Inwood Forest Subdivision

Coventry Connecticut

February 1990

EASTERN CONNECTICUT ENVIRONMENTAL REVIEW TEAM REPORT

Eastern Connecticut Resource Conservation and Development Area, Inc.

Inwood Forest Subdivision

Coventry, Connecticut

Review Date: Janaury 11, 1990

Report Date: February 1990

Eastern Connecticut Environmental Review Team
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ENVIRONMENTAL REVIEW TEAM REPORT
ON

INWOOD FOREST CLUSTER SUBDIVISION

COVENTRY , CONNECTICUT

This report is an outgrowth of a request from Coventry Planning and Zoning Commission to the Tolland County Soil and Water Conservation District (SWCD). The S&WCD referred this request to the Eastern Connecticut Resource Conservation and Development (RC&D) Area Executive Council 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 Thursday, January 11, 1990. Team members participating on this review included:

Nick Bellantoni	**State Archaeologist** **CT Museum of Natural History**
Barbara Buddington	**Regional Planner** **Windham Regional Planning Agency**
Joyce Purcell	**District Conservationist** **USDA - Soil Conservation Service**
Elaine Sych	**ERT Coordinator** **Eastern CT RC&D Area, Inc.**
Bill Warzecha	**Geologist/Sanitarian** **DEP - Natural Resources Center**

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, and a soils map. During the field review the Team members were given preliminary plans. The Team met with, and were accompanied by the Town Planner and a respresentative of the developer. 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 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 Council hopes you will find this report of value and assistance in making your decisions on this proposed cluster subdivision.

If you require additional information, please contact:

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The site, 95.23 acres in size, is located on top of Riley Mountain in east-central Coventry. It is bounded on the north, east, south and west by private, undeveloped land that is wooded. Primary access to the subdivision site will be made available via Riley Mountain Road. The latter road is characterized by low density residential land uses. At its closest point, the irregularly shaped tract of land is about 500 feet from Connecticut Route 44. A high tension power line (Hartford Electric Company) traverses open space parcel "C" in the southwest corner of the site in a northwest-southeast direction. The utility manages a ±125' wide easement to prevent tree growth and maintain access for maintenance vehicles.

Town officials indicated during the pre-review meeting that the site is located in a RU-40 zone, which allows single-family residences on lots of at least 40,000 square feet. However, the applicant wishes to utilize the town's modified cluster development regulation on the site. The purpose of this design concept, which will require a formal change of zoning classification from RU-40 is to encourage preservation of natural and/or environmentally sensitive areas.

The proposed project calls for the subdivision of a wooded site into 71 residential lots. Forty-two out of the 71 lots proposed (60%) are under 40,000 square feet or about 1 acre in size. Each lot would be served by individual on-site septic systems and wells. Access to the lots would be accomplished by the construction of a switchback road that cul-de-sacs in the northwest corner. Approximately 525 feet of road at the beginning will be a boulevard.

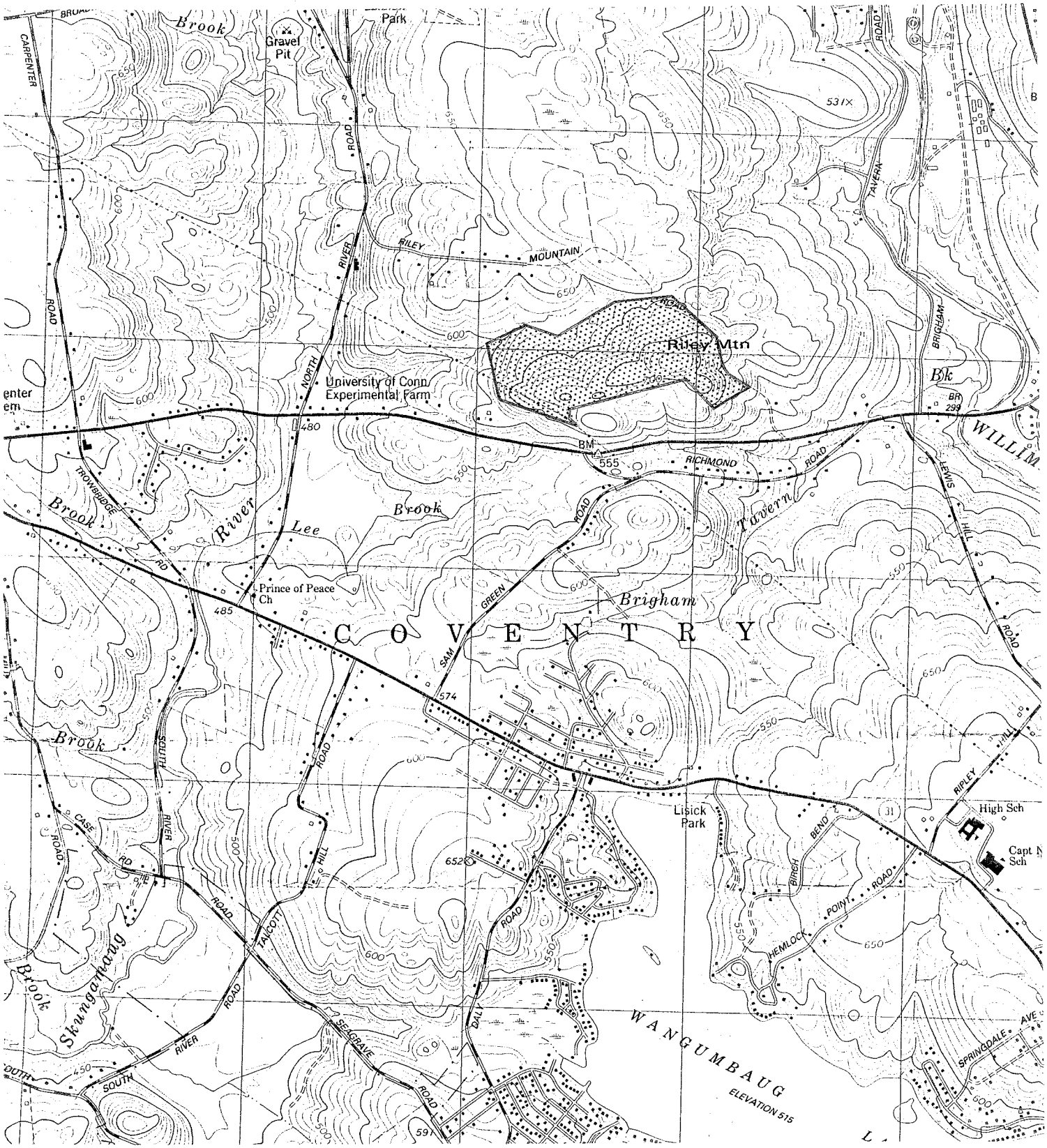
A total of 18.3 acres or about 20% of the site comprises open space land. Access to open space parcel "A" is unknown, but appears to be limited. Additionally, steep slopes characterize 37% or 5.4 acres of this site. About 30% of open space parcel "B" contains regulated wetlands, of which 1.5 acres would support the proposed detention basin for the project. Approximately 40% or 3 acres of open space parcel "C" comprise the HELCO overhead high tension line right-of-way for the project.

Regulated wetlands along the northern border of the parcel under the present plans indicate that wetland crossings by road or driveways will not be required.

LOCATION MAP

Scale 1" = 2000'

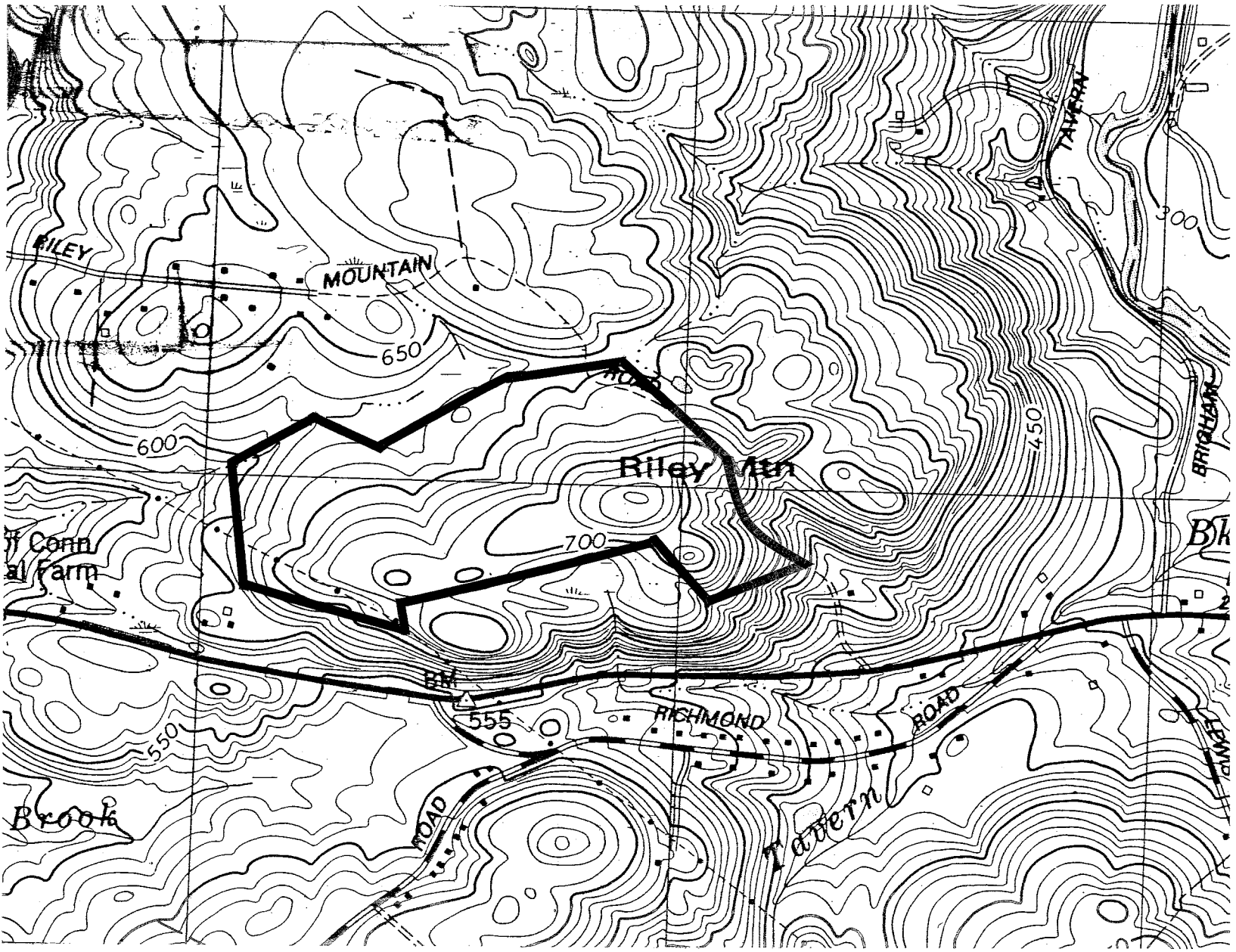
Approximate Site



TOPOGRAPHIC MAP

Scale 1" = 1000'

Approximate Site Boundary



2. Topography

The site is located on Riley Mountain, a rock-cored hill whose main axis trends in an east-west direction. The site topography consists of gentle to very steep slopes. The site's steepest slopes are concentrated in the southeast corner where solid bedrock is exposed at ground surface. Gentle slopes occur on the tableland of Riley Mountain. The remainder of the site is characterized by moderate slopes. Maximum and minimum elevations on the site are 740 feet above mean sea level and 590 feet above mean sea level, respectively.

Except for two areas, the proposed interior road has been laid out to cross slopes and conform to contours rather than perpendicular. This should help to minimize the chances for "cut" areas. Of the two road segments that are proposed to be perpendicular to the contours, only one (near the HELCO right-of-way in the western parts) will encounter slopes which are moderate and which may require cuts and fills.

3. Geology

Neither surficial or bedrock geologic mapping data has been published for the South Coventry topographic quadrangle. Nevertheless, unpublished geologic data available at the Department of Environmental Protection's Natural Resource Center in Hartford was reviewed for this section of the report. Also, referenced was the Bedrock Geological Map of Connecticut, John Rodgers, 1985 and the Soil Survey for Tolland County, Connecticut.

Bedrock Geology

According to Rodgers (1985), the rock core of Riley Hill is identified as the Hebron Gneiss and consists of interlayered dark-gray, locally rusty, fine to medium-grained calc-silicate gneiss. This rock unit underlies most of the northern parts of Coventry.

Except for the homes served by several small water companies that are scattered throughout Coventry, the bedrock aquifer is the principal water supply source for domestic purposes. Present plans indicate that each lot would be served by drilled bedrock wells.

On site test hole work for subsurface sewage disposal exploration has demonstrated that depth to bedrock exceeds 6 feet in 72 of 86 test holes excavated on the site. Fourteen test holes encountered bedrock at depths ranging between 2.5 feet to 6 feet. The greatest concentration of holes with shallow to bedrock conditions occur at the top of Riley Mountain in the eastern parts. This condition will be an important design constraint with respect to on-

site sewage disposal. For this reason, careful examination of subsurface conditions is warranted in this area.

Surficial Geology

A glacial sediment called till covers the entire site. It consists of a brown to grayish-brown mixture of rock particles and fragments that range in size from clay to boulders, but primarily contains sand and silt. The till sediments were deposited directly by glacial ice onto the bedrock surface without much reworking by glacial meltwater streams.

According to the Soil Survey for Tolland County, Connecticut, the texture of most of the till derived from soils on the site are sandy, stony and loose. Deep test hole data indicates, however, that a compact soil zone generally 2'- 4' deep, occurs throughout the site. The compact soil zone is usually characterized by finer-grained particles (silt and fine sand), and lower permeabilities. As a result, it impedes the downward movement of groundwater that may cause a seasonally high water table condition. As a precautionary measure, it would be wise to protect homes with building foot drains. They will hopefully keep basements dry. Building foot drains can be outletted to the storm drainage system or, where topography allows, "daylighted" to the ground surface. However, because lots will only be about one acre in size and served by on-site septic systems and wells, it would be preferable to discharge the building foot drain water to the road drainage system. This will, hopefully, prevent water problems onto neighboring properties, potential interference with septic systems and minimize the risk of water quality problems to neighboring wells.

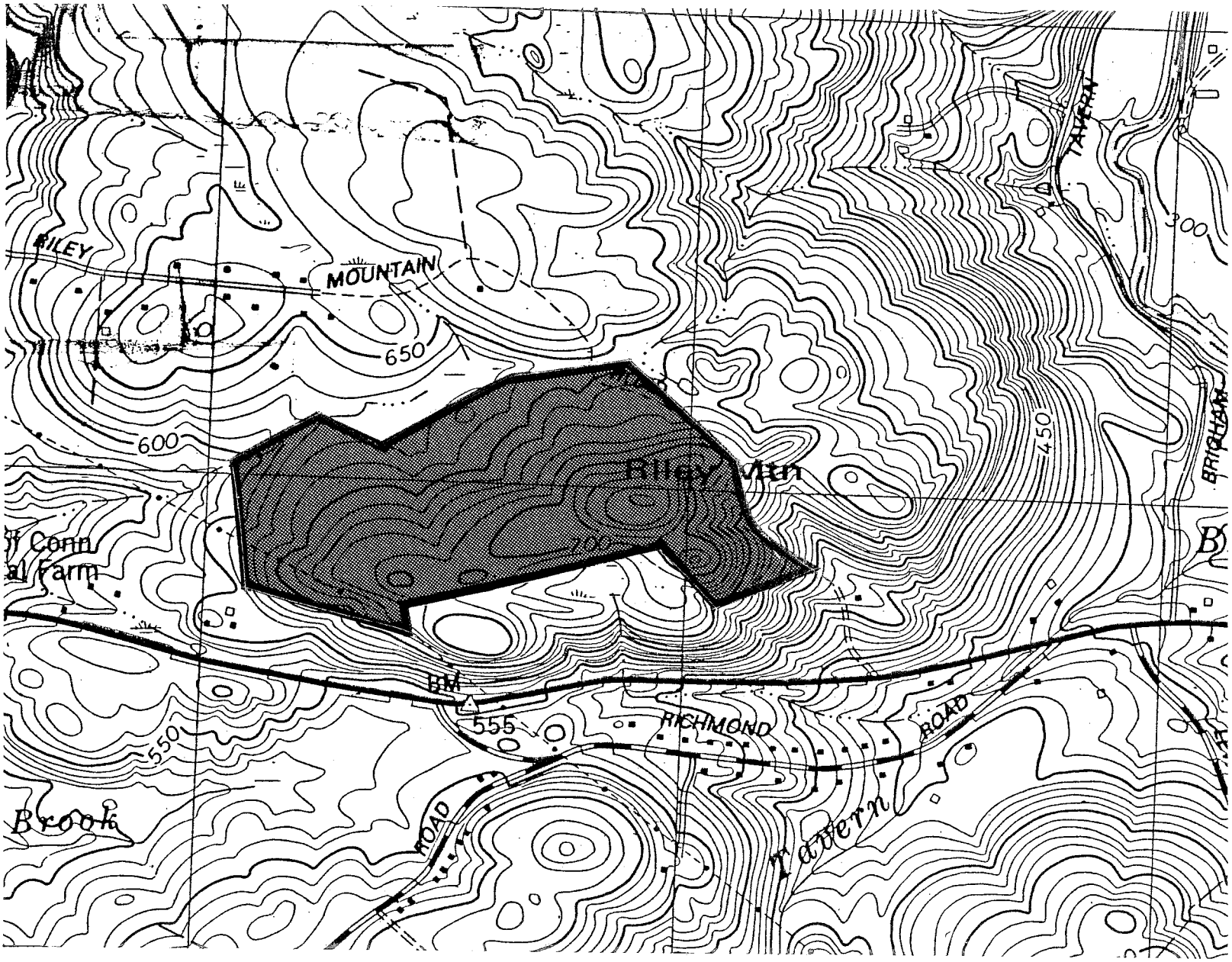
Based on deep test hole data, the thickness of the till on the site varies greatly, 2.5 feet to 19 feet. It is thickest on the northern parts of the site and thinnest in the southeast corner of the site.

GEOLOGIC MAP

Scale 1" = 1000'

Till

Note: Entire site is underlain by Hebron Gneiss



4. Soil Resources

General Soils Information

The information contained in the Soil Survey for Tolland County, CT appears to be adequate for planning purposes. Basic interpretive information for the following map units are given at the end of this section of the report. They are CrC, GeC, HrC, HrE, and Lg. If the commission requires additional information it is suggested that the applicant obtain the services of a qualified private soil scientist to review the information contained in the soil survey of Tolland County, CT, examine conditions in the field and provide the commission with a verified map and more detailed interpretive information for the site.

Wetland Boundary Information

Wetlands on this site were identified in the field by a soil scientist, however station numbers were not shown on the plan map. The District suggests that the commission require the applicant to provide for review a pian map with the field delineated boundaries and station numbers shown. The soil scientist who performs this field work should then review and sign a statement on the map(s) certifying that the information is substantially correct. The certification statement should be similar to the following:

> "The wetland soils on this site were identified in the field using the criteria required by Connecticut P.A. 72-155 as amended by Connecticut P.A. 73-571, Connecticut P.A. 87-338 and P.A. 87-533. The boundaries of these soils and of identified watercourses are accurately represented on the plot plan."

This statement should then be signed by the soil scientist who performed the field work.

The Commission and/or appropriate staff should then arrange to meet with the applicant and the soil scientist to review these boundaries in the field and compare field conditions to the information submitted, especially in areas where alterations to the wetlands, detention basins and stormwater discharges are proposed. If this procedure is followed and discrepancies are found theTolland County Soil and Water Conservation District can on request review the submitted information for adequacy.

Soil Erosion and Sediment Control Plan

A detailed soil erosion and sediment control plan should be developed and implemented for this site. The plan should be developed

using the criteria contained in the Connecticut Guidelines for Soil Erosion and Sediment Control (1985). A detailed narrative noting the sequence of activities and installation of measures proposed should be developed for the site. Areas of concern include steep slopes, proximity to wetlands, stormwater discharges into wetlands, the proposed detention basin in the wetland and stabilization of potential cuts and fills that may be required to facilitate the road network. The Commission may also want to require the following (or similar) statements on the plan which relate to implementation and inspection of the soil erosion and sediment control plan:

1. "The contractor shall secure the services of a certified professional soil erosion and sediment control specialist or professional engineer who shall verify in the field that the controls required by this plan are properly installed, shall make inspection of such facilities not less frequently than weekly and within forty-eight (48) hours of any significant rainfall, and shall by written report, inform the owner or his agent not less frequently than weekly and the Town Planning and Zoning Commission not less frequently than monthly of observations, maintenance, and corrective activities undertaken. An approved checklist may be used to document the inspection findings."

2. "There shall be a pre-construction meeting with the Town soil erosion and sediment control agent, the Town wetland agent, the contractor and the contractor's professional soil erosion and sediment control specialist to discuss the plan and inspection and report requirements."

The Tolland County Soil and Water Conservation District would appreciate the opportunity to review this plan prior to final approval.

Other

A hydrologic review and summary were not avaialable for Team review. It is suggested that these be prepared and submitted with the final proposal for the development. Stormwater managment should be addressed using the criteria prepared by the Tolland County Soil and Water Conservation District in their Model Runoff Mangement Systems Regulations - May 1989. Design of the proposed detention basin shall be in accordance with the Detention Basin (DB) standard contained in the Connecticut Guidelines for Soil Erosion and Sediment Control (1985). A plan of operation and maintenance shall be prepared for use by the owner, or others responsible for the system, to ensure that each component functions properly.

It is the applicants responsibility to obtain all necessary permits from the Army Corps of Engineers in addition to local Inland Wetland Commission approval.

SOILS MAP

Scale 1" = 1320'

——— Approximate Site Boundary

SOILS DESCRIPTIONS

Soils for Inwood Subdivision
Riley Mountain Road
Coventry, CT
Soil Map #35 from "Soil Survey-Tolland County, CT, SCS (1966)"

CrC - Canton and Charlton soils, 3 to 15 percent slopes, extremely stony

This mapping unit consists of gently sloping to sloping, well drained soils on ridges, hills, and side slopes of glacial till uplands. The areas are oval or irregular in shape. Slopes are mostly smooth and convex and are 100 to 600 feet long. Stones cover 8 to 25 percent of the surface. About 45 percent of this unit is Canton soils, 40 percent is Charlton soils, and 15 percent is other soils. Some areas of this unit consist almost entirely of Canton soils, some almost entirely of Charlton soils, and some of both. The soils were mapped together because they have no significant differences in use and management.

Typically, the Canton soils have a surface layer of very dark grayish brown fine sandy loam 2 inches thick. The subsoil is yellowish brown fine sandy loam, gravelly fine sandy loam, and gravelly sandy loam 21 inches thick. The substratum is pale brown gravelly loamy sand to a depth of 60 inches or more.

Typically, the Charlton soils have a surface layer of dark yellowish brown fine sandy loam 5 inches thick. The subsoil is yellowish brown fine sandy loam and sandy loam 20 inches thick. The substratum is light yellowish brown and light brownish gray sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of somewhat excessively drained Gloucester and Hollis soils, well drained Paxton soils, and moderately well drained Sutton soils. Also included are a few nearly level areas and a few areas that have a compact substratum at a depth of 40 to 50 inches.

The water table in these Canton and Charlton soils is commonly at a depth of more than 6 feet. The permeability of the Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. The permeability of the Charlton soils is moderately rapid. Both soils have moderate available water capacity and medium to rapid runoff.

Slope is the main limitation of these soils for community development, especially for onsite septic systems. Slopes of excavations in these soils are unstable. The stones on the surface hinder landscaping.

GeC - Canton and Charlton soils, 3 to 15 percent slopes, extremely stony

This mapping unit consists of gently sloping to sloping, well drained soils on ridges, hills, and side slopes of glacial till uplands. The areas are oval or irregular in shape. Slopes are mostly smooth and convex and are 100 to 600 feet long. Stones cover 8 to 25 percent of the surface. About 45 percent of this unit is Canton soils, 40 percent is Charlton soils, and 15 percent is other soils. Some areas of this unit consist almost entirely of Canton soils, some almost entirely of Charlton soils, and some of both. The soils were mapped together because they have no significant differences in use and management.

SOILS DESCRIPTIONS

Soils Information-Inwood Subdivision
Page 2.

Typically, the Canton soils have a surface layer of very dark grayish brown fine sandy loam 2 inches thick. The subsoil is yellowish brown fine sandy loam, gravelly fine sandy loam, and gravelly sandy loam 21 inches thick. The substratum is pale brown gravelly loamy sand to a depth of 60 inches or more.

Typically, the Charlton soils have a surface layer of dark yellowish brown fine sandy loam 5 inches thick. The subsoil is yellowish brown fine sandy loam and sandy loam 20 inches thick. The substratum is light yellowish brown and light brownish gray sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of somewhat excessively drained Gloucester and Hollis soils, well drained Paxton soils, and moderately well drained Sutton soils. Also included are a few nearly level areas and a few areas that have a compact substratum at a depth of 40 to 50 inches.

The water table in these Canton and Charlton soils is commonly at a depth of more than 6 feet. The permeability of the Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. The permeability of the Charlton soils is moderately rapid. Both soils have moderate available water capacity and medium to rapid runoff.

Slope is the main limitation of these soils for community development, especially for onsite septic systems. Slopes of excavations in these soils are unstable. The stones on the surface hinder landscaping.

HrC - Charlton-Hollis complex, 3 to 15 percent slopes, very rocky

This complex consists of gently sloping to sloping, somewhat excessively drained and well drained soils on hills and ridges of glacial till uplands. The areas of this unit are mostly irregular in shape. Slopes are mostly complex and are 100 to 200 feet long. Stones cover 1 to 8 percent of the surface.

This unit is about 55 percent Charlton soils, 20 percent Hollis soils, 15 percent other soils, and 10 percent exposed bedrock. The Charlton and Hollis soils are in such a complex pattern that it was not practical to map them separately.

Typically, the Charlton soils have a thick, fine sandy loam topsoil and subsoil over a sandy loam substratum. The soils are commonly deeper than 60 inches.

The Hollis soils have fine sandy loam topsoil and subsoil from 10 to 20 inches thick over hard, unweathered schist bedrock.

Included with these soils in mapping are small areas of well drained Canton and Paxton soils; moderately well drained Sutton and Woodbridge soils; and poorly drained Leicester soils. Also included are small areas with bedrock at a depth of 20 to 40 inches.

SOILS DESCRIPTIONS

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The water table of these soils is commonly at a depth of more than 6 feet. The available water capacity is moderate in the Charlton soils and very low or low in the Hollis soils. Both soils have moderate or moderately rapid permeability and medium to rapid runoff.

The areas of exposed rock and the depth to bedrock in the Hollis soils limit the use of these areas for community development, especially as a building site or as a site for onsite septic systems. The stones on the surface restrict landscaping.

HrE - Charlton-Hollis complex, 15 to 45 percent slopes, very rocky

This complex consists of moderately steep to steep, somewhat excessively drained and well drained soils on hills and ridges of glacial till uplands. Areas of this unit are mostly long and narrow or oval in shape. Slopes are mainly convex and are 100 to 500 feet long. Stones and boulders cover 1 to 8 percent of the surface. This unit is about 55 percent Charlton soils, 20 percent Hollis soils, 15 percent other soils, and 10 percent exposed bedrock. The Charlton and Hollis soils are in such a complex pattern that it was not practical to map them separately.

Typically, the Charlton soils have a surface layer of dark yellowish brown fine sandy loam 5 inches thick. The subsoil is yellowish brown fine sandy loam and sandy loam 20 inches thick. The substratum is light yellowish brown and light brownish gray sandy loam to a depth of 60 inches or more.

Typically, the Hollis soils have a surface layer of dark grayish brown fine sandy loam 2 inches thick. The subsoil is yellowish brown gravelly fine sandy loam 12 inches thick. Hard, unweathered schist bedrock is at a depth of 14 inches.

Included with these soils in mapping are small areas of well drained Canton and Paxton soils; and moderately well drained Sutton and Woodbridge soils. Also included are areas with bedrock at a depth of 20 to 40 inches and a few small areas with slopes of more than 35 percent.

The water table of these soils is commonly at a depth of more than 6 feet. The available water capacity is moderate in the Charlton soils and very low or low in the Hollis soils. Both soils have moderate to moderately rapid permeability and rapid runoff.

The slope, exposed rock, and the depth to bedrock in the Hollis soils limit these areas for community development, especially as a site for onsite septic systems and buildings.

SOILS DESCRIPTIONS

Soils Information-Inwood Subdivision
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Lg - Ridgebury, Leicester and Whitman soils, extremely stony

This mapping unit consists of nearly level, poorly drained and very poorly drained soils in depressions and drainageways of glacial till uplands. The areas are mostly long and narrow or irregular in shape. Slopes range from 0 to 3 percent and are mainly 100 to 300 feet long. Stones cover 8 to 25 percent of the surface. About 40 percent of this unit are Ridgebury soils, 25 percent are Leicester soils, 15 percent are Whitman soils and 10 percent are other soils. Some areas of this unit will consist of one these soils and other areas will consist of two or three. The soils of this unit were mapped together because they have no significant differences in use or management.

The Ridgebury soils have a seasonal high water table at a depth of about 10 inches from fall through spring. The permeability of the soils is moderate to moderately rapid in the surface layer and the subsoil and slow to very slow in the substratum. Runoff is slow The Ridgebury soils have a moderate available water capacity.

The Leicester soils have a seasonal high water table at a depth of about 10 inches from fall through spring. The permeability of the soils is moderate or moderately rapid throughout. Runoff is slow. The Leicester soils have a moderate available water capacity.

The Whitman soils have a seasonal high water table at or near the surface from fall through spring. The permeability of the soils is moderate or moderately rapid in the surface layer and subsoil and very slow in the substratum. Runoff is slow. The Whitman soils have a moderate available water capacity.

The high water table and slow to very slow permeability are major limitations of the soils of these areas for community development. Steep slopes of excavations in these soils slump when saturated. The stones on the surface restrict landscaping and lawn areas are soggy most of the year.

5. Hydrology

The site can be divided into three subdrainage areas. The majority of the site (74%) drains northward to an unnamed tributary to the Skungamaug River and its accompanying wetlands. In part, these wetlands occur at the site's northern limits. Before it flows under North Road, west of the site and empties into Skungamaug River, the unnamed streamcourse is temporarily retained in a small farm pond. The southeast corner of the site, which includes parts of 17 lots and open space parcel "A" and which comprises about 21 acres drains to an unnamed tributary to Brigham Tavern Brook or flows via drainageways directly to Brigham Tavern Brook. Brigham Tavern Brook empties into the Willimantic River. Lastly, the southwest corner of the site, about 5 acres drains to Lee Brook, another Skungamaug River tributary. (See **Watershed Boundary Map**)

According to a map published by the Department of Environmental Protection call Water Quality Classifications of Connecticut, Murphy, 1987 the surface waters on the site have not been classified and, by default, are presumed to be Class "A" streamcourses.

Class "A" surface waters maybe suitable for private drinking water supply, recreational or other uses and may be subject to absolute restrictions on the discharge of pollutants, although there maybe certain discharges that would be allowed.

The map also classifies groundwater and, as such, groundwater within the site is designated as GA. A GA water resource is suitable for private drinking water supplies without treatment.

Development of the site for approximately 71 single-family homes and ancillary road system can be expected to raise post-development runoff conditions from existing runoff conditions. These increases will arise from the creation of impervious surfaces such as roads, driveways, rooftops, sidewalks and patios.

The two major concerns with increased runoff are the potential for flooding and stream channel erosion. From a flooding standpoint, the applicant has indicated on the preliminary plan that a detention control structure (basin) will be used to maintain post-development flows at pre-development flows. The detention basin will be created in a 1.5 acre wetland on open space parcel "B". The proposed detention basin site is in a position to capture runoff from a large part of the proposed subdivision.

The purpose of the detention basins will be to release post-development runoff at a slower rate so that flooding problems do not occur to downstream areas. Details for the proposed detention and the stormwater management plan were not available for review by Team members. A

stormwater management plan that includes pre- and post-development calculations should be prepared by the applicant's engineer and presented to the town for their review. It is strongly suggested that applicant's engineer reference Connecticut Guidelines for Soil Erosion and Sediment Control (1985) and the Tolland County Soil and Water Conservation District's Model Runoff Management System Regulation for the preparation of the stormwater management plan.

According to the Tolland County, Connecticut Soil Series 1961 it identifies the wetland soils in the area of the proposed detention basin as Lg (Leicester-Ridgebury-Whitman very stony complex), although this has not been verified by applicant's soil scientist.

The Lg soils have been mapped as an undifferentiated unit comprising Leicester, Ridgebury and Whitman soils. All three soils are very deep, loamy soils that formed in glacial till. The Ridgebury and Whitman soils develop in the compact glacial till while the Leicester soils develop in the more friable till. They range from poorly drained (Leicester and Ridgebury) to very poorly drained (Whitman). In general, the Leicester and Ridgebury soils are nearly level or gently sloping soils in drainageways and low-lying positions of till covered uplands. The Whitman soils occur on nearly level to gently sloping depressions and drainageways on till covered uplands.

The major concern of these soils from an engineering standpoint focuses on a seasonally high water table. A high water table condition is at or near ground surface in the Leicester and Ridgebury soils generally between November and May. In the Whitman soils, a high water table condition, at or above ground surface, occurs September through June.

Utilizing the previously mentioned site for a detention basin will require a permit from Coventry's Inland-Wetlands Agency. In order to minimize the potential adverse impact to the wetland in the area, consideration should be given to locating the detention basin outside of the wetlands.

The other concern with post-development runoff is the potential for gullying (streambank erosion) and pollution transport. Because the till soils may contain silt, fine sand, and clay sized particles, the potential for siltation is apparent. Furthermore, areas of moderate to steep slopes will aggravate this potential problem.

Conscientious construction practices should be employed so that water quality problems do not arise in streamcourses on and off-site. Stormwater discharge points should outlet outside of wetland areas and not directly to streamcourses, but preferably to well protected, shallow basins. These basins should be considered for the southeast corner of the site where no detention is proposed. The outlet control structures for detention basins and pipe discharge points should be designed so that flow rates are minimized, and peak volumes decreased (energy dissipators). In order to protect off-site surface waterbodies, the proposed detention basin can also provide a

sediment retention function and should be designed to do this. From time to time, the basin or basins will need to be cleaned of sediment so that its capacity to store stormwater is not diminished. An access road for maintenance vehicles should be shown on the plan.

In any well run activity of this type, silt fences, haybales, temporary sediment basins, and anti-tracking devices are necessary to help reduce the chance for environmental damage to wetlands and watercourses on and off-site and complaints from neighbors. Disturbed areas should also be kept to a minimum.

In order to minimize erosion problems and surface water quality degradation, a carefully designed and detailed erosion and sediment control plan should be developed, closely followed and policed by town officials as often as necessary.

WATERSHED BOUNDARY MAP

Scale 1" = 1000'

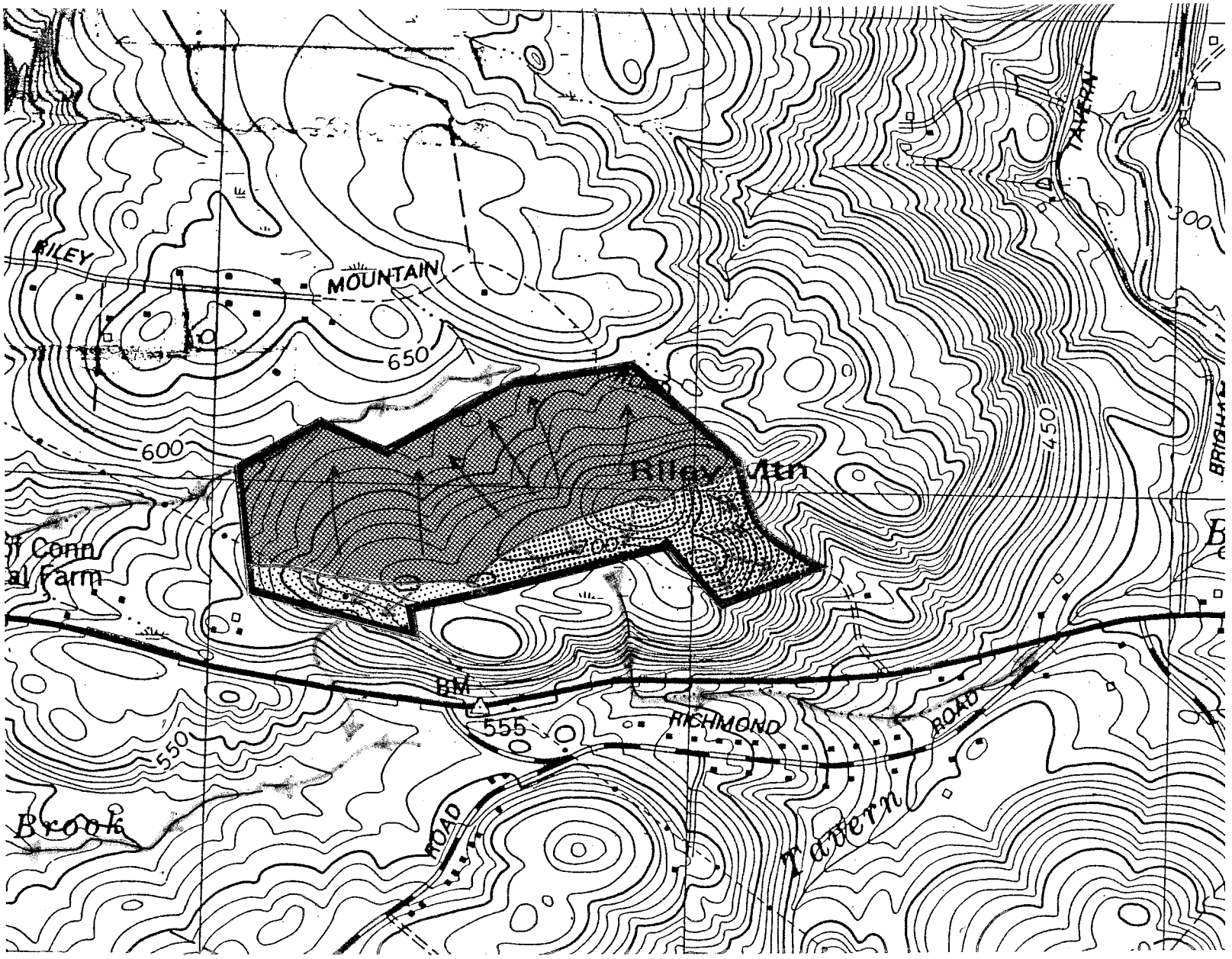
Watercourses showing direction of flow

Portion of site that drains to an unnamed tributary to Brigham Tavern Brook

Portion of site that drains to an unnamed streamcourse (shown above) that is tributary to the Skungamaug River.

Portion of site that drains to Lee Brook

Surface flow showing direction of runoff



6. Water-Supply

The water supply for each lot in the proposed subdivision would be derived from 6-inch diameter drilled wells with steel pipe cased firmly into solid rock and completed as open boreholes in the underlying metamorphic bedrock. A minimum of 5 feet of casing should extend into the bedrock.

A typical well depth for a bedrock well ranges from 150-300 feet. Although bedrock is not known to be a prolific aquifer, Water Resources Bulletin No. 11 (Shetucket River Basin) indicates that of 134 wells surveyed which tap metamorphic bedrock, 90% yielded about 3.0 gallons per minute or more. A yield of 3.0 gallons per minute would be equivalent to 4,320 gallons of water for a 24-hour periods.

The Team's geologist reviewed well completion reports for 14 bedrock wells serving homes along Riley Mountain Road. These wells drilled, between 1970 and the present, averaged 4-5 gallons per minute at depths ranging between 150 and 405 feet below ground surface (**see Figure 1**).

Using some basic assumptions, the Team's geologist evaluated available recharge and predicted water use of the subdivision to estimate the potential impact on the bedrock aquifer. Specifically, recharge calculations show that the amount of water available to the site each day is about 50,600 gallons. This is based on groundwater recharge amounts of 8 inches per year for an upland, mostly till-covered site and 85 pervious acres (less 10 acres for impervious surfaces) allowing for infiltration. Predicted water use at the site is estimated at 21,300 gallons per day per capita water usage. This is based on a 75 gallon per day per capita water usage. An assumption of 4 persons per single-family residence (71 lots) was used.

Based on these figures, it is estimated that the planned subdivision will receive about 2.4 times the recharge as is necessary to balance water demand. In addition, induced recharge by properly renovated septic system effluent (about 95%) plays an important role in the groundwater budget. The latter stresses the need for properly designed and installed septic systems.

It must be kept in mind that the computations in the preceding paragraphs assumes the underlying bedrock is fractured and is capable of transmitting usable amounts of water to the proposed wells. This cannot be determined exactly without first drilling the well.

In order to provide the adequate protection of the bedrock aquifer, all wells will need to be properly installed in accordance with applicable State Public Health Code and Connecticut Well Drilling Board regulations. Additionally, the town sanitarian will need to inspect and approve all well locations. Each well should ideally be located on a relatively high portion of the lot, properly separated from septic systems or any other potential pollutant e.g. road drainage, curtain drains, backwash from water softeners, etc.

In order to minimize the risk of mutual interference between neighboring wells during pumping periods, every effort should be made to separate neighboring wells as far apart as possible. Generally, a well spacing of 200 feet would be desirable, but the proposed high density development will probably not allow for this setback.

Figure 1

Summary of Domestic Water Supply Wells Drilled on Riley Mountain Road (1970 to present) Coventry Connecticut*

Well	Total Depth of Well (ft.)	Well Yield (gpm)
1	255	5
2	250	6
3	250	4
4	200	8
5	220	2
6	350	3
7	300	4.5
8	375	2
9	405	12
10	150	3
11	150	6
12	205	12
13	405	1.75
14	265	2

*All wells surveyed tapped the underlying bedrock aquifer.

A possible alternative to drilling individual wells on each lot would be the development of a community water supply system served by one or more drilled bedrock wells. The latter will depend upon the yield of the well and the number of homes served in the subdivision. Assuming a groundwater demand of 21,300 gallons per day for the proposed subdivision, a well yielding about 20

gallons per minute would be required. Utilizing two or more wells in an isolated part of the site, far removed from sources of contamination i.e., septic systems, road drainage, etc., may help to reduce the chance of wells pollution to individual wells drilled on the site and mutual interference between neighboring wells during pumping periods, since 71 wells drilled in a concentrated area would be required under the proposed plan.

A water supply system will require that the applicant obtain a "Certificate of Public Convenience and Necessity" from the Department of Public Utility Control (DPUC) and Department of Health Services (DOHS). If this type of water supply is considered, Richard Albani, DPUC at 827-1553 should be contacted regarding details.

The DOHS (566-1251) will also need to be contacted regarding the water supply with respect to well site selection, water quality, yield and plans for pumpage, storage and distribution. Also, consideration should probably be given in advance to provide for proper operation and maintenance of the community water supply system (i.e. take over by a private or municipal water supply company).

7. Sewage Disposal

Municipal sewers are not available to this part of Coventry, therefore, the proposed subdivision will be served by individual on-site septic systems. In order to determine subsurface conditions for on-site septic system suitability for the parcel, a total of 86 deep test holes were excavated through the site. This work, which was conducted during August and September was performed by Landtech Associates, Inc. of Manchester, Connecticut.

A review of the deep test hole data indicates on-site sewage disposal should be feasible on a large percentage of proposed lots. No percolation test data was available, however. This work should be done on each lot and the results shown on the plan.

A depth of 7 feet or more was accomplished in 84% of the deep test excavated on the site. Ledge rock was encountered at depths ranging between 2.5 feet and 6 feet in 14 deep test holes. These holes were located on Lots 15, 16 and 60/61 in the northern parts and Lots 24, 25, 69 and 71 in the eastern parts. Ledge will be an important design constraint on these lots and warrants careful examination. It is suggested that several test holes be excavated on each of the above lots, so that a good profile of the bedrock surface can be determined.

Although deep test hole data denotes the widespread presence of a firm/compact soil zone about 1.5 - 3.0 feet below the ground surface, a seasonal high water table condition, a shallow ground water table and

shallow soil mottling (an indicator of a high groundwater table condition) was absent in the majority of deep test holes. Test hole #38 on the open space parcel revealed soil mottling at 30 inches. It should be pointed out that soil testing was performed at the end of the summer when groundwater level tables are typically nonexistent or at their lowest. It would probably be wise to randomly dig deep test holes throughout the site during the spring months when water tables are at their highest. If these deep test holes confirm the results of earlier work, then seasonally high water table conditions should not be a major design constraint.

The Public Health Code requires the bottom area of any leaching system to be a minimum of 4 feet above ledge rock and at least 1.5 feet above maximum groundwater level. In general, when ledge rock is found at less than 4.5 feet below ground surface, the area would certainly be of special concern. In particular where both on-site wells and sewage systems are utilized there is greater possibility for well contamination or water quality problems (see **Water Supply** Section). Sewage effluent may not receive adequate filtration and renovation before the sewage reaches the rock where it may enter fractures or seams, traveling to nearby wells.

Considering the quantity of sewage discharged for single family residences, one acre lots would normally be considered of sufficient size to accommodate both a well and septic system. However, where unfavorable soil conditions and/or terrain exists, considerably larger lots (i.e. lower density of development) should be provided. Large lots themselves do not necessarily assure the availability of sufficient suitable area for sewage disposal purposes. This can only be demonstrated by adequate on-site testing.

A minimum of one deep test hole in the proposed primary and reserve leaching area is required for each lot. In the shallow to bedrock areas, certainly more than 2 deep test holes should be provided in the proposed leaching system area.

Individual lot testing will provide the Town health department with the necessary information to determine suitability for leaching purposes. If thorough testing of any proposed lot fails to identify a satisfactory leaching area and unsuitable conditions as identified in Section 19-13-B103e(a)(3.) exist, the lot should be combined with adjacent properties or otherwise removed. It is probable that some of the proposed lots will require detailed plans prepared by a registered professional engineer due to shallow to bedrock conditions and the potential for slow percolation rates resulting from the compact or firm soil zone encountered on the parcel. In some places, steep slopes may also be a hindrance.

Clustering of the houses on smaller parcels would seem to have certain merits such as retention of open space. Again, however, a major concern or question is one of locating sufficient suitable area for sewage disposal purposes on each lot. As previously stated, in many of the areas tested to date, satisfactory or favorable soil conditions exist.

8. Planning Comments

Compliance with State, Regional, and Local Plans

The State Policies Plan for the Conservation & Development of Connecticut, 1987 - 1992 and the Regional Growth and Preservation Guide Plan, WRPA, 1981, recommend the proposed site for "Rural Land" and "Low Density Rural" uses, respectively. Such uses would limit development to that which can be supported by on-site water and sewer, and which are consistent with the open rural character of adjacent lands. The proposed plan is consistent with such recommendations. While the regional plan recommends a minimum house lot size of two acres, it also encourages the use of the concept of a cluster design. The proposed development is therefore generally consistent with these regional and state plans.

The State Master Transportation Plan includes no state funded highway projects scheduled in the vicinity of the site. The closest projects scheduled are on Route 31 south of Route 44. While the State's concept plan for the I-84 trade-in funds calls for upgrading the entire Route 44 corridor, specific improvements have not yet been detailed.

The Regional Transportation Plan, 1990 Update retains from the previous update Coventry's priority for sight line improvements at the intersection of Routes 44 and North River Road. This intersection has been experiencing increasing traffic volumes due to the new condominium and subdivision developments in the area, and increased commuter traffic in general. The development of Inwood Forest would affect traffic volumes at this intersection, as traffic to and from the development would use Riley Mountain Road and North River Road as the most direct route to Route 44.

The proposed development is generally consistent with the Town of Coventry's zoning regulations for a modified cluster design in an RU-4O zone. The map accompanying the town's Plan of Development (1979), however, indicates that a strip of land approximately 1000 feet wide crossing the parcel north/south is designated to be preserved as open space. While this strip includes the 5.5 acre piece of open space at the southeastern corner of the planned development, it appears to include also several acres which would be developed as house lots. In this respect, the proposal would not conform to the town's plan to preserve land designated for open space. It should be noted that the town's Plan of Development is in the early stages of revision.

Conformance with Guidelines for Subdivision Streets, ConnDOT, 1987

Of greatest concern is the proposal's lack of conformance with the state's Guidelines for Subdivision Streets. A copy of the relevant section of

these Guidelines is included at the end of this report. The only access to Inwood Forest would be via North River Road and Riley Mountain Road, the latter of which is a dead-end street currently serving twenty-six homes. As noted in the guidelines, twenty homes is the maximum recommended for a dead-end street because it may be blocked in an emergency situation. Despite the fact that some roads show a continuation of Riley Mountain Road through to Route 44, it is WRPA's understanding that no such continuation exists, nor is there a right-of-way. We estimate that Riley Mountain Road would be a mile long from North River Road to Inwood Forest, and that the subdivision's internal loop road would add another mile. The effect would be functionally equivalent to a two-mile long cul-de-sac. Inwood Forest would add an additional 71 homes. For almost one hundred homes. Riley Mountain Road would provide the only means of entrance and exit, resulting in a gross violation of the state guidelines which are based on nationally accepted engineering standards promulgated by the Institute of Transportation Engineers. Acceptability of the concept plan for Inwood Forest should require that an additional access route be included.

Open Space

Although the concept plan for this development shows three parcels of open space totaling 18.3 acres, a few observations should be made.

Parcel A, 5.5 acres at the southeastern corner of the development is accessible only from lots #28 and #29 within the development, or from Riley Mountain Road outside the development, limiting its usefulness to the residents of Inwood Forest. At the least, some access pathway should be provided from the internal subdivision roadway/cul-de-sac closest to this parcel.

Parcel B, 4.7 acres, is approximately one-third wetlands and includes a drainage detention area.

Parcel C, 8.1 acres, appears to include almost three acres of land for the power line right of way, which crosses the southwestern corner of the development; the rest of this open space parcel may be reached only by crossing the power line right of way. The recent controversy over possible detrimental health effects associated with exposure to power lines may be of some concern to the town, and should be of concern to the prospective residents of this development, who would plan on using this open space.

Although the open space designated by the plan represents just under 20% of the parcel's total acreage, it is functionally inadequate because of the characteristics described above, and because of the fact that the three separate small parcels are not linked.

Effect on Population

It is estimated that 71 new single family homes would result in an 236 additional residents (a 2.6% increase, based on the town's 1988 population as estimated by the Department of Health Services), and would include an additional 60 children of school age, grades K-12 (a 4% increase).*

*Demographic Multipliers for the New England region are from the U.S. Department of Commerce, Bureau of the Census, U.S. Census of Population and Housing (Public Use Sample). 1980 as presented in Burchell, Listokin, and Dolphin. The New Practitioners's Guide to Fiscal Impact Analysis. 1989 Exhibits 12,13.

Other Issues

Traffic Volumes

Based on an average of 10 daily vehicle trips per housing unit for single family homes, we would expect Inwood Forest to generate 710 additional vehicle trips per day. Depending on where they are destined, those vechicle trips will use North River Road and then Merrow Road, Goose Lane, or Broadway to get to collector roads such as Routes 31, 32, 44, and 195.

ConnDOT's average daily traffic (ADT) volumes estimates for 1987 and 1988 for selected sections of Routes 31, 44 and 32 are shown below. (See also comments under "Regional Transportation Plan", above).

Average Daily Traffic

	1987	1988
Route 31		
Tolland Town Line to RT. 44	2,200	2,400
Route 44		
Overlap with Route 31	12,800	14,300
Route 31 to Route 32	6,500	7,200
Route 32		
Route 44 to Route 195	5,500	5,900

Solid Waste Generation and Recycling

An additional 236 residents from this development would generate between 165 and 203 tons of solid waste per year (depending on whether the generation rate is closer to the local estimate of 0.7 or the statewide average of 0.86 tons per person per year). Some of this will be recycled with the January 1, 1991, onset of the state's mandatory recycling program. The rest will shorten the remaining life of Coventry's landfill to the extent that the population increase represented exceeds the population growth rate used in calculating the landfill's estimated life, (16 years).

(Excerpt from Guidelines for Subdivision Streets, Prepared by the State of Connecticut, Department of Transportation, January 1987.)

16-3.14 Cul-de-Sacs

Cul-de-sacs, or dead-end streets, should be designed for a maximum ADT of 200 vechicles per day (vpd). This volume of traffic relates to a 20-home generation, assuming 10 trips per day per single unit dwelling. Depending on the size of the lot frontages, the maximum length of cul-de-sac will vary. For example, if the local zoning requires a minimum lot frontage of 100 feet, then the maximum cul-de-sac length would be 1000 feet, assumimg homes are on both sides of the street. The recommended maximum length is generally between 700 and 1000 feet. However, local conditions may require a longer length to more efficiently use the space available. Due to the possibility that an emergency may occur and that the road may be blocked, the use of more than 20 homes on the cul-de-sac is not recommended.

As discussed in Section 16-3.O4, expandable subdivisions deserve special consideration. If it is expected that a cul-de-sac will be extended for future development, then the street must be designed as a residentia l street, providing adequate width for future traffic. Expansion of existing cul-de-sacs should include the reconstruction of the street to accommodate the higher volumes of traffic.

The most common end treatment for a cul-de-sac is the circular turnaround. When used, it is desirable to provide for an outside turning radius of 45 feet to accommodate small fire apparatus, garbage trucks, snow plows. etc. A minimum of 30 feet is necessary for larger passenger cars. If parking is to be allowed within the circular section of pavement, then larger radii should be used. If radii are greater than 46 feet, the resulting expanse of pavement may be unsightly. In this case, the use of a center island may be considered, providing a 25 foot wide roadway is maintained around the island for maneuverability. On any dead-end street, it is not desirable to place a

driveway lot entrance directly opposite the end of the street leading into the turnaround area. To provide for the right-of-way requirements, an extra 10 to 15 feet should be added to the radius.

Under certain conditions, a "hammerhead" or "Tee" type turnaround may be considered. These are most applicable where blocks are very short and the number of homes to be served is very small (6 homes). Furthermore, it is not desirable to place driveway entrances at the ends or caps of the turnaround.

9. Archaeological Review

The project area is located in close proximity to the Coventry Glass Factory National Register Historic District to the west and the Brigham Tavern National Register Historic Site to the east. The USGS map and National Register Historic District map provide further details concerning the location and boundaries of this historically significant area. The project area does not impact directly on either of these sites. However, the proposed subdivision should be designed to minimize visual intrusion upon the historic and architectural ambience of the Coventry Glass Factory National Register Historic District. All mature trees which would serve to provide a visual buffer between any new housing units and the historic district should be retained wheresoever feasible.

A review of the State of Connecticut Archaeological Site Files and Maps indicate no prehistoric sites in the project area. The Environmental Review Team field inspection suggests a low to moderate potential for prehistoric cultural resources except where outcroppings of ledge are involved. These ledge areas may have prehistoric encampments associated with them as a means for shelter. We recommend that if any blasting is to occur in the ledge areas that the Office of State Archaeology be notified to conducted limited testing prior to any construction activities.

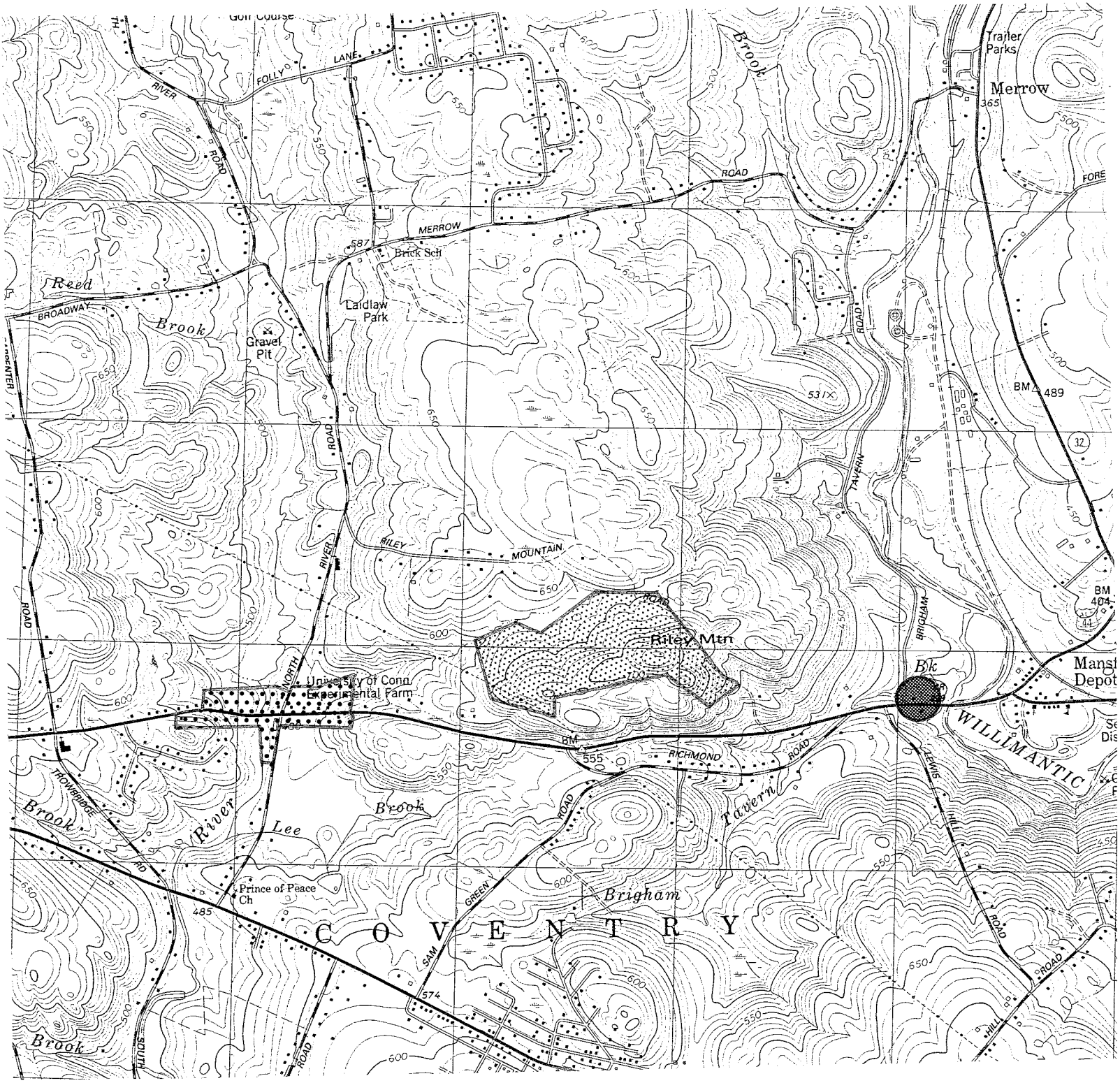
In summary, the Inwood Forest Subdivision is located in close proximity to two National Register of Historic Places in Coventry. The project area does not possess archaeological connection to either the Glass Factory or Brigham's Tavern, however, visual intrusion should be considered for the Glass Factory Historic District and its impact minimized. Prehistoric sites may be associated with outcroppings of bedrock and should be explored if blasting of these areas is anticipated. The Office of State Archaeology is prepared to offer the Town of Coventry and the developer technical assistance on preserving the cultural resources in the project area.

NATIONAL REGISTER OF HISTORIC PLACES SITES IN CLOSE PROXIMITY TO THE PROJECT SITE

Scale 1" = 2000'

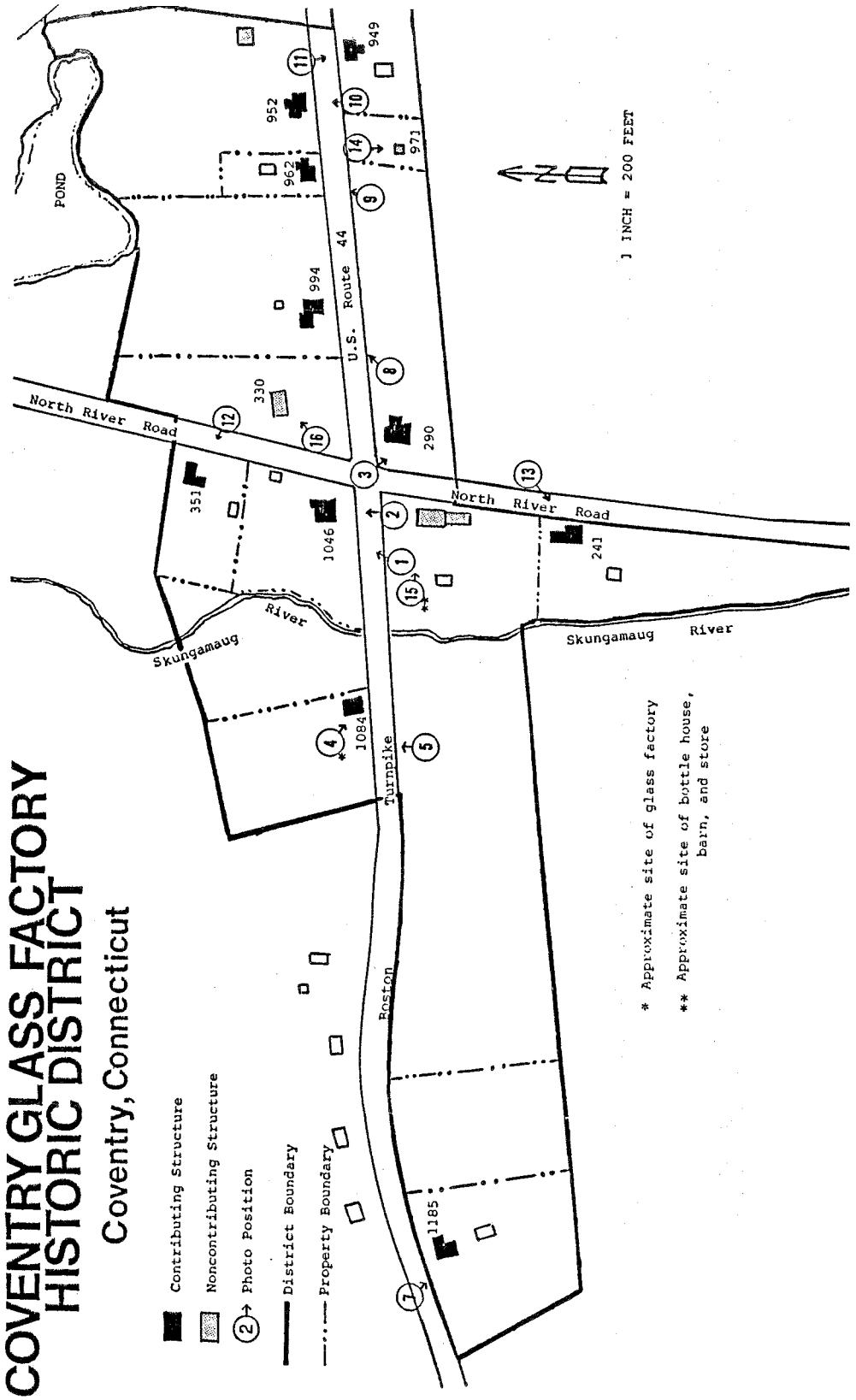
Coventry Glass Factory Historic District

Brigham's Tavern National Register Site



COVENTRY GLASS FACTORY HISTORIC DISTRICT

Not to Scale



ABOUT THE TEAM

The Eastern Connecticut Environmental Review Team (ERT) is a group of professionals in environmental fields drawn together from a varety of federal, state and regional agencies. Specialists on the Team include geologists, biologists, foresters, soil 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 region.

The services of the Team are 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, landfills, commercial and industrial developments, sand and gravel excavations, 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 official 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 and the ERT Coordinator. A request form should be completely filled out and should include the required materials. 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 and request forms regarding the Environmental Review Team please contact the ERT Coordinator: 203-345-3977, Eastern Connecticut RC&D Area, P.O. Box 70, Haddam, Connecticut 06438.