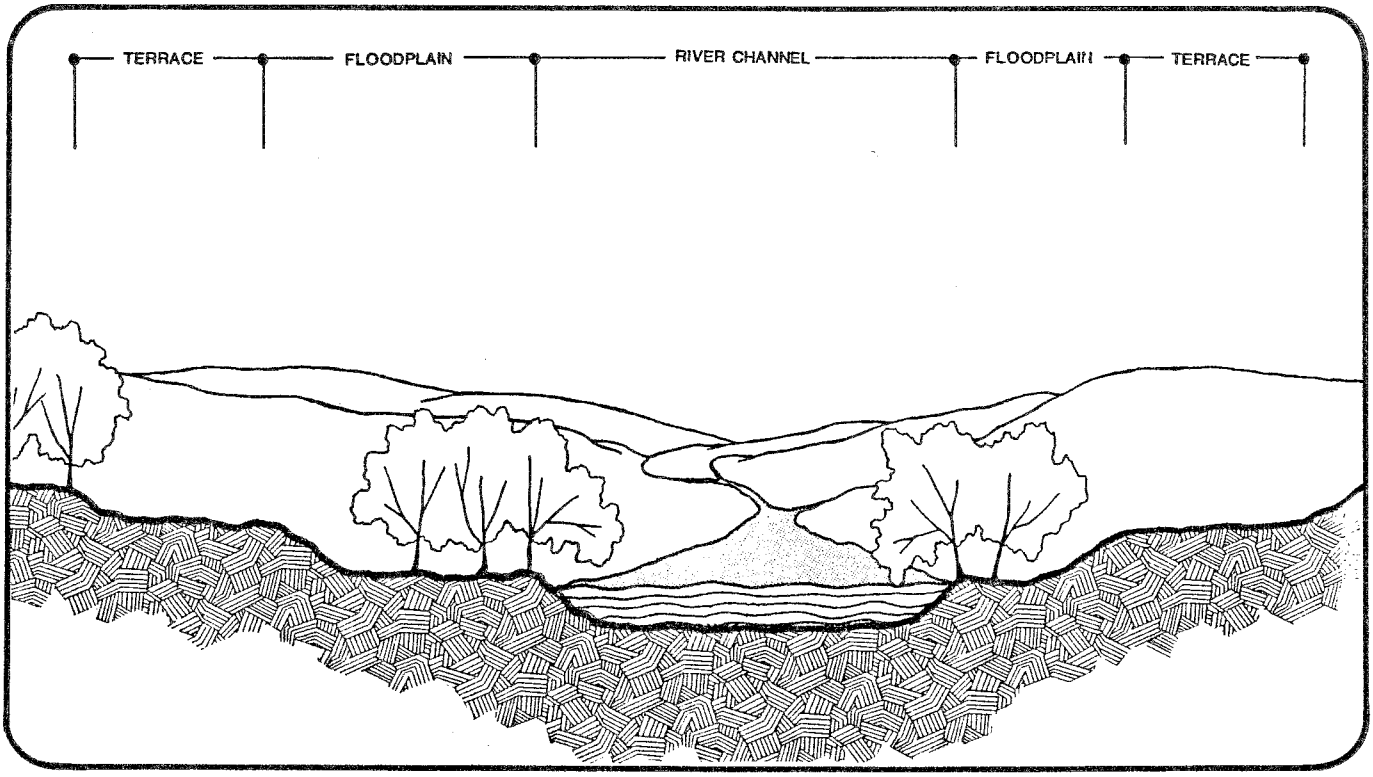
During the site visit, it was recognized that maintaining adequate screening of the power line right-of-way should be a major concern in creating an aesthetically pleasing project. As site planning proceeds special care should be taken to maintain ample tree cover to screen views of the power lines from homes which will be sited along the two (2) cul-de-sacs proposed to parallel the lines.

For the most part, the proposed cluster development is compatible with surrounding land uses. The physical configuration of the site provides a natural separation from the adjacent Open Space subdivison. Also, only filtered views of units located in the eastern portion of the site will be visible from the large lot residences along Clark Street. No conflicts are evident with lands to the north or west of the site which are either undeveloped or publically controlled open space. Wooded areas will screen most of the development from surrounding lands minimizing the visual impact on the area.

Two (2) potential off-site conflicts which will be briefly mentioned are: storm water runoff and increased automobile traffic. Since the proposed development sits at the lower end of the watershed of the Plum Gulley Brook, a question arises as to whether storm water should be detained or allowed to exit the watershed as directly as possible without causing erosion. Since over most of the site, storm water runoff will not be entering the Plum Gulley Brook directly from impervious surfaces; it would be most logical not to require extensive storm water detention features. The natural ability of forested areas to slow the velocity of runoff should be capitalized upon.

A potential traffic problem exists at the point where the access drive will intersect Clark Street. As the design process proceeds it will be important to assure adequate distance between the intersection and the point where Clark Street bends sharply. The proposed site plan appears to allow enough distance at 480 feet, but it will be important to assure that vegetation does not interfere with site lines at the intersection. A suggestion would be to have the developer provide a paved shoulder or access lane on the right side (toward the curve) of the intersection to provide a smoother transition in Clark Street without impeding thru-traffic.

Overall, the concept of the design seems to fit the natural character of the site and few functional problems in accommodating the construction seem to be evident. As the design process proceeds with the scrutiny of Town Planning Officials, the cluster proposal for the site should develop into a fine housing project.



XIII. SUMMARY

NOTE: This is a brief summary of the major points, concerns and recommendations of the Team. You are strongly urged to read the entire report, and to refer back to the specific sections in order to obtain all the information about a certain topic. {The numbers in parentheses refer to the section of the report where further information may be found.}

- It is important to note that the assessments of impacts of the proposed development are limited due to the preliminary nature of the plans. {I, V}

- Bedrock should pose no major problems in terms of the proposed development because of its great depth. {II}

- The alluvial soils present on the site hold low potential for development. The soils which constitute the upland portions of the site should not be a problem especially since public water and sewer lines are available. {III}

- There is concern for the installation of sewers, water lines and electric lines because of the possibility of "cutback cave-ins" in the upland soils. {IV, VI}

- Running sewer lines across drainage ways is another area of concern. {IV}

- It may be prudent to take soil borings of the lake deposits present to determine their ability to support foundations and pre-fabricated bridge structures. {IV}

- A certified soil scientist should flag in the field the wetland and floodplain boundaries and these should be superimposed on the plans. {IV, V}

- Any activity in alluvial soils which involves filling or modifying wetland areas requires a permit from the Town. {IV}

- Building in wetland areas should be avoided. {V}

- A carefully designed and implemented Soil and Erosion Control Plan is necessary to ensure protection of on and off-site resources. {V}

- It is suggested that all storm water detention basins be constructed out of the 100 year floodplain and wetlands. {V, XII}

- The development should be phased to aid in reducing negative impacts. {V}

- The small depressional wet areas near the transmission power lines could be considered for filling. {V, VIII}

- Some planning consideration should be given to access, maintainance and screening of the power transmission lines. {V, XII}

- Careful site planning and layout will be necessary in order to save existing trees. {V, XII}

- The major limiting factors of soils at this site are steep to very steep slopes, highly erodible soils and seasonal high water tables. {VI}

- A storm water management plan should be required that provides pre- and post-development runoff calculations. {VII}

- The use of pre-cast arch-type culverts should not cause serious adverse impact on Plum Gulley Brook. As a precaution the stream bottom and sides should be riprapped at the culvert ends to prevent erosion. {VII, X, XII}

- The roadway crossing of Plum Gulley Brook appears to be in the most suitable location available to the developer. {VIII, XII}

- The small isolated wetland pockets provide an opportunity to create small aesthetic pond features. Careful analysis of the groundwater regime will be necessary to determine if the ponds can maintain an attractive water level year round. Rather than creating ponding areas these wetlands could be enhanced by pruning and planting wildlife and ornamental species. They would then serve as a visual buffer while maintaining certain desirable wetland functions. {VIII, V}

- Careful analysis of the water tables for the soil profile would be necessary to determine if the creation of a large pond adjacent to Clark Street is feasible. {VIII, XII}

- Many of the trees present in the mixed hardwood stands are low in quality and exhibit poor form. These trees are a potential hazard if not removed prior to development. {IX}

- The impact to vegetation from the construction of the wetland crossing will be minimal providing that culverts are adequately sized and properly spaced. {IX}

- A sufficient buffer to protect the fish resources will be maintained between the watercourse and the development provided that construction is limited to areas higher than the 68 foot elevation. {X}

- The bridge across Plum Gulley Brook, should be constructed before any activity takes place on the west side of the brook. {X, V}

- Bridge construction should be limited to time of minimum stream flow in the summer or fall. {X}

- The proposed development will have a negative impact on much of the habitat presently available for wildlife. There are several recommendations to lessen this impact concerning wetland habitat, clearing and landscaping. {XI}

- It does not seem feasible to fit 69 units without allowing construction to occur below the 68 foot contour. A modest reduction in the amount of units proposed should suffice. {XII}

- For the most part the proposed development is compatible with surrounding land uses. {XII}

- It seems most logical not to require extensive storm water detention features, but to allow the natural ability of the forested areas to slow the velocity of runoff. {XII, V}

- The access drive will need to be carefully designed to assure adequate distance between the intersection and the point where Clark Street bends sharply. {XII}

- It is suggested that the developer provide a paved shoulder or access lane on the right side {toward the curve} of the intersection to provide a smoother transition in Clark Street. {XII}

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--an 86 town 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, a statement identifying the specific areas of concern the Team should address, and the time available for completion of the ERT study. 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 Elaine A. Sych (774-1253), Environmental Review Team Coordinator, Eastern Connecticut RC&D Area, P.O. Box 198, Brooklyn, Connecticut 06234.