Fallon Subdivision
Calvin French Road
Sterling, Connecticut

Eastern Connecticut Environmental Review Team Report

Eastern Connecticut
Resource Conservation and Development Area, Inc.

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Calvin French Road
Sterling, 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

Inland Wetland Commission
Sterling, Connecticut

Report #608

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Acknowledgments

This report is an outgrowth of a request from the Sterling Inland Wetland Commission to the Eastern Conservation District (ECD) and the Eastern Connecticut Resource Conservation and Development Area (RC&D) 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, September 19, 2006.

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I would also like to thank Joe Theroux, wetlands agent for the Town of Sterling, Christopher Fallon, landowner and applicant, Norman Thibeault and Greg Glaude, Provost and Rovero, project engineers 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 able to view additional maps and plans. Some Team members made separate or follow-up visits to the site, while others conducted a map review only. 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. This report identifies the existing resource base and evaluates its significance to the proposed use, 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 the proposed subdivision application.

If you require additional information please contact:

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Introduction

Introduction

The Sterling Inland Wetland Commission has requested Environmental Review Team (ERT) assistance in reviewing a proposed residential subdivision.

The project site is approximately 40 acres in size located on the east side of Calvin French Road, approximately 2,500 feet south of Sawmill Hill Road. The easterly boundary is defined by Quandock Brook. The site is currently wooded with several small wetlands which are part of a larger off-site wetland complex to the south. The site generally slopes and drains to off-site wetlands to the south and Quandock Brook to the north and west.

The subdivision includes eleven (11) residential building lots with on-site water supply wells and sewage disposal. A new road will be constructed (approximately 1,350 feet in length) that ends in a cul-de-sac. There is a proposed conservation easement along the brook. The roadway drainage system has been designed to accommodate the 25-year storm event. In general, the roadway has been designed along an existing topographic ridge to minimize the amount of runoff entering the roadway drainage system. The southern portion of the roadway will drain to Quandock Brook through a rip-rap swale from the cul-de-sac. The terminal end of the swale includes a riprap and stone structure to filter roadway runoff and retain sediment prior to the eventual discharge to Quandock Brook.

Objectives of the ERT Study

The town has requested the ERT to assist in a review of the project because of concerns raised at the public hearing regarding possible impacts to Quandock Brook. Major concerns include: stormwater drainage/management, erosion and sediment control, water quality and wetlands and impacts to the fisheries habitat.

The ERT Process

Through the efforts of the Sterling Inland Wetland Commission this environmental review and report was prepared for the Town of Sterling.

This report provides an information base and a series of recommendations and guidelines which cover the topics requested by the town. Team members were able to review maps, plans and supporting documentation provided by the applicant.

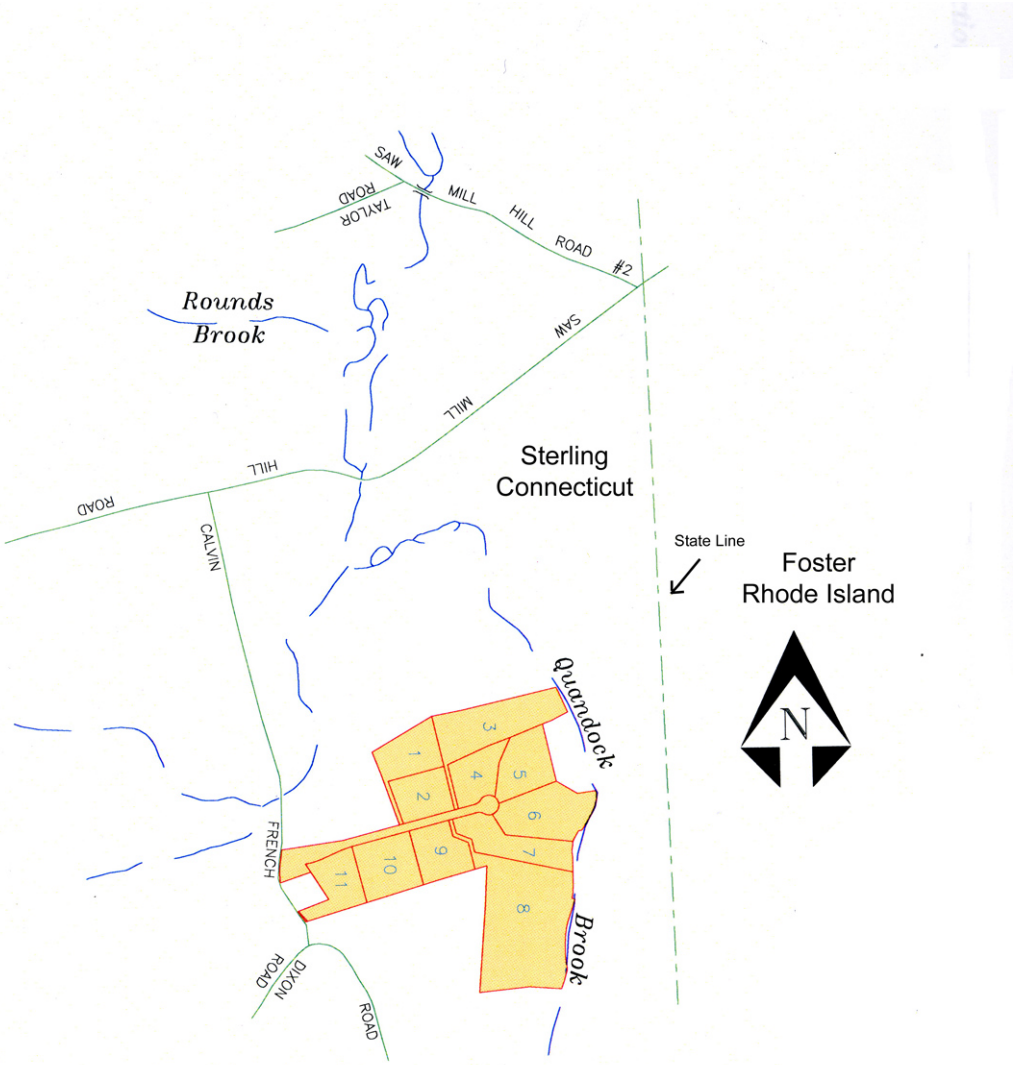
The review process consisted of four phases:

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 Tuesday, September 19, 2006 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.

Location Map



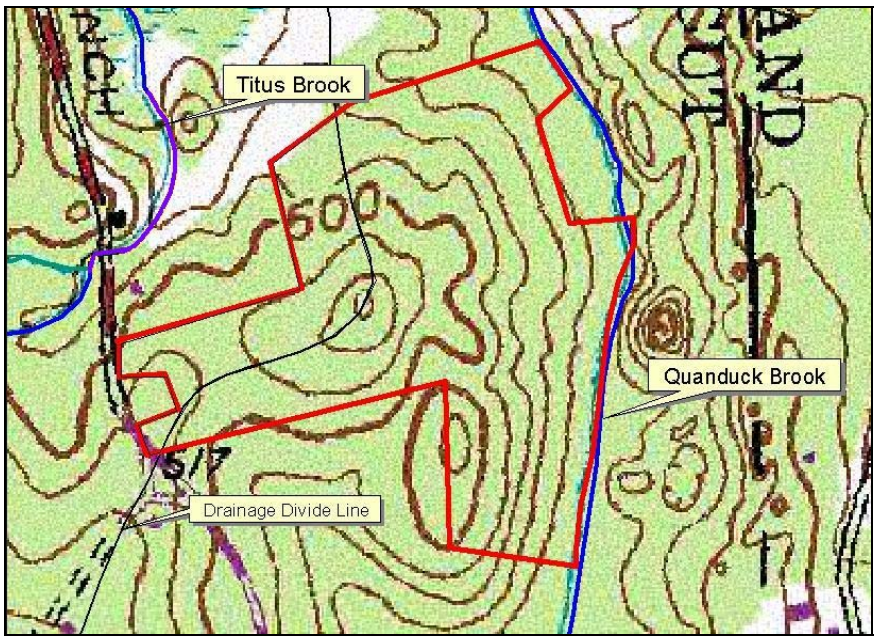
Topo Map

Aerial Photo

Wetland Review

This is a ~42 acre site with eleven homes planned. The parcel is located in the northeast corner of Sterling about 400 feet west of the Rhode Island line.

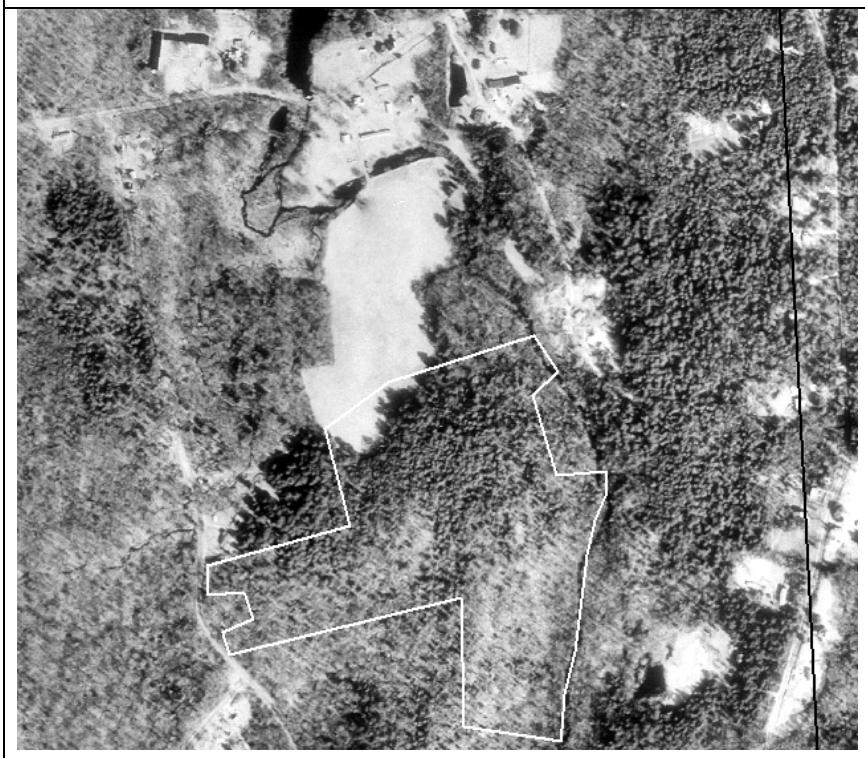
Two watersheds drain the parcel. Approximately eight acres, or nineteen percent, drains west into Titus Brook. The balance, or about 34 acres, drains to the east, downslope towards Quandock Brook. The parcel shares ±1,500 feet of common boundary with the brook.



The proposed development is a straightforward project consisting of a ~1,300 foot main road entering the property from Calvin French Road and terminating in a cul-de-sac. Proposed lots radiate from the road and road end. The completed homes will be supported by on-site wells and septic systems. Lot sizes range from ~ two acres to 9.5 acres, averaging ~2.75 acres each.

At the time of the field review the main road was being roughed in - cleared of trees and large rocks. The Team observed the work, visited the wetlands on lots 9, 10 and 11, walked down the slope to Quandock Brook and, finally, observed the current road

drainage along Calvin French Road. Before being roughed out, the property was predominantly forested.

	*In this spring-1934 aerial photograph the parcel can be seen as totally wooded. This photo was taken after the snow melt and before leafout.*
	*This is the same area in the early 1990s. It shows the approximate outline of the parcel boundary.*

Comments

Quandock Brook: three lots (#6, 7, and 8) that front the brook will be buffered from it by a conservation easement that ranges in width from ~140 feet to 300 feet. This distance is very suitable to protect and preserve the resource both during the construction and long after. Lot #3 also contains brook frontage and should be protected with an easement as well.

A drainage easement is proposed between lots 6 and 7. The stonewall stormwater filter system will terminate approximately 140 feet upslope from the Brook. The design of this filter, in combination with the distance from the brook and the rough, heavily vegetated surface the runoff will travel over will have the desired filtering, as well as sediment and nutrient removal before the runoff enters the brook. The Team rarely sees the combination of distance, vegetation, rough surface and design in the protection of water quality.

Quandock Brook is the quintessential New England waterway. Healthy in its ecology and pleasing to the eye, construction within the bounds of the plan allows for the completion of the proposal with no impact to the stream.

Other wetlands are found on lots 9, 10 and 11. Those wetlands are defined almost solely by soil type. Visually, the subtle changes in vegetation would not be indicative of being a wetland to the casual observer.

That said, all wetlands are still protected equally under the law, and they have been on the proposed plans dated 10-6-06. The design combination of 150+ foot long, sunken, grass-lined level spreaders, and crushed stone check dams will be sufficient to control the runoff from both the footing drains and the road.

Team members review plan proposal on the wetland soils in the area of proposed lots 9 and 10.

Other Issues

Calvin French Road Drainage

Approximately 160 feet of the new subdivision road will drain downslope to Calvin French Road. Concerns have been raised about the flows along side of the road. While the engineers can/will have figured out the flow calculations, the wetlands concern is one of sediment loading further down along the flowpath.

As it exists now, road runoff travels along the swale beside the road and passes into a corrugated metal pipe. This passes the flow under the road and releases it into the wetland on the opposite side of the street.

The proposal calls for a catch basin to be installed at the pipe inlet. This will feature a minimum two foot sump or sediment collection basin. That should very effectively cut down on the amount of road sand and salt that is currently carried under the road and deposited into the wetland across the street.

These photographs show the metal culvert inlet that carries untreated stormwater under the road and deposits it into the wetland across the road where the three Team members are inspecting. The pro-posed catch basin will help to minimize this wetland sediment and road salt loading.

Summary

This proposal has done well to protect the wetlands and watercourses on the property. The soil stockpiles are delineated and the stacked haybale systems are easily visualized on the drawings.

* One of the priority concerns is to preserve the integrity of the Brook as it exists now. In that respect, the plan's proposal does this very well through the width of the conservation easement and the overland distance the runoff must travel to the watercourse.

* Sediment and erosion control structures must be well maintained throughout the course of construction right up through the vegetative stabilization of the bare surfaces. This is especially important in areas of steeper slopes where grading will occur and soil moved from one location to another.

* The foot print of houses and driveways, as well as the septic fields and wells are depicted on the drawings dated 10-6-06. Construction should follow these plans to ensure the integrity of the erosion and sediment control efforts.

Eastern Conservation District Review

Based on the District (ECCD) review of the materials provided and their inspection of the site, it is ECCD's position that this project can be constructed without causing significant negative impacts to the natural resources in the area. However, this position is based on the premise that best management practices will be utilized in all phases of the project. Below they have listed specific concerns/recommendations which they are providing for consideration by the Town in the interest of further minimizing the impacts of this project.

Conservation Easements

ECCD strongly supports the conservation easements proposed for Lots 6, 7, and 8. These easements will provide considerable protection for Quandock Brook. However, Lot 3 also borders the brook, but a conservation easement has not been proposed. We recommend that a conservation easement be established on Lot 3 similar to those on the other lots adjoining Quandock Brook.

Stormwater Management

Recent studies have shown that the negative impacts of stormwater leaving developed property can be greatly reduced using various techniques. Connecticut DEP has recently published the "Stormwater Quality Manual", which details many of these techniques. ECCD recommends that the conveyance of stormwater from this project be re-evaluated based on the DEP manual. Specifically, they recommend that swales be used to convey stormwater wherever possible instead of using pipes. The intent is to increase on-site infiltration of stormwater, and to decrease the quantity and rate of stormwater leaving the site. Stormwater infiltration spread out over a larger area (via swales) also helps improve the quality of stormwater leaving the site. ECCD supports the project's proposed use of the level spreaders to slow and infiltrate stormwater, however, the additional use of grass swales before the stormwater reaches these measures would enhance the system.

Erosion and Sedimentation Control Plan

The E&S Plan submitted appears to be adequate for reviewing this proposed subdivision. However, when actual construction begins, decisions will need to be made at the site as to how best to install the E&S measures. If this project is constructed, ECCD recommends that the Town have a knowledgeable inspector work with the contractor to ensure that effective E&S measures are properly installed and maintained.

Stormwater Management Review

Stormwater Permitting

Since the site development involves the disturbance of five or more acres of land, the developer must submit a registration for coverage under the DEP's *General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities* (general permit) issued 10/1/02 and modified 4/8/04. The registration must be submitted *at least* thirty days before the start of construction activities. If 10 or more acres of land will be disturbed, regardless of phasing, the developer must also submit the Stormwater Pollution Control Plan (the "Plan") prepared in accordance with Section 6(b) of the general permit. The general permit requires that the "Plan shall ensure and demonstrate compliance with the Connecticut Guidelines for Soil Erosion and Sediment Control (the "guidelines"). The registrant must comply with the requirements of the Plan, and maintain the Plan on site during construction. Once construction begins, if the erosion and sediment controls identified in the Plan are not sufficient for the circumstances, the registrant must amend the Plan and take all necessary steps to protect the waters of the state from pollution. Please note that many erosion, sediment control, and stormwater detention issues must be dealt with on a local level before being included in the Plan.

The registrant must provide a copy of the Plan to all contractors or developers conducting activities that may affect stormwater runoff during construction, including all contractors conducting activities that may affect stormwater runoff from individual lots within the overall plan of development, regardless of ownership. These additional contractors and developers must sign the contractor certification found in Section 6(b)(6)(E) of the general permit.

Site Development Plan

A development plan (plan) and Drainage Design Report, both dated June 2006 as revised to September 2006, prepared by Provost & Rovero, Inc., were provided for the ERT. Review of these items resulted in the following comments:

- The development plan identifies specific erosion and sediment controls proposed for roadway construction and individual lot development. However, the plan must also include specific controls to be in place during the installation of the grass lined level spreaders, the riprap swale and the associated drainage piping.

- The plan must ensure that stabilization measures be installed and maintained until permanent vegetation is well established in the grass lined level spreaders.

- It is recommended that arrangements for street sweeping during individual lot development be required.

- Section 6(b)(6)(D) of the general permit requires that erosion and sediment controls be inspected at least once a week and within 24 hours of the end of a storm that is 0.1 inches of rainfall or greater in accordance with the construction stormwater general permit. These inspections and any necessary maintenance of the erosion and sediment controls are to be documented in weekly inspection reports.

- Soil stabilization measures must be implemented within three days of reaching final grade or when construction activities have permanently ceased or are temporarily suspended for more than seven days. Areas that will remain disturbed but inactive for 30 days, including stockpiles, must receive temporary seeding in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control (Guidelines).

- If dewatering is anticipated, the development plan must describe how such waters will be handled to prevent the discharge of sediment into wetlands and watercourses.

Section 6(b)(6)(C)(ii) recommends that dewatering wastewater be infiltrated into the ground where feasible.

- Has there been any evaluation of the potential for flooding at the low spot identified in Lot #7 that also includes part of the driveway for Lot #8?

- A detail with grading must be provided for the riprap and stonewall filter proposed at the terminus of the riprap swale. Is this area intended to act as a level spreader? Does the developer have experience with the long term functioning of the stonewall filter? What happens to the wall after the stakes and silt fence decay?

- For areas such as the grass lined level spreaders and the riprap swale, the 2004 Connecticut Stormwater Quality Manual recommends at least two inspections during the first year post-construction, and annually thereafter. The inspections should confirm that the flow through the level spreader is not short-circuiting and causing erosion, and to evaluate for sediment buildup and the overall health of the vegetation. Areas down slope of the level spreaders and the riprap/stone filter wall must also be inspected for the development of concentrated flow paths and erosion, and repairs made as necessary. The development plan must identify inspection and maintenance schedules for the grass lined level spreader as well as the riprap swale, and identify the parties responsible for long-term maintenance of these structures.

Fish Resources Review

Quandock Brook

Quandock Brook, a tributary of the Moosup River, runs along the eastern portion of the property. This perennial watercourse stream supports a viable coldwater fish community that is known to support a healthy and robust native brook trout population. Brook trout typically spawn in Connecticut during the month of October. Eggs incubate within gravel over the fall and winter periods with eggs hatching in late February or early March. Fry remain in the gravel until their yolk sacs are absorbed at which time the fry emerge from underneath the gravel and move into preferred stream microhabitats. Realizing the importance of brook trout and their habitats, a unique partnership is now underway between state, federal, and local agencies, academia, as well as non-profit government organizations and private citizens called the Eastern Brook Trout Joint Venture (EBJTV). As part of the National Fish Habitat Initiative, this venture is a geographically focused, locally driven scientifically based effort with goals to protect, restore, and enhance aquatic habitat throughout the eastern range of brook trout. More can be learned about these efforts at www.fishhabitat.org. Quandock Brook also supports other stream species such as blacknose dace, longnose dace, fallfish, common shiner, tessellated darter and white sucker. The lower section of the stream near its confluence with the Moosup River also supports a "wild' (naturally reproduced) brown trout population.

Quandock Brook, adjacent to the proposed subdivision is of moderate gradient with an average width of 30 feet. Albeit variable, most mesohabitat is in the form of alternating stretches of riffle/run and shallow pool habitats. Streambed substrates are comprised of small to large size gravels and variable sized cobbles. Instream cover is in the form of medium to large size boulders, large woody debris either in the form of small jam units or single pieces and undercut streambanks. The stream is well shaded with a closed canopy.

Trees provide a valuable overhead canopy, which serve to shade the watercourse and reduce surface water temperatures from warming during the summer.

Surface water quality of Quandock Brook is classified by the Connecticut Department of Environmental Protection as Class B/A. Designated uses of Class B/A waters are as follows: potential drinking water supply, fish and wildlife habitat, recreational use, agricultural and industrial supply and other legitimate uses including navigation. The future goal is to improve water quality to meet a Class A designation.

A view looking upstream. (E. Sych)

Comments/Recommendations

It is the policy of the CTDEP Inland Fisheries Division (IFD) that riparian corridors be protected with a 100 ft. wide riparian buffer zone. A riparian wetland buffer is one of the most natural mitigation measures to protect the water quality and fisheries resources of watercourses. A copy of the IFD policy is available upon request. Subdivision design and development adjacent to Quandock Brook is consistent with CTDEP Inland Fisheries Division riparian corridor protection policy. The proposed conservation easement should be designed to protect the existing Quandock Brook riparian corridor from future clearing and other vegetative alterations and also allow public access for fishing.

The eastern portion of the subdivision roadway will ultimately drain to Quandock Brook via a riprap swale, approximately 280 feet in length that terminates at a riprap stone wall/level spreader structure comprised of a filter fabric core. It is designed to help filter stormwater runoff and sediments. To assist with reducing water velocities down the swale and further assist in the filtering of sediments, it is recommended that riprap low level check dams be constructed across the swale approximately every 50 feet. The stonewall structure needs to be monitored on a regular basis to ensure that it is "functional." No details were provided regarding the grade of the riprap adjacent to the stonewall terminus. It is possible that storm flows may migrate around the ends of the structure, thus, the developer should consider making a slight depression or basin in this area to allow sediments to deposit and collect before contact with the stonewall filter.

It is the experience of Team fisheries biologist's in Connecticut that the one of the most damaging impacts from stormwater runoff is the influx of roadway sands into watercourses as a result of winter roadway de-icing activities. These sands can fill in the interstitial spaces within a streambed impacting habitats for aquatic insect and fish life. To help mitigate for sand runoff into watercourses, the use of sand and sodium chloride road salt to de-ice paved surfaces should be minimized, catch basins should be cleaned on an annual basis and sands should be cleaned by street sweeping after the winter.

Opportunities exist in the stretch of Quandock Brook along the proposed subdivision to enhance instream fish habitats. If the Town of Sterling, the developer or private property owners along the brook are interested in exploring instream fish habitat enhancements, the Team's fisheries biologist is willing to further evaluate such opportunities. Enhancements are designed to emulate natural stream features and would likely involve adding features such as large woody debris, logs, and boulders. Collectively, these features will create instream cover and variations in channel depths, flow patterns and increase the quality and availability of fish and aquatic insect habitats.

The Natural Diversity Data Base

The Natural Diversity Data Base maps and files regarding the project area have been reviewed. According to our information, there are known extant populations of State Species of Special Concern *Terrapene carolina carolina* (Eastern Box Turtle) that occur in the vicinity of this project site.

Eastern box turtles require old field and deciduous forest habitats, which can include power lines and logged woodlands. They are often found near small streams and ponds, the adults are completely terrestrial but the young may be semi aquatic, and hibernate on land by digging down in the soil from October to April. They have an extremely small home range and can usually be found in the same area year after year.

If Eastern box turtle habitat exists on the proposed site, the DEP Wildlife Division recommends that a herpetologist familiar with the habitat requirements of this species conduct surveys between April and September to see if they are present. A report summarizing the results of such surveys should include habitat descriptions, reptile species list and a statement/resume giving the herpetologist's qualifications. The DEP doesn't maintain a list of qualified herpetologists. A DEP Wildlife Division permit may be required by the herpetologist to conduct survey work; you should ask if your herpetologist has one. The results of this investigation can be forwarded to the Wildlife Division and, after evaluation, recommendations for additional surveys, if any, will be made.

Please be advised that the DEP Wildlife Division has not made a field inspection of this project nor have they seen detailed timetables for work to be done. Should state permits be required or should state involvement occur in some other fashion, specific restrictions

or conditions relating to the species may apply. In this situation, additional evaluation of the proposal by the DEP Wildlife Division should be requested.

Natural diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. The 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.

Please 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.

Archaeological Review

The Office of State Archaeology (OSA) and the State Historic Preservation Office (SHPO) believe that the proposed project area possesses a moderate to high sensitivity for archaeological resources. This review is based on known prehistoric Native American sites in the State of Connecticut's archaeological site files and maps, and topographic and environmental characteristics of the land. Proximity to the wetlands to the east and the soil types and slope associated with the project area suggest a high probability for undiscovered archaeological resources.

The OSA and SHPO concur in the strong recommendation that a professional reconnaissance survey should be undertaken in order to locate, identify and evaluate all archaeological resources that may exist within the ERT study area. A reconnaissance survey would provide the Town of Sterling, OSA and SHPO with important cultural resource information for assisting in the local decision-making processes. All archaeological investigations should be carried out pursuant to SHPO's *Environmental Review Primer for Connecticut's Archaeological Resources.*

Their offices are available to provide technical assistance to the applicant and the Town of Sterling in conducting the recommended survey.

ABOUT THE TEAM

The Eastern Connecticut Environmental Review Team (ERT) is a group of professionals in environmental fields drawn together from a variety of federal, state and regional agencies. Specialists on the Team include geologists, biologists, foresters, 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, active adult, 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 and/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 Conservation District and the ERT Coordinator. A request form should be completely filled out and should include the required materials. When this request is reviewed by the local Conservation District and approved by the ERT Subcommittee, 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, e-mail: ctert@comcast.net