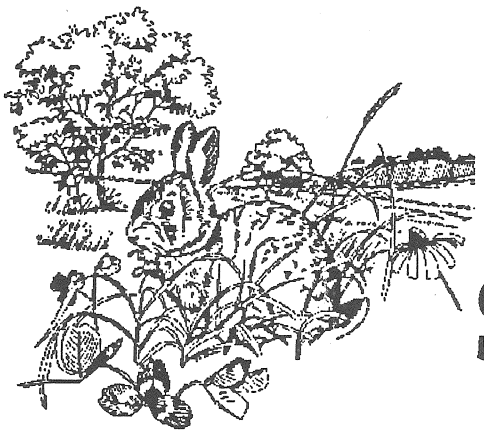

Eastwood Subdivision

East Hampton, Connecticut

Eastern Connecticut Environmental Review Team Report

Eastern Connecticut
Resource Conservation and Development Area, Inc.

Eastwood Subdivision

East Hampton, Connecticut

Environmental Review Team Report

Prepared by the
Eastern Connecticut Environmental Review Team
of the Eastern Connecticut
Resource Conservation and Development Area, Inc.

for the
Planning and Zoning Commission
East Hampton, Connecticut

May 2000

CT Environmental Review Teams
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Acknowledgments

This report is an outgrowth of a request from the East Hampton Planning and Zoning Commission to the Middlesex County Soil and Water Conservation District (SWCD). The SWCD referred this request to the Eastern Connecticut Resource Conservation and Development Area (RC&D) Executive Council for their consideration and approval. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

The Eastern Connecticut Environmental Review Team Coordinator, Elaine Sych, would like to thank and gratefully acknowledge the following Team members whose professionalism and expertise were invaluable to the completion of this report.

The field review took place on Tuesday, March 28, 2000.

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Stephanie Shakofsky	Executive Director and Hydrogeologist Middlesex County Soil & Water Conservation District (860) 346-3282

I would also like to thank Diane Blackman, town planner, and Peter Carli, the applicant for their cooperation and assistance during this environmental review.

Prior to the review day, each Team member received a summary of the proposed project with location and soils maps. During the field review Team members were given additional plans and information. Some Team members made separate or follow-up site visits. 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 plans 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 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 reviewing this proposed subdivision.

If you require additional information please contact:

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Introduction

Introduction

The East Hampton Planning and Zoning Commission has requested assistance from the Eastern Connecticut Environmental Review Team in conducting a review of a proposed subdivision.

The ±78 acre site is located on Sillimanville Road. The site abuts Comstock Ridge Subdivision which was the subject of an ERT report in 1998. A 32 lot single family residential subdivision is proposed. The homes will be served by on-site wells and sewage disposal. Construction of 2700 feet of new road will connect with Comstock Trail (from Comstock Ridge Subdivision) which is currently being built. The road will access Sillimanville Road in East Hampton.

Objectives of the ERT Study

The Commission has asked for assistance and guidance in determining the appropriateness of the subdivision design with concerns in the following areas: soil erosion and sediment control, stormwater management, wetland impacts and vernal pool information, forestry and vegetation, site design and traffic and access.

The ERT Process

Through the efforts of the planning and zoning commission this environmental review and report was prepared for the Town of East Hampton.

This report provides an information base and a series of recommendations and guidelines which cover the topics requested by the commission. Team members

were able to review maps, plans and supporting documentation provided by the applicant.

The review process consisted of four phases:

1. Inventory of the site's natural resources;
2. Assessment of these resources;
3. Identification of resource areas and review of plans; and
4. Presentation of education, management and land use guidelines.

The data collection phase involved both literature and field research. The field review was conducted on Tuesday, March 28, 2000. Some Team members made additional site visits. The emphasis of the field review was on the exchange of ideas, concerns and recommendations. Being on site allowed Team members to verify information and to identify other resources.

Once Team members had assimilated an adequate data base, they were able to analyze and interpret their findings. Individual Team members then prepared and submitted their reports to the ERT coordinator for compilation into this final ERT report.

Figure 1.

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Location Map

Scale 1″ = 1000′

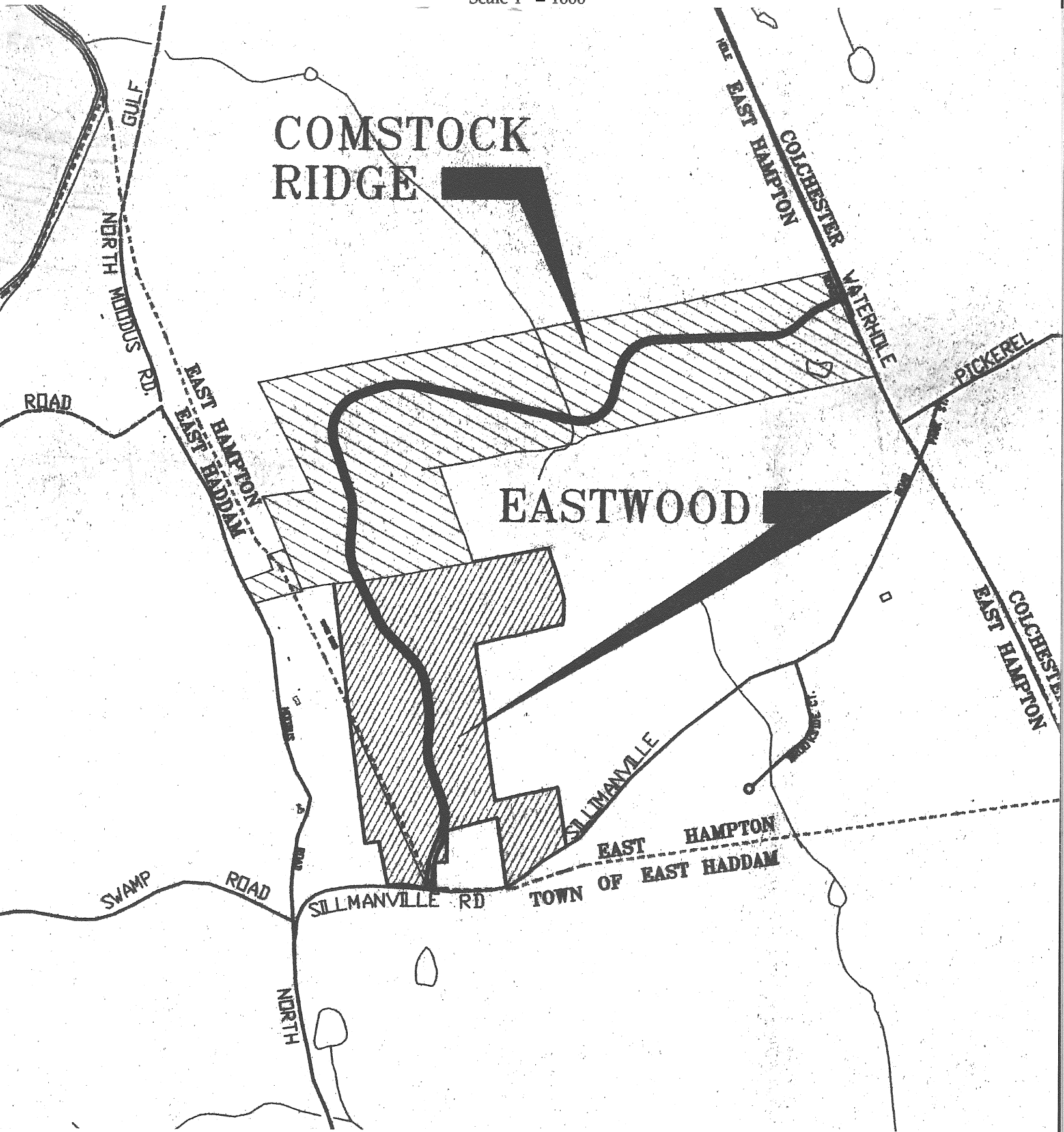

Figure 2.

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Topographic Map

Scale 1″ = 1000′

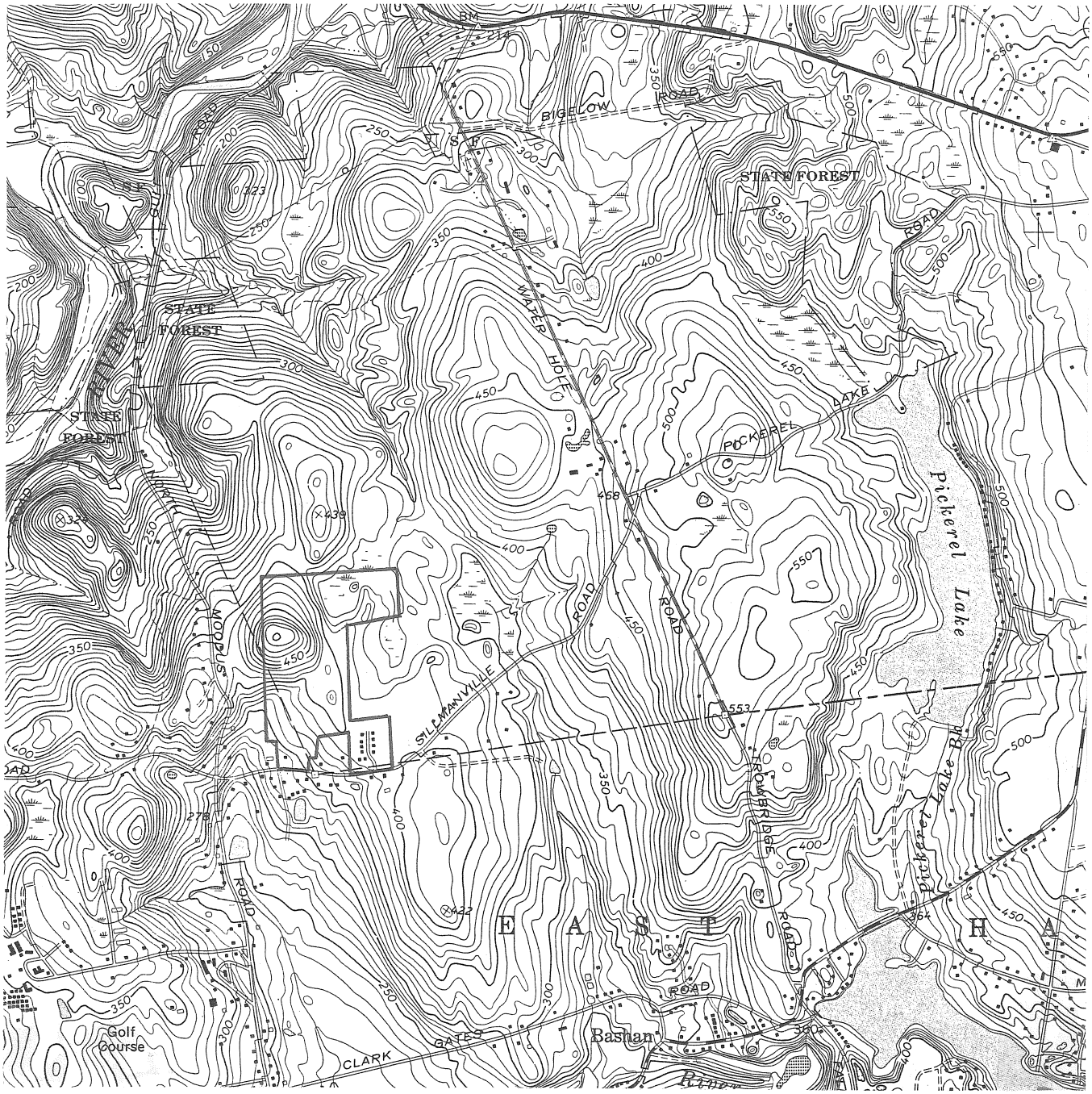

Figure 3.

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Soils Map

Scale 1″ = 1320′

Wetland Review

There are four mapped wetland areas on the plans.

Located on proposed lot 32, wetland #1 is a small, isolated, seasonally ponded wetland otherwise known as a vernal pool. With no permanent inlet or outlet, it exists within a forested landscape and has a shrub layer ringing the water's edge. A large population of fairy shrimp, an "obligate" vernal pool species, was observed foraging in the water on the southern boundaries of the wetland. This would confirm the fact that this pond does not contain a fish population and most likely dries up completely or to a point where the water becomes inhospitable to fish.

Vernal pools are typically small, shallow, circular depressions in the landscape which fill with water during the wetter periods of the year (spring and late fall), and become drier during the warmer summer months. True vernal pools also support unusually diverse and dynamic assemblages of wildlife. Much of this wildlife is solely dependent on these areas for one or more periods of their life cycle. Because of the absence of permanent water, fish do not live in these ephemeral pools, making these areas very attractive to certain animals which would normally fall prey to these carnivorous fish.

Wetland #2, located on proposed lots 1/3/4 is a larger, linear wetland situated on sloping lands. This wetland had no standing water at the time of inspection and consists of what appears to be a breached pond at the top of the slope, then blends into an early successional wet-meadow wetland with interspersed scrub-shrub habitats. No permanent watercourses were observed within the wetland. The wetland has no inlet, but outlets along Sillmanville Road into a roadside drainage swale.

Wetland #3 is a very small, isolated forested wetland located on proposed lot 24. With no indication of ponding water.

Wetland #4, largely contained within the proposed "Conservation Area" is the most sizable wetland on site. Primarily a flat, forested red maple swamp, this wetland has three arms which extend into sloped areas. One of these arms, located on proposed lot 22, contained wood frog and salamander egg masses that would suggest this portion of the wetland to be a vernal pool. Surface water in the wetland arm is pooled here as a result of a primitive dam in the vicinity of wetland flag B48 as indicated on the plan. After visiting this area on two separate occasions, it is likely that the water is seeping through the dam at a rate which may preclude the development of these egg masses into an adult life stage. However, with some modification to the impoundment, higher water levels could be attained which would make successful development more likely.

In addition to these mapped wetland areas, there are two areas of wetlands and/or watercourses observed on this parcel that were not delineated in the field or transposed onto the plan as flagged wetlands.

The first is located on proposed lots 29/30 and is indicated on the plan with a rough boundary and a wetland symbol, but no wetland flags designations in the field or on the plan. This wetland is primarily a shrub/scrub wetland with areas of open, ponded water in the interior and young red-maple trees along the border. A large population of wood frog larvae was observed on the southern side of the wetland. This would qualify this wetland as a vernal pool as the wood frog is recognized as an obligate vernal pool species.

The second unmapped wetland area is located on lots 6/7. Largely a permanently ponded area existing in a steeply sided depression, it appears to have been a relic livestock watering hole. At the time of inspection, it had an active inlet and

outlet. The inlet was fed by up-slope groundwater seepage and the outletting water soon infiltrated back into the ground. There appeared to be an area of associated wetlands to the east of the pond surrounding the inlet. There were no obligate vernal pool species observed in the pond and, based on the physical, botanical and hydrologic characteristics of the pond, it is unlikely that it would serve as vernal pool habitat.

There are no proposed direct impacts (filling or excavation) to mapped wetland areas of this parcel. However, this is not true for the unmapped wetland area on lot 6/7 where a septic system is proposed directly within the ponded area. Indirect impacts to these wetland areas may include those associated with stormwater quality, erosion and sedimentation control and wetland dependent wildlife.

It is commendable that the applicant has largely maintained a 100 foot buffer from mapped wetland areas wherein no structures, septic leaching fields, or grading are proposed. This will most likely not be true for the unmapped wetland area on lots 29/30 where a septic system and grading is proposed within the designated setback area.

There are two stormwater outlets proposed for this development. One which flows into a large "retention pond" prior to flowing into wetland #2 and one which outlets into upland areas also draining to wetland #2. With no supplemental material given to the Team for review, it is not clear what parameters were used to design the stormwater management system. The use of the retention pond, if designed correctly, may be effective at removing nutrient loaded sediments from the stormwater. There appears to be no such sediment control systems for the second outlet, other than the traditional sumps located within the catch basins which are ineffective at removing sediment from stormwater.

There was no erosion and sedimentation (E&S) control plan submitted for review so detailed comments on this potential impact would be premature. However, there are several broad concerns which can be raised at this point:

The steep slopes and proposed cuts and fills in the vicinity of lots 21/22 will be a potential threat to down-slope wetlands. Special E&S precautions should be made for this area.

There were no details submitted for the retention pond. There is no formalized outlet to the retention pond. Proper configurations for the primary and emergency spillway should be submitted for review. Specifications for the construction of the impoundment should be included. Also, any plans for long-term maintenance need to be formalized.

No details for storm water outlet E&S control for the outlet at road station 7+00 were included. The storm water outlets on a 10% slope and has a 180 foot run before entering the wetlands. The potential for erosion of the soils between the stormwater outlet and the wetlands should be addressed by the applicant.

The applicant should investigate the possibility of erosion within wetland #2 due to the two stormwater outlets leading into this wetland. Wetland #2 is situated on a slope and currently has no permanent watercourses. In addition, the applicant should investigate any increases of off-site stormwater drainage and the impact that it may have on the informal drainage system on Sillmanville Road leading down to an unnamed watercourse at the junction of Sillmanville and Moodus Roads. The watercourse in the vicinity of this junction appears to be highly erodible with areas of streambank erosion currently visible. Even though there may be on-site controls for peak flow attenuation, this may not alleviate the possibility of downstream erosion.

The potential for indirect impacts to the wetland-dependent wildlife inhabiting the two vernal pools located on proposed lots 29 through 32 should be more fully investigated by the applicant. The impacts the proposed development of these lots may have on this wildlife assemblage could be significant. The amphibian life that use these pools as breeding grounds soon migrate into the surrounding uplands to live out their adult phase and return to the pools only to breed. Modification of these adjacent upland areas therefore would have a significant impact on the associated wetlands.

Migration distances vary significantly between species. One literature search turned up figures ranging from a minimum of 200 feet and a maximum of 750' with an average migration of about 525'. The wood frog has a significantly larger dispersal range, known to be as far as one half mile from their host pool.

Due to the fact that these pools have no inlets or outlets and rely on ground water and accumulated surface waters for their hydrology, they may become very susceptible to changes in their water quality. Therefore it is not recommended that stormwater outlets be directed to, or nearby septic leaching fields discharged toward these pools.

Another phenomenon peculiar to vernal pools is that they often exist, as in this case, in groups, which have been shown to cooperate as a functional whole, with some pools in the group serving as a genetic "source" producing amphibian stock, and others as a genetic "sink" receiving this genetic stock. While research on this phenomenon is on-going, it is suspected that the interplay between each pool in the group is crucial to their long-term survival.

It should be mentioned here that none of the observed amphibian species discussed above is found on state or federal endangered species lists, yet scientists have been documenting a general downward trend in amphibian species with one of the probable causes being upland habitat fragmentation. The wood frog is

particularly susceptible to this fragmentation phenomenon. It has been shown in a Rhode Island study, that wood frogs require an unbroken territory of at least 100 acres and preferably over 1000 acres in order to proliferate.

Based on 1) what appears to be a dynamic, multi-pool community of amphibians, 2) the developing evidence of declining amphibian populations, and 3) the studies which have documented the upland habitat requirements of these wetland dependent species present on this site and 4) their sensitivity to changes in water quality, it is suggested that the applicant submit a wetland assessment/impact statement consider reconfiguring the southwestern portion of this proposed subdivision to allow for less development and less impact on this critical habitat.

If activities are authorized that would impact these vernal pools, it is suggested that the applicant propose mitigation for these impacts. One possible mitigation activity would be the modification of the previously mentioned primitive dam on lot 22 which would affect water levels and potentially create additional vernal pool habitat. Any mitigation plan of this nature should be formulated by a qualified wetland scientist.

Existing and proposed dam location and design, including temporary and permanent sediment/detention/retention basins should be reviewed by the Dam Safety Unit of the Inland water resources Division to determine their jurisdiction. The applicant should contact Wes Marsh at (860) 424-3706 to pursue this matter concerning the impoundment proposed for the retention basin.

Erosion and Sediment Control Review

The project proposal was submitted without an erosion and sediment (E&S) control plan. Connecticut's Public Act #83-388 requires that an E&S plan be submitted for any project larger than 1/2 acre. The statue reads: "Soil erosion and sediment control plan means a scheme that minimizes soil erosion and sedimentation and includes but is not limited to a map and narrative. The map shall show topography, cleared and graded areas, proposed area alternations and the location of and detailed information concerning erosion and sediment measures and facilities. The narrative shall describe the project, the schedule of major activities on the land, the application of conservation practices, design criteria, construction details and the maintenance program for any erosion and sediment control facilities that are installed."

Recommendation: *The project's proponents should submit an erosion and sediment control plan that adequately addresses soil erosion and sedimentation at the site.*

The Middlesex County Soil and Water Conservation District would be willing to review a proposed Erosion and Sediment Control Plan when it is available.

Stormwater Review

Since the site construction involves the disturbance of over five acres, Connecticut's General Permit for the Discharge of Stormwater and Dewatering Wastewaters (the "Permit") will cover the project. The permit requires that the site register with the Department of Environmental Protection (CTDEP) at least 30 days before the start of construction. The registrant must also prepare, submit and keep on site during the construction project, a Stormwater Pollution Control Plan (the "Plan").

Please note that while this review is based primarily on the state Permit, many of the erosion and sedimentation issues are included in the Connecticut Guidelines for Soil Erosion and Sediment Control (the "guidelines"), and are issues that must be dealt with on a local level before being included in the Plan. The Plan must include a site map as described in Section 6(b)(6)(A) of the General Permit and a copy of the erosion and sedimentation (E & S) control plan for the site. The E & S plan that has been approved by the Town in conjunction with the CTDEP Inland Water Resources Division (IWRD) and the local Soil and Water Conservation District may be included in the Plan. The plan and site map must include specifics on controls that will be used during each phase of construction, pursuant to permit Section 6(b)(6)(B). Specific site maps and controls must be described in the Plan, as well as construction details for each control used. The permit requires that "the plan shall ensure and demonstrate compliance with" the guidelines. The Plan must be flexible to account for adjustment of controls as necessary to meet field conditions.

One of the best ways to minimize erosion potential is to phase construction in order to minimize unstable areas. The Plan must be flexible to account for adjustment of controls as necessary in to meet field conditions. At a minimum,

the plan must include interior controls appropriate to different phases of construction.

The Plan must demonstrate that the post-construction stormwater treatment system has been designed with a goal of 80% removal of total suspended solids, pursuant to General Permit Section 6(b)(6)(C)(iii)1). A detail of both retention ponds and drainage calculations must be provided as well as a description of measures installed to manage stormwater from areas that do not drain to the pond.

This project has significant slopes and numerous wetland areas to be protected, which will make ongoing inspections and adjustments of controls an important aspect of this project. The permit (Section 6(b)(6)(D)) requires inspections of all areas at least once every seven calendar days and after every storm of 0.1 inches or greater. The plan must also allow for the inspector to require additional control measures if the inspection finds them necessary, and should note the qualifications of personnel doing the inspections. In addition, the plan must include monthly inspections of stabilized areas for at least three months following stabilization.

Section 6(b)(6)(C)(ii) of the permit requires the plan to address dewatering wastewaters which this site may generate. The plan does not include any provisions for dewatering, which may be necessary on the lower portions of this site.

As the plans provided did not include erosion and sedimentation controls, the Team stormwater specialist cannot comment on that issue at this time. However, due to the scope of the project and the site constraints, the potential for problems, particularly during construction, is high. A far more detailed review than is appropriate for this report will be conducted prior to issuance of any Department stormwater permit.

The Natural Diversity Data Base Review

The Natural Diversity Data Base maps and files regarding the project area have been reviewed. According to our information, there are extant populations of State Special Concern *Heterodon platirhinos* (Eastern hognose snake), *Terrapene carolina* (Eastern box turtle), *Thamnophis saurutus* (Eastern ribbon snake) and *Caprimulgus vociferus* (whip-poor-will) that occur in the vicinity of this project.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Natural Resources Center's Geological and Natural History Survey and cooperating units of DEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the Data Base should not be substitutes for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Data Base as it becomes available.

Also be advised that this is a preliminary review and not a final determination. A more detailed review may be conducted as part of any subsequent environmental permit applications submitted to DEP for the proposed site.

Vegetation Review

The ±78 acre parcel proposed for subdivision may be divided into several broad vegetation categories. These include Mixed Hardwoods, Hardwood Swamp/Wetland, Softwoods/Hardwoods, Old Field, Open Field and Conifer Plantations. Below are brief descriptions of each of these vegetation categories. The location and acreage of these areas were obtained from 1995 aerial photographs and are only approximate. They are depicted on the Forest Vegetation Map (Figure 4). The field inventory of vegetation types was conducted in March and May 2000. A more comprehensive inventory of the herbaceous vegetation, which is present in each of these categories, should be made at different times throughout the year by a botanist.

Most of the forested portions of this tract have evolved from abandoned pastureland. Some portions of the property have a history of past harvesting. The hemlock which are present throughout most of the property are infested with the Hemlock Woolly Adelgid. This insect may cause widespread hemlock mortality which will significantly alter the species composition of the portions of the forest where hemlock is presently found.

A. Mixed Hardwoods

The Mixed Hardwood type totals approximately 29 acres and is dispersed throughout the property. This type is dominated by reasonably healthy pole size trees (5" to 11" in diameter at breast height (d.b.h.)) which range from 60 to about 100 years of age. In some areas these trees are somewhat crowded and beginning to decline in health and vigor. Some larger and older trees are present but they are few in numbers and widely scattered. The overstory in this vegetation type is dominated by black birch, red maple, black oak, red oak, scarlet oak, and white oak with American beech, yellow birch, tuliptree, white ash, sugar maple

sassafras, shagbark hickory, pignut hickory, mockernut hickory, eastern red cedar, white pine and eastern hemlock mixed in. Red maple, white ash, yellow birch, tuliptree and hemlock dominate where the Mixed Hardwood type makes a transition to the Hardwood Swamp/Wetland type. The understory vegetation which is present throughout includes hardwood tree seedlings, flowering dogwood, maple-leaved viburnum, hophornbeam, American hornbeam, azalea, beaked hazelnut, American chestnut sprouts, witch-hazel, highbush blueberry, spice bush, sweet pepperbush, barberry*, bittersweet* and occasional multiflora rose*. Ground cover vegetation includes poison ivy, Virginia creeper, green briar, raspberry, grape, rattlesnake plantain, Canada mayflower, wild sarsaparilla, bluets, wood aster, club moss, evergreen wood fern, hayscented fern, bracken fern, sensitive fern, Christmas fern and many other species of grasses, sedges and wild flowers.

B. Hardwood Swamp/Wetland

There are approximately 14 acres of the Hardwood Swamp/Wetland vegetation type present within this parcel. Included are three small ponds, which total less than two acres. The vegetation which is present is somewhat variable however trees smaller than pole size are dominant with larger size classes present but not numerous. Each wetland is dominated by red maple and may include occasional yellow birch, black gum, white ash, sugar maple, American elm and hemlock. Young seedling and sapling size trees and a dense shrub layer dominate the wetlands, which are located adjacent to the small ponds. Shrub species that are present include spice bush, speckled alder, sweet pepperbush, American hornbeam, highbush blueberry, arrowwood, swamp azalea, button bush, winterberry, witch hazel, barberry*, and multiflora rose*. Skunk cabbage, false hellebore, tussock sedge, club moss, sphagnum moss, poison ivy, Virginia creeper, green briar, raspberry, cinnamon fern, Christmas fern, sensitive fern, evergreen wood fern, royal fern, steeplebush, meadowsweet, Canada mayflower, wild geranium, wild sarsaparilla, aster spp., sedges and other wild flower species are present as ground cover.

C. Softwoods/Hardwoods

Approximately 11 acres of the Softwoods/Hardwoods vegetation type are present within this parcel. Between 40% and 60% of this vegetation type is made up of seedling to small sawtimber size eastern hemlock with black birch, red maple, yellow birch, tuliptree, sugar maple, white ash, sassafras, American beech, shagbark hickory, mockernut hickory, pignut hickory, red oak, black oak and white oak intermixed. Many of the hemlock which are present are infested with the Hemlock Woolly Adelgid and appear to be declining in health and vigor. Understory vegetation is light where the hemlock are lightly infested and cast dense shade. In areas where the adelgid infestation is severe, causing the hemlock to decline, the understory is moderate and includes hemlock seedlings, hardwood tree seedlings, highbush blueberry, witch-hazel, maple leaved viburnum, hophornbeam and American hornbeam. Multiflora rose* and barberry* have become established in some of the more open areas. Poison ivy, club moss, Christmas fern, hayscented fern, Canada mayflower, spotted wintergreen, grasses and sedges were observed as ground cover where filtered sunlight reaches the forest floor.

D. Old Field

The Old Field vegetation type occupies about 11 acres of this site and may be found in several locations. The vegetation which is present in these areas is variable. This is primarily due to soil moisture differences and the timing of the establishment and spread of hardwood and softwood trees and shrubs. Eastern red cedar are present with red maple, flowering dogwood, black cherry, choke cherry, apple, crab apple, gray birch, gray-stemmed dogwood, sugar maple, black oak, red oak, quaking aspen, speckled alder, highbush blueberry, multiflora rose*, autumn olive*, barberry*, winged euonymus*, maleberry, arrowwood, Tartarian honeysuckle*, Japanese honeysuckle*, smooth sumac and staghorn sumac. Ground cover vegetation is comprised of grasses, sedges, poison ivy, Virginia creeper, bittersweet*, poke weed, goldenrod, ragweed, raspberry, cinquefoil,

sensitive fern, Queen Anne's lace, milkweed, thistle, ox-eye daisy, daisy fleabane, black-eyed Susan, spirea, meadowsweet and other wildflower and weed species.

E. Open Fields

The Open Field vegetation type makes up about 11 acres of this parcel. These areas are either being grazed by cows or are being mowed periodically to keep hardwood vegetation under control. The vegetation which is present in these areas is dominated by grasses, sedges, poison ivy, vetch, cleavers, cinquefoil, clover, white clover, goldenrod spp., Queen Anne's lace, daisy fleabane, ox-eye daisy, black-eyed Susan and milkweed. Multiflora rose* and autumn olive* are becoming established in some areas.

F. Conifer Plantation

Several small patches of pole size white pine, northern white cedar and Japanese yew are present within this tract. These areas total approximately two acres. On the edges of these areas where sunlight reaches the forest floor grasses, poison ivy, Virginia creeper, barberry* and red maple seedlings are present as ground cover.

**Invasive exotic vegetation has become established on some of the review site especially in openings. Of special concern are several invasive plant species, which have the potential to become major components of the ecosystem by out competing native species. These include barberry, multiflora rose, winged euonymus, bittersweet, Tartarian honeysuckle, Japanese honeysuckle and autumn olive. Although some of these species provide wildlife with food and cover, they are aggressive competitors with native plant species. In some areas the presence of one or more of these species may precluded the establishment of other more desirable native plant species. Mechanical removal or chemical control of these plants is effective but will become more difficult as they become more widespread.*

Figure 4.

FOREST VEGETATION MAP

NORTH

▲

SCALE 1"=1000'

LEGEND

PROPERTY BOUNDARY

VEGETATION BOUNDARY

PAVED ROAD

PONDS (2+-ACRE)

STREAM

VEGETATION TYPES

A. Mixed Hardwoods..... 29+- ACRES

B. Hardwood Swamp/Wetland... 14+- ACRES

C. Softwoods/Hardwoods..... 11+- ACRES

D. Old Field..... 11+- ACRES

E. Open Field..... 11+- ACRES

F. Conifer Plantation..... 2+- ACRES

Limiting Conditions/Potential Hazards

At this time hemlock are present on approximately 25% of this property. All of the trees that were sampled regardless of size or location were infested with the Hemlock Woolly Adelgid. The Hemlock Woolly Adelgid is a small aphid-like insect that feeds on young Eastern Hemlock twigs during all seasons of the year with the greatest damage occurring during the spring. The loss of new shoots and needles seriously impairs the hemlock's health and vigor. The Adelgid is dispersed by wind, birds and mammals and is at the present time almost impossible to control in a forested environment. Cultural and chemical control methods have proven to work well in ornamental landscapes. Biological control agents such as the Asian ladybird coccinellid beetles show promise, but widespread availability and use is probably many years off.

Defoliation and resulting mortality can occur within several years after infestation. Infested hemlock die at different rates and deteriorate quickly after death. Although standing dead hemlock provide excellent foraging and cavity-nesting habitat for many species of birds they do create problems. Dead hemlock trees not only pose a direct threat to people and property; they may also pose a long-term wild fire hazard and are generally not aesthetically pleasing.

Potential hazards throughout the property include dead trees, dead tree parts and those trees whose roots or trunks have a high probability of falling due to excessive decay or lean. These trees become hazard trees if there is a high probability of them falling and injuring people or damaging property. All trees with the above-mentioned characteristics would be hazardous if located within striking distance of a structure or along areas of high use such as roads or yards.

The creation of openings in the forest (from building roadways and clearing house lots) will increase the susceptibility of the trees to windthrow at the leeward edge of the openings. Trees adjacent to or in openings that are created on

soils with high moisture content or on windward slopes will have the greatest risk for windthrow. These newly exposed trees are also susceptible to ice, snow and wind storms, which may cause considerable crown breakage.

Construction activities that occur too close to trees that are to be retained will adversely effect their health, vigor and longevity and potentially create future hazard trees. Trees are very sensitive to the condition of the soil within the entire area of their root systems, which generally extends well beyond the spread of their crowns. Excavation, filling and the general use of heavy machinery will lead to some degree of soil compaction that will adversely affect the soil moisture and aeration balance. This imbalance could lead to a decline in tree health and vigor and may even lead to tree mortality within three to five years. Physical damage to the root system (by excavation) or bark damage may allow the introduction of decay organisms, which may result in the decline of tree health over time. The older and/or larger a tree is, the more readily it is affected by the negative impact of construction related activities. The delayed effect of construction activities on trees can create future problems that are expensive to rectify once utilities, roads, septic systems and homes are in place.

Aesthetic Considerations

The forested lots and proposed conservation land should provide many of the rural amenities for which many home buyers are looking. The aesthetics of a forest depends upon numerous characteristics of the individual trees, the forest as a whole and the landscape. Some of these characteristics include: size of the trees, density of the forest, variety of forest scenes, unique or interesting features, amount of dead and down woody material, depth of view into the forest, and visual attractiveness of the bark texture and leaf and flower color. Generally, forests with large trees and a deep unobstructed view into the woods are most desirable. The larger trees that are present, especially if they are reasonably

healthy, should be retained and protected as "standards" for their aesthetic and wildlife value.

Management Considerations

The maintenance and development of healthy vigorous trees and forests should be considered in the development of this property. In addition to the environmental and aesthetic amenities they provide, the presence of healthy trees increases the value of house lots. A reconnaissance of the trees on the individual house lots should be performed in conjunction with laying out the construction site in order to identify the best trees to be retained. The trees to be retained should be healthy, free of decay and preferably a long lived species such as red oak, white oak, hickory, sugar maple and American beech. Other species are acceptable if they are healthy and not prone to insect infestation or disease. These trees may be retained in groups or "islands" to reduce the impact of soil disturbance and mechanical injury.

Both individual trees and "islands" of trees can be designated for retention with vinyl flagging or fencing prior to construction so that tree injury may be avoided. No excavation, filling or driving of heavy equipment should be permitted within 25-50 feet (depending on tree diameter - the larger the tree to be retained the greater the no disturbance area should be) of single trees or groups of trees. Another general rule is no excavation, filling or heavy equipment should be permitted within two times the radial spread distance of the retained tree's crown. Finally, trees left on site around houses should be away from the house at least for a distance equal to the height of the tree.

The negative effect of construction on trees is not usually visible at the time the work is done. Soil compaction, root injury, and scraped bark are stressors that contribute to insects and diseases infesting the tree long after machinery has left the sight. This creates hazards and problems for homeowners as trees die several

years after construction. These problems can be minimized or eliminated when proper care is taken with vegetation during the construction period.

During construction, when making grade cuts, trees should be removed back from the cut for at least a distance of two feet for each one-foot of depth of cut, e.g. 20 feet back for a 10-foot cut. Where feasible roads, driveways, houses and septic systems should be relocated slightly in the field to protect healthy, highly aesthetic trees which are going to be retained.

Tree and vegetation clearing and removal will take place on a significant portion of the proposed subdivision. The sawtimber size trees (11.1" in diameter at breast height (d.b.h.) and larger) even though they are generally of low value and the pole size trees (6.1" to 1 1" in d.b.h.) that are going to be removed should be utilized as sawlogs and fuelwood rather than chipped and removed at a cost to the developer.

Water Quality and Forest Management

Healthy woodlands provide a protective influence on water quality. They stabilize soils, reduce the impact of precipitation and runoff and moderate the effects of adverse weather conditions. By so doing, woodlands help to reduce erosion, sedimentation, siltation and flooding. Research has shown that soil protected by the cover of leaf litter and humus associated with woodland areas contributes little or no sediment to streams.

Improper and careless harvesting of timber for development or commercial purposes may, however, lower water quality in several ways: 1) Erosion, siltation and sedimentation caused by improperly located and improperly constructed access roads, skid trails, yarding areas and stream crossings; 2) Siltation and sedimentation caused by logging debris left in streams, interfering with natural flows; 3) Thermal pollution resulting from complete or partial harvesting of

streambank vegetation, eliminating shade; 4) Chemical pollution caused by improper application of herbicides and insecticides (it should be noted, however, that in Connecticut the widespread use of chemicals in forest management is not prevalent and therefore does not constitute a great threat to water quality at this time); 5) Influx of nutrients caused by the application of fertilizer, soil conditioners and wetting agents (used in forest fire control).

In 1979, a field study and analysis of timber harvesting operations in Connecticut revealed no significant contribution to the degradation of water quality. However, this study did identify sedimentation resulting from erosion as a principal potential problem. Felling trees does not generally cause erosion. Approximately 90% of sedimentation from harvesting operations originates from exposed soil on logging roads, skid trails and yarding areas. Most erosion and sedimentation associated with woodland harvesting activities occurs during and immediately after harvesting. The basic principles of erosion control needed to reduce or avoid damage to the environment include:

1. Disturb as little land as possible.
2. Use erosion control measures to protect disturbed areas.
3. Reduce the speed and volume of runoff.
4. Divert runoff from disturbed areas.
5. Install perimeter controls around disturbed areas.
6. Conduct conscientious maintenance of erosion controls.
7. Assign someone the direct responsibility of implementing and maintaining erosion control measures.

For more in-depth information please see "TIMBER HARVESTING AND WATER QUALITY IN CONNECTICUT; A Practical Guide for Protecting Water Quality While Harvesting Forest Products." Prepared by: Connecticut RC&D Forestry Committee, 1990. (Soon to be reprinted). This publication and additional

technical advice and information on best management practices, forest products harvesting or other aspects of forest management may be obtained from:

State Forester's Office
79 Elm Street
Hartford, CT 06106
(860) 424-3630

Conclusion

Trees and forests have value in reducing climatic extremes, controlling runoff, filtering out pollutants from the air and water, reducing noise, providing aesthetic enjoyment, creating wildlife habitat, recharging aquifers, supplying wood fiber and functioning as a carbon sink. Healthy forests provide these long-term amenities. Therefore a good relationship between development and the retention of forested open space is essential if generations to come are to enjoy a high quality of life. Trees around houses can be healthy, long lived and valuable if treated properly in the conversion from unbroken forest to residential subdivision.

Archaeological Review

A review of the State of Connecticut archaeological site files and maps, shows no known archaeological sites directly in the project area; however, there are 12 archaeological sites in close proximity to the project area which testifies to its overall sensitivity for undiscovered archaeological remains. The sites that are recorded include seven (7) Native American sites dated as early as 7,000 years ago. These would have been campsites associated with a series of interior wetlands to the east of the project area. The other five remaining sites are industrial and colonial sites including the remnants of old mills and farmsteads.

The Office of State Archaeology highly recommends an archaeological survey of the project area. This survey would identify and locate any below ground archaeological resources in order avoid or recover any information about the history of East Hampton. The Office of State Archaeology is prepared to offer any technical assistance to the property owner in conducting this survey.

Planning Review

Eastwood subdivision is a proposed link south of the Comstock Ridge subdivision via Comstock Trail and Sillmanville Road. An ERT report was produced for Comstock Ridge in August 1998. Most of the comments from that report have been incorporated into the Eastwood proposal. The stone walls have been incorporated into the landscape in an aesthetically pleasing manner as they are very close to the rear property lines of lots 1-3, 9, 10, 13-15, 27-32. The existing tree lines are also incorporated into the subdivision design promoting their aesthetic value as suggested in the Comstock Ridge report. The proposed Eastwood subdivision is an aesthetically appropriate design for this parcel.

Comstock Trail would be extended from Water Hole Road through Eastwood to reach Sillmanville Road, rather than North Moodus Road. This design avoids a large wetland crossing near North Moodus Road. There is easy access to Route 16, a rural main arterial, to the north of the subdivision. Eastwood is also close to Routes 149, 151, and 196, all classified as rural major collectors.

The 1997 Trip Generation Manual, produced by the Institute of Transportation Engineers, allows an average weekday trip rate per dwelling unit to be 9.57. The trip rate is slightly higher on Saturdays and lower on Sundays. This would mean Eastwood would generate approximately 278 additional trips, with an average of 139 trips entering the subdivision and 139 exiting the subdivision on any given weekday. Weekday peak volumes would occur during the morning and evening commute times. The a.m. peak hour would generate approximately 22 vehicle trips with 6 vehicles entering and 16 vehicles exiting Eastwood. The p.m. peak hour would generate approximately 30 vehicle trips with 19 vehicles entering and 11 exiting the subdivision. These figures do not include any additional traffic generated by Comstock Ridge.

Wetland impacts appear to be minimal and a 100-foot buffer zone is shown on the plans. Consideration should be given to making the buffer zone a conservation easement, delineated on the lots where applicable, so the home owners know its boundaries. The largest wetland expanse is preserved as a 16.36 acre conservation open space area which is an asset to the subdivision.

Primary issues of concern include the location of the proposed retention basin which is shown directly in the back yard of the house on lot 4, and drainage south of lot 29. Consider revising lot 4, and possibly lot 3, since selling a lot with a retention basin on it will be difficult. Also, revise the drainage plan south of lot 29, where the storm water has no place to go but out to Sillmanville Road due to the slope in this area.

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: 860-345-3977, Eastern Connecticut RC&D Area, P.O. Box 70, Haddam, Connecticut 06438.