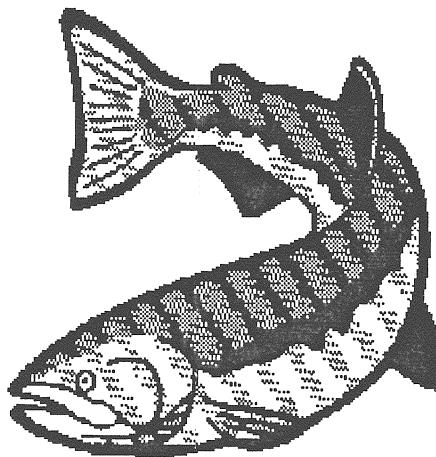
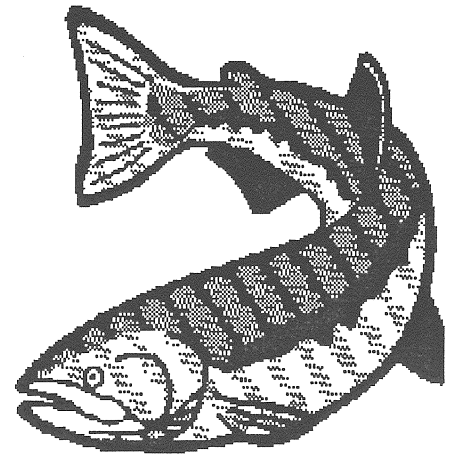
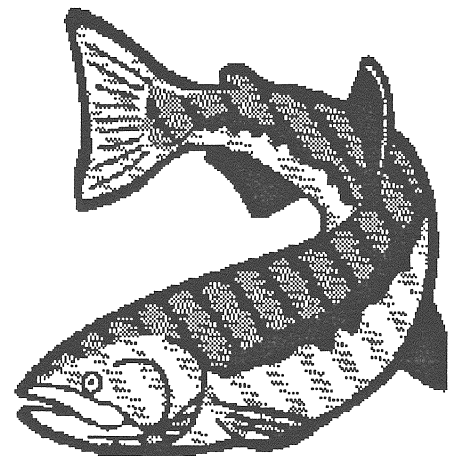


*PROPOSED
HOCKANUM RIVER BRIDGE
AT
HOCKANUM BOULEVARD
VERNON, CONNECTICUT*



*EASTERN CONNECTICUT
ENVIRONMENTAL REVIEW
TEAM
REPORT*



*PROPOSED
HOCKANUM RIVER BRIDGE
AT
HOCKANUM BOULEVARD
VERNON, 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
VERNON, CONNECTICUT*

DECEMBER 1999

*CT ENVIRONMENTAL REVIEW TEAMS
1066 SAYBROOK ROAD, P.O. BOX 70
HADDAM, CT 06438
(860) 345-3977*

ACKNOWLEDGMENTS

This report is an outgrowth of a request from the Vernon Planning and Zoning Commission to the Tolland 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 Wednesday, October 27, 1999.

David Askew	District Manager Tolland County Soil & Water Conservation District (860) 875-3881
Art Christian	Supervising Civil Engineer DEP - Bureau of Water Management (860) 424-3880
Wayne DeCarli	Transportation Planner CT DOT - Bureau of Policy and Planning (860) 594-2145
Douglas Hoskins	Wetland Specialist DEP - Inland Water Resources Division (860) 424-3903
Dawn McKay	Biologist DEP - Environmental & Geographic Information Center (860) 424-3592

Brian Murphy

Fisheries Biologist
DEP - Eastern District
(860) 295-9523

I would also like to thank George Russell, town planner, Tim Timberman, town engineer, Thomas Joyce, town economic development director, Budd Titlow, environmental consultant for landowner, Joseph Caposella, attorney for landowner, and Gardner Chapman, landowner, 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 plans and additional information. 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 potential 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 bridge.

If you require additional information please contact:

Elaine Sych, ERT Coordinator

CT ERT Program

P. O. Box 70

Haddam, CT 06438

(860) 345-3977

INTRODUCTION

INTRODUCTION

The Planning and Zoning Commission has requested assistance from the Eastern Connecticut Environmental Review Team in conducting an environmental review of the proposed bridge over the Hockanum River at Hockanum Boulevard.

The town is seeking a wetlands permit to construct a bridge over the Hockanum River at the extension of Hockanum Boulevard off of Route 83 to the Chapman parcel. The bridge would provide alternative access to three (3) parcels (Gerber/Chapman/Lyman parcels) of undeveloped private land which total 275 acres. The Town of Vernon contracted for a planning study (Final Report 2/99) of the area to determine the feasibility and adopt a strategy for the development of the site. The owner of the Chapman parcel has plans in the near future to submit an application for the development of his land and he wants access via the Hockanum Boulevard bridge.

The location of the crossing was chosen because it is at the narrowest wetland width in the area of concern. The town's bridge proposal plan consists of a series of three 12' x12' box culverts, wing walls, cutoff walls, gravel fill, roadway, curbing, drainage and sidewalk. An environmental consultant for the Chapman property owner has submitted a report on the wetlands, an impact assessment of the triple box culvert bridge crossing and recommendations for an alternative design. (See Appendix A)

OBJECTIVES OF THE ERT STUDY

The Commission requested the Environmental Review Team to assist them with an independent review and evaluation of the town's plans for the bridge location and design. Team members were able to discuss the project and view the site with town officials, the Chapman property owner and his attorney and environmental consultant.

THE ERT PROCESS

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

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

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 Wednesday, October 27, 1999. 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.

Location and Topographic Map

Scale 1" = 2000'





Figure 2.

Soils Map

Scale 1" = 1320'



Figure 3.

1999 Flood Insurance Rate Map (FIRM)

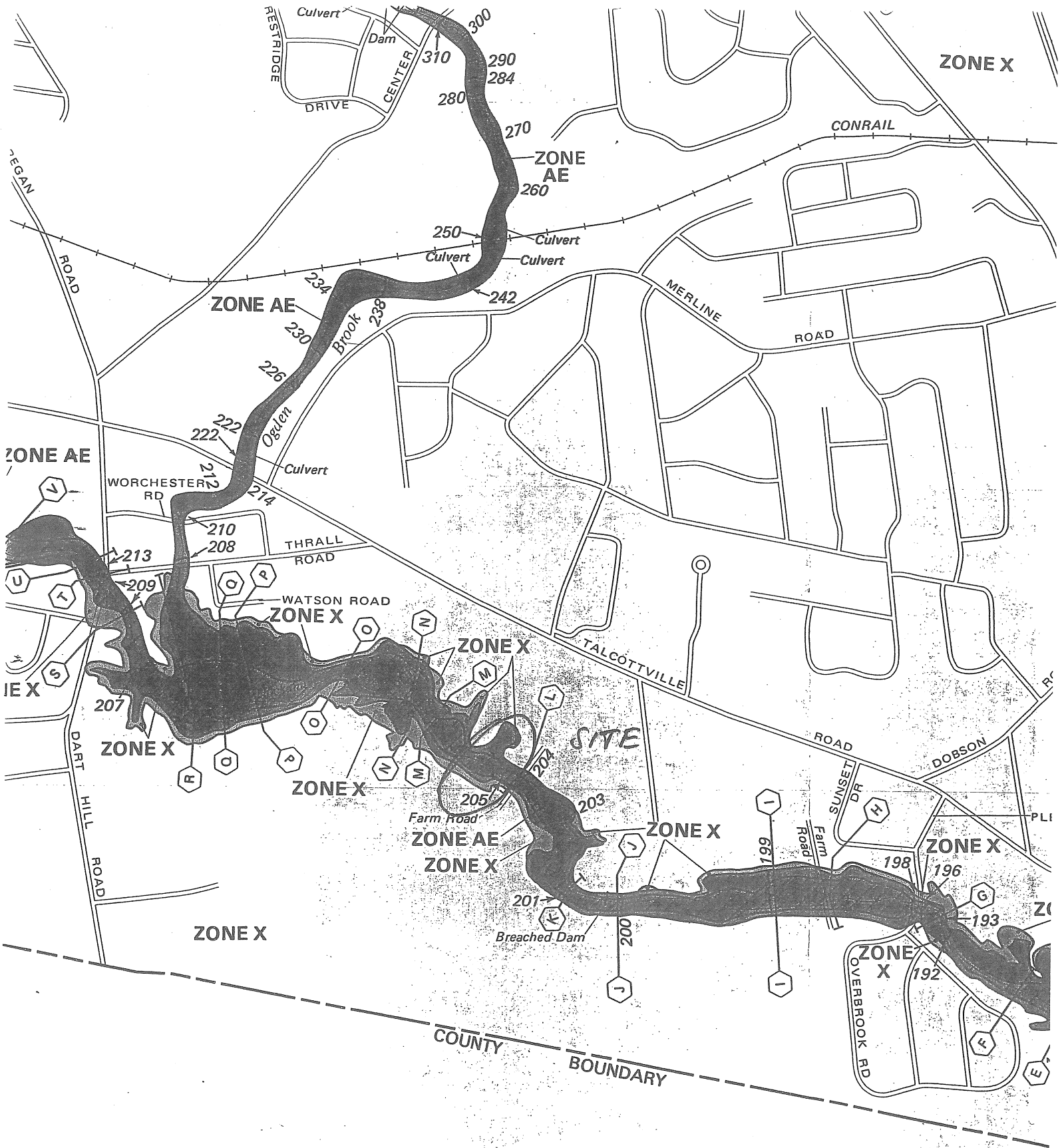


Figure 4.

Project Narrative

ITEM 4.1

**INLAND WETLANDS AND WATERCOURSE
APPLICATION FOR THE CONSTRUCTION OF
THE HOCKANUM BOULEVARD BRIDGE
OVER THE HOCKANUM RIVER
FOR THE TOWN OF VERNON**

**PROJECT NARRATIVE
JULY 1999**

The Town of Vernon is seeking an inland wetlands permit to construct a bridge over the Hockanum River by the extension of Hockanum Boulevard. The location of this river crossing is at the narrowest wetland width in this region. This bridge consists of a series of three 12'x 12' box culverts, wing walls, cutoff walls, gravel fill, roadway, curbing, drainage and sidewalk

QUANTITIES

110 LF- 12'X12' Precast concrete box culvert w/ Wing walls and Cutoff walls

233 LF 15" RCP

2 - Type "C" Catch Basins

125 CY Intermediate Rip Rap

7,500 CY fill

320 LF - 12" Water Main, 4" Gas Main, Underground Telephone and Electric

330 Tons Bituminous Concrete

640 LF Granite Curbing

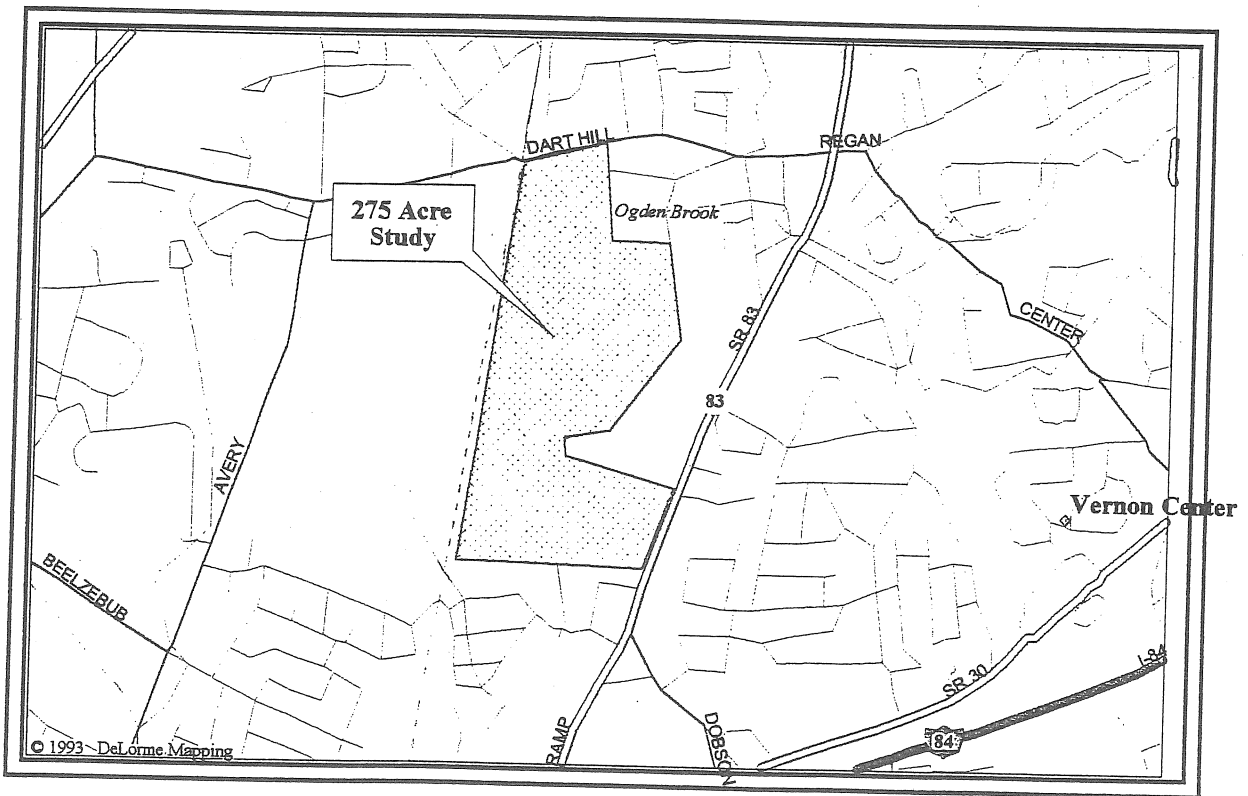
1600 SF Concrete Sidewalk

Figure 5.

Cover from Land Use Marketability & Development Study
Gerber/Chapman/Lyman Parcels
February 1999

LAND USE MARKETABILITY & DEVELOPMENT STUDY

Gerber/Chapman/Lyman Parcels
Vernon, Connecticut



FINAL REPORT

February 1999

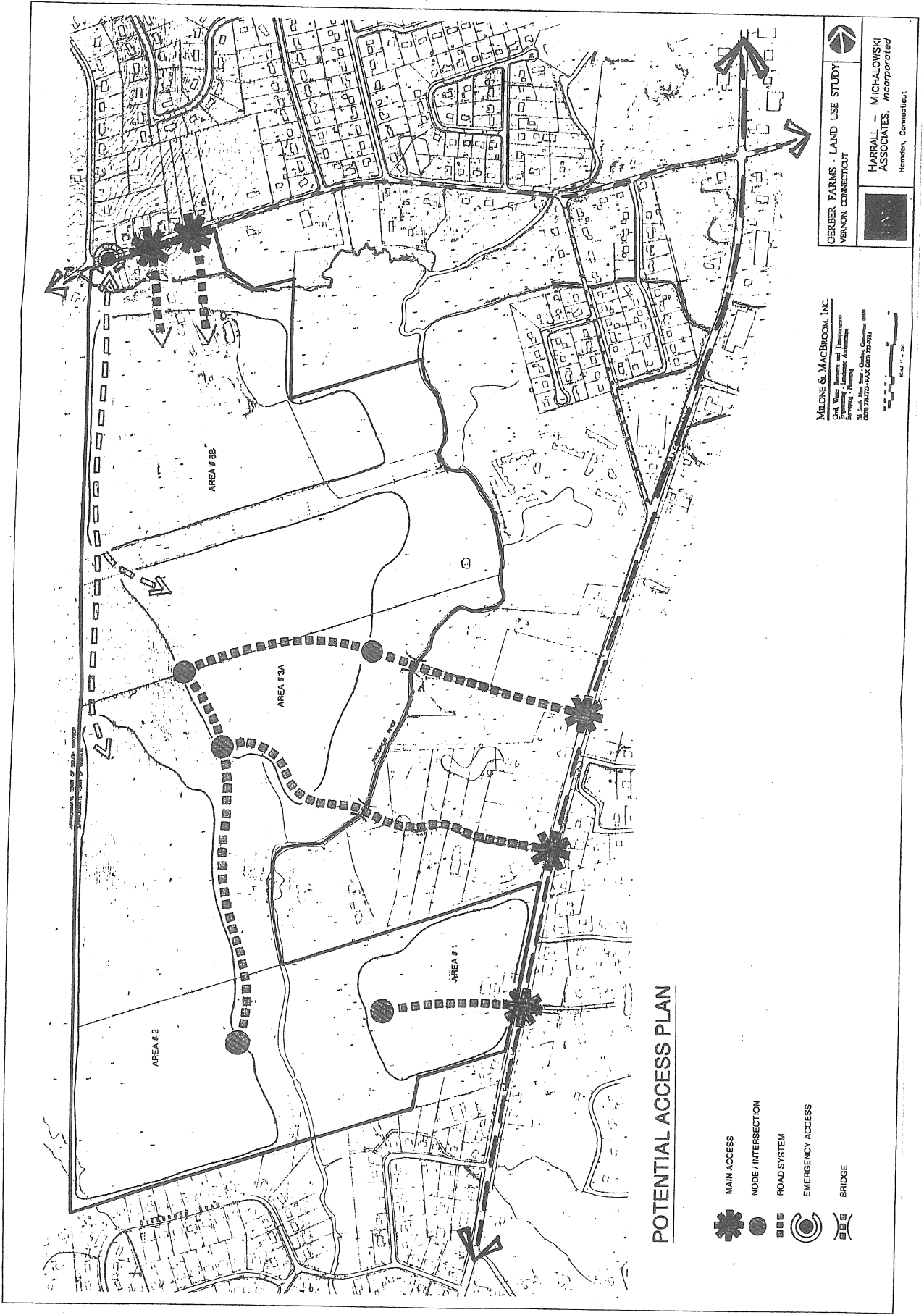


Figure 6.
 Potential Access Plan
 (From Land Use Marketability & Development Study)

THE FLOODPLAIN, FLOODING AND FEMA NFIP

The mapped floodway in this area is between 110' and 125'. (This was scaled off of a 1"=1000' 1999 NFIP (National Flood Insurance Program) map as it was between x-sections and no exact width is available.) It has been the Team engineer's experience that structures placed in the floodway, (especially new bridges) cannot be shown to meet the no-rise criteria associated with the NFIP minimum standards. If and when structures are placed in a floodway, detailed backwater hydraulic analysis are needed to prove that the new structure has "no" effect on upstream water surface elevations. In this instance FEMA (Federal Emergency Management Agency) and the CT Department of Environmental Protection (DEP) have agreed that "no rise" means 0.00'. This is difficult to prove. It will be difficult to prove that the box culverts will not affect upstream river elevations.

This may be moot, since it appears that the developer (Chapman Property) will now present a clear-span bridge. It was understood that the clear-span bridge would be from the top of the filled knob on the East to the natural high ground on the West side of the river. This was around 150' as guessed in the field. It is the Team engineer's thought that as long as the abutments for the clear-span stay out of the floodway, there shouldn't be too much of a hydraulic concern. It may prove easier or less expensive to span the floodway with a 110' - 125' span and one or two little spans on each abutment. This thought is based only on hydraulics and not on wetlands impact or other habitat/environmental impacts.

The location picked for the bridge is appropriate. A walk of the downstream reaches revealed a broader, flatter floodplain. The selected site seems to already be a pinch point in the river. Therefore, it is recommended that all crossing options be limited to a span bridge at that location as discussed on October 27th at the field review.

WETLANDS REVIEW

It would appear that the currently proposed bridge location is the best “prudent and feasible” alternative. The Hockanum Boulevard extension would cross the river on lands already owned by the Town of Vernon at a point where the riparian area is narrow and the approach elevations would allow for the construction of a single span bridge. This option, as proposed by Budd Titlow of ENSR, would be preferred in a situation such as this involving a major watercourse with a well established riparian area. The single span bridge would help to preserve existing functions and values such as wildlife utilization, nutrient retention and flood flow passage.

One of the “Factors for Consideration” included under section 22a-41 of the Inland Wetlands and Watercourses Act calls for consideration of “[I]mpacts of the proposed regulated activity on wetlands and watercourses outside the area for which the activity is proposed and future activities associated with, or reasonably related to, the proposed regulated activity which are made inevitable by the proposed regulated activity...” Consequently, the Vernon Inland Wetlands Commission has the ability to consider impacts that are not directly related to this proposed crossing, but are potential future impacts to the Hockanum River and its associated riparian which may result from the development that is made possible through the construction of this bridge. This would be an ideal time for the applicant to provide some level of conceptual design for future development of these areas which would help mitigate any potential accumulative impacts that the progressive development of these parcels may have on the ecology of the river.

SOIL AND WATER CONSERVATION DISTRICT REVIEW

The proposal is for a bridge crossing of the Hockanum River at the end of Hockanum Boulevard, a cul-de-sac from Route 83 in Vernon. The bridge will access approximately 275 acres of currently undeveloped land on the west side of the river. This is one of the largest undeveloped parcels of land remaining in Vernon and it includes significant frontage along the Hockanum River. The towns' request for the ERT is limited to the bridge crossing, so the following discussion is limited to that issue, except for some general comments regarding future development of the 275 acres. Development of the parcel is expected to generate considerable interest from the community.

The report titled *Land Use Marketability & Development Study of the Gerber/Chapman/Lyman Parcels*, prepared in February 1999 for the Town of Vernon, was referenced during preparation of this section of the report.

WETLANDS

The original proposal the Team received was for a triple box culvert crossing of the Hockanum River at the end of Hockanum Boulevard. Issues regarding wetland impacts have been simplified with the findings reported in the ENSR review of the project site, provided to Team members on October 26, 1999, the day of the field investigation. ENSR is an environmental consulting firm hired by one of the landowners (Chapman) on the west side of the Hockanum River. The report provides a detailed description of the soil, wetlands, vegetation and wildlife resources.

In the report, Budd Titlow, Senior Environmental Scientist, characterizes on-site wetlands as having a number of significant functions and values, and

recommends the use of a single span bridge instead of the triple box culvert. The span bridge will presumably sit on abutments placed entirely on upland soils and span the river and all associated wetlands. Although the Team has not reviewed specific plans for a span bridge, this type of construction may allow the crossing to be completed with minimal impacts to wetlands. Ultimately, impacts to the river and wetland will be dependent on a number of factors, including the location of bridge abutments, construction access and methods, and a number of design considerations. Without a current plan to review, it is difficult to anticipate potential impacts resulting from a span, even though the District concurs with the recommendation made by ENSR. The District would appreciate the opportunity to review plans for the bridge once they are completed.

The town has provided reviewers with a significant amount of information regarding alternative locations for the bridge. It's reasonable to conclude from the information provided that the town has chosen the best location for the crossing based on a number of considerations. In terms of wetland impacts, this location has a relatively narrow band of wetlands adjacent to the river compared to other potential sites. This is due in part to some prior filling of the wetland that occurred on the east side of the river. It should also be noted that access to the parcel on the west side of the river is possible from Dart Hill Road without the need for crossing the river. This option is not considered a practical alternative by the town based on a number of considerations, including traffic.

It is a common practice to extend the clearing associated with river crossings much wider than required for actual construction. The Hockanum River has a viable cold water (trout) fishery, so thermal impacts are a concern with excessive clearing. Clearing limits should be set to the minimum width necessary to construct a bridge.

SOILS/EROSION CONTROL

Alluvial soils are the predominant soils directly adjacent to the river. Upland soils include Manchester gravelly silt loam, Enfield silt loam, Agawam sandy loam, Ellington fine sandy loam, and Cheshire fine sandy loam. There is an area of filled land at the end of the Hockanum Boulevard. All the soils listed have low to medium erosion hazards.

Without a site plan to work from, it's impossible to evaluate any specific erosion control issues related to construction of a span bridge. Generally, bridge spans eliminate the need for in-water work and allow some distance between soil disturbance and the water. Erosion control should be simplified with construction of the span bridge. The District is available to review the erosion control plan once it is developed for the span.

There is currently a stormwater discharge on the north side of Hockanum Boulevard from a 36" culvert. The outlet of the pipe is not protected and over the years flows from the discharge have caused a significant gullies to form. The gullies extend to the river and are still actively eroding. Construction of the bridge and associated road improvements present an opportunity to correct this situation.

RECREATIONAL ISSUES

The Conservation District has been working with the Hockanum River Watershed Association on a number of projects over the past five years. As a result, we are aware of some of the open space and recreational issues concerning the Hockanum River and the Hockanum River Linear Trail. It's not appropriate for the District to suggest specific measures at this time, but we encourage the town to work with the Vernon Linear park Committee and other interested parties to make good use of this opportunity to improve access to the river. The

trail will have to cross the road or run under the span - this should be considered in the span design once a consensus is reached regarding its location.

The crossing also creates an opportunity to construct a trailhead and parking area for the linear trail. A carry-in boat launch is another possibility at this location. Other Team members suggested that a timber bridge span might be a functional and aesthetic option for the crossing. The District has a lot of information on timber bridge construction if either the town or developer is interested.

STORMWATER MANAGEMENT

The Conservation District is currently the focus of a CT DEP funded, five year non-point source watershed project. The District is working with the Hockanum River Watershed Association, private businesses, and municipalities to reduce stormwater inputs into the river. Water quality impacts to the Hockanum resulting from urban run-off has been well documented. In addition, anecdotal evidence suggests that the banks of the river are increasingly unstable due to higher peak flows associated with urban development.

Currently there are two stormwater outlets located on the property on the east side of the river. The first, discussed briefly above, consists of a 36" pipe discharging at a headwall just north of the Hockanum Boulevard. The outlet has caused significant gully formation through the parcel, for approximately 600' down to the river. Water from the discharge appears to carry a heavy sand load. The gully has apparently shifted location over time, as one area became filled with sediment and new channels formed.

Additional measures could be taken to remove the heavy sediment load from the discharge. For example, downstream of the discharge there is a depression that could be used for stormwater detention and treatment. The District is available to work with the project engineer on other potential solutions, if

desired. Some funding may also be available from the District if improvements in stormwater quality can be demonstrated.

The other outlet on the south side of the public works yard discharges into a wetland. The outlet appears stable and the discharge doesn't carry much sediment. The original plan called for additional catch basins to be tied into this discharge. If additional catch basins are added to the discharge, measures will be needed to protect the outlet. Water quality will also be a concern at this discharge with more traffic and higher rate of sanding for the new travel way.

One of the greatest potential impacts to the Hockanum from development of the 275 acre parcel is the additional stormwater discharge. The District would appreciate any opportunity we might have to review future projects proposed for the parcel, especially for stormwater quality impacts. Given the available land area adjacent to the river, inexpensive and non-structural stormwater quality treatment methods could be incorporated into the plan.

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 no known extant populations of Federal or State Endangered, Threatened or Special Concern Species that occur at the site in question.

Natural Diversity Data Base information includes all information regarding critical biologic resources available to us at the time of the request. This information is a compilation of data collected over the years by the Environmental & Geographic Information 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 substituted 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.

It is now possible for you to conduct an initial endangered species review using the "State and Federal Listed Species and Significant Natural Communities" maps available for viewing through each town's Town Hall. The Town Planner should have a copy of the map and instructions on how to use the maps. This map shows the generalized locations for listed species and communities as gray-shaded areas on a 1:24,000 scale map of the town.

FISH RESOURCES

STREAM RESOURCES

The Hockanum River is a low gradient stream with a relatively broad floodplain, which supports a mixed coldwater/warmwater fish community. The fish community within the project site is expected to be comprised of the following resident finfish: blacknose dace, longnose dace, fallfish, white sucker, and tessellated darter. In addition to being stocked with catchable size adult rainbow trout, the Hockanum River has also been stocked by the Fisheries Division with brown trout fingerlings and fry. Preliminary analysis shows encouraging growth and survival rates. Mesohabitat near the project site is mainly in the form of shallow to moderate in depth pool habitat. Instream useable cover includes large woody debris, undercut streambanks and submerged aquatic vegetation. Stream substrate is a composite of silts and coarse sands.

IMPACTS

1. Fish Passage/Habitat Concerns

The original town proposal was to install triple 12' x 12' box culverts to convey the flows of the Hockanum River. Culverts were to be installed below existing grade. The sunken culvert design will allow for upstream fish passage; however, culvert floors replace the natural stream materials with an artificial surface, especially if stream bedload does not accumulate within the boxes. Thus, this crossing design results in the alteration of instream channel and fish habitat.

When reviewing fish passage within a watercourse, it is always necessary to review this issue in a watershed context, e.g. determine the availability of free

flowing stream and the presence/absence of instream passage barrier such as dams and improperly installed culverts. For example, culverts installed "at grade" may impede fish passage by creating insufficient water depths or sheet flow conditions during low flow periods and high water velocities during storm events.

The 1st downstream crossing of the Hockanum River from the project site is located some 0.98 miles downstream within a residential housing development. The river is conveyed within four, 6 ft. diameter metal pipes with a concrete apron at the outlet. This crossing definitely impedes upstream fish passage during base and high flow regimes. The 1st upstream crossing from the project site is located 0.76 miles upstream at Dart Hill Road. The river is passable at this location being crossed with a clear span structure.

2. Culvert/Road Construction

As with any stream crossing, sedimentation is a potential environmental concern. Sediment could potentially degrade the Hockanum River if erosion and sedimentation controls are improperly installed and maintained. The placement of box culverts within the stream channel involves more water handling and construction related installation disturbance as compared to the installation of a clear span structure. If sedimentation does occur, the following damage to stream ecosystems could be expected:

- (1) Sediment reduces the survival of resident fish eggs and hinders the emergence of newly hatched fry. Adequate water flow, free of excess sediment particles is required for fish egg respiration and successful hatching.
- (2) Sediment reduces the survival of aquatic macroinvertebrates. Since aquatic insects are important food items in fish diets, reduced insect population levels in turn will adversely affect fish growth and survival. Fish require an excessive output of energy to locate preferred prey when aquatic insect levels decrease.

(3) Sediment reduces the amount of usable habitat required for spawning purposes. Excessive fines can clog and even cement gravels and other desirable substrates together.

(4) Sediment reduces stream pool depth. Pools are invaluable stream components since they provide necessary cover, shelter, and resting areas for resident fish. A reduction of usable fish habitat can effectively limit fish population levels.

(5) Turbid waters impair gill functions of fish and normal feeding activities of fish. High concentrations of sediment can cause mortality in adult fish by clogging the opercular cavity and gill filaments.

(6) Sediment encourages the growth of filamentous algae and nuisance proportions of aquatic macrophytes. Eroded soils contain plant nutrients such as phosphorous and nitrogen. Once introduced into aquatic habitats, these nutrients function as fertilizers resulting in accelerated plant growth.

(7) Sediment contributes to the depletion of dissolved oxygen. Organic matter associated with soil particles is readily decomposed by microorganisms thereby effectively reducing oxygen levels.

RECOMMENDATIONS

1. The preferred design option at the stream crossing would be the installation of a clear span bridge or arch culverts that do not have a bottom or floor. This infrastructure type would help maintain existing natural instream habitat features and ensure upstream fish passage for resident species. This design will ensure that further fragmentation of the fish population within the Hockanum River does not occur.

2. Care should be exercised so as not to increase turbidity levels in the Hockanum River when installing the stream crossing infrastructure. As a best management practice, any unconfined instream work should be restricted to the period from

June 1 to September 30, inclusive. A June 1 through September 30 timeframe can be utilized as an effective mitigation measure for construction related disturbances due to the following reasons: (1) timeframe will serve to protect the spawning, egg incubation, and fry development of resident fishes, (2) timeframe does not interfere with seasonal migratory behaviors, and (3) timeframe coincides with historic low rainfall levels in Connecticut, a period in which instream construction activities such as dewatering, excavation, trenching, and cofferdam placement are most effective.

CT DOT REVIEW

The Bureau of Policy and Planning within the CT DOT has reviewed the proposed location of the Hockanum River Bridge in Vernon and offers the following comments:

- The location of the bridge, as proposed, seems to be the best location because it would align directly with Hockanum Boulevard and would appear to have the least wetland impacts.
- At this time, no immediate development is planned for the subject site. When development plans do commence, however, the State Traffic Commission procedures and guidelines described in the enclosed brochures (see Appendix B) will apply in regard to the potential traffic impacts at the Hockanum Boulevard and Route 83 intersection.

APPENDIX A



Consulting • Engineering • Remediation

October 25, 1999

Mr. Gardner L. Chapman
115 West Road
Ellington, Connecticut 06029

155 Otis Street
Northborough, MA 01532-2414
(508) 393-8558
FAX (508) 393-8647
<http://www.ensr.com>

RE: Wetland Delineation/Site Investigation
Proposed Hockanum River Bridge
Vernon, Connecticut

Dear Mr. Chapman:

In response to your request, ENSR wetland and soil scientists investigated the referenced property and delineated the wetlands associated with the Hockanum River in the area of the proposed bridge. The wetlands on both the east and west sides of the river were delineated according to the criteria of the Connecticut Inland Wetlands and Watercourses Act (Section 22a-36 to 22a-45, as amended, of the Connecticut General Statutes) and the Inland Wetlands and Watercourses Regulations for the Town of Vernon ("the Regulations"). The wetland resource areas were also delineated according to the federal criteria under Section 404 of the Clean Water Act in accordance with the Corps of Engineers Wetland Delineation Manual (1987), and relevant Corps of Engineers-New England Division (NED) wetland delineation policies.

During our field delineation, we documented the primary characteristics and functions of the wetland resources in this area. Our findings are summarized in the following paragraphs:

Wetland A

Wetland A is a riparian wetland located on the eastern side of the Hockanum River and is delineated in the field with wetland flags A-1 through A-52. The outer (up-gradient) areas of the wetland are primarily forested. Moving closer to the river, the vegetation changes to a scrub/shrub wetland interspersed with areas of emergent marsh. The interspersed of these different wetland plant communities coupled with the presence of upland forests and fields as well as the Hockanum River itself combine to produce a diverse and productive system.

Typical trees within Wetland A consist of red maple (*Acer rubrum*), eastern cottonwood (*Populus deltoides*), willows (*Salix spp.*), and sycamore (*Platanus occidentalis*). The trees are subtended by such shrub species as silky dogwood (*Cornus amomum*), arrowwood (*Viburnum recognitum*), winterberry (*Ilex verticillata*), and elderberry (*Sambucus canadensis*). Typical herbaceous plants include reed canary grass (*Phalaris arundinacea*), stinging nettle (*Urtica dioica*), false nettle (*Boehmeria cylindrica*), willow herb (*Epilobium sp.*), and arrow-leaved tearthumb (*Polygonum sagittatum*). More data pertaining to the vegetation in Wetland A is provided in **Table 1**.

The primary functions and values associated with Wetland A are groundwater recharge/discharge, floodflow alteration, fish and shellfish habitat, sediment and toxicant retention, nutrient removal, production export, sediment/shoreline stabilization, wildlife habitat, recreation, and aesthetics.



Wetland B

Wetland B is located on the western side of the Hockanum River and is delineated in the field with wetland flags B-1 through B-8 and 1B-1 through 1B-12. The transition zone associated with Wetland B is relatively thin, as there is a steep bank from the edge of the wetland up to the edge of the agricultural field, which it borders. Wetland B is also a riparian wetland exhibiting plant communities typical of scrub/shrub and emergent wetlands. Vegetation within Wetland B is very similar to that found in Wetland A (see Table 1).

Wetland functions and values associated with Wetland B include groundwater recharge/discharge, floodflow alteration, fish and shellfish habitat, sediment and toxicant retention, nutrient removal, production export, sediment/shoreline stabilization, wildlife habitat, recreation, and aesthetics.

Table 1. Dominant wetland vegetation identified in study area

Common Name	Scientific Name
Herbaceous	
Smartweeds	<i>Bidens spp.</i>
False Nettle	<i>Bohmeria cylindrica</i>
Tussock Sedge	<i>Carex stricta</i>
Willow Herb	<i>Epilobium sp.</i>
Boneset	<i>Eupatorium perfoliatum</i>
Jewelweed	<i>Impatiens capensis</i>
Soft Rush	<i>Juncus effusus</i>
Sensitive Fern	<i>Onoclea sensibilis</i>
Cinnamon Fern	<i>Osmunda cinnamomea</i>
Reed Canary Grass	<i>Phalaris arundinacea</i>
Clearweed	<i>Pilea pumila</i>
Arrowleaf Tearthumb	<i>Polygonum sagittatum</i>
Rough Stemmed Goldenrod	<i>Solidago rugosa</i>
Skunk Cabbage	<i>Symplocarpus foetidus</i>
Shrubs	
Speckled Alder	<i>Alnus rugosa</i>
Silky Dogwood	<i>Cornus amomum</i>
Spicebush	<i>Lindera benzoin</i>
Tartarian Honeysuckle	<i>Lonicera tatarica</i>
Multiflora Rose	<i>Rosa multiflora</i>
Common Elderberry	<i>Sambucus canadensis</i>
Highbush Blueberry	<i>Vaccinium corymbosum</i>
Northern Arrowwood	<i>Viburnum recognitum</i>
Trees	
Red Maple	<i>Acer rubrum</i>
Eastern Cottonwood	<i>Populus deltoides</i>



Sycamore	<i>Platanus occidentalis</i>
Willow	<i>Salix spp.</i>
Vines	
Common Dodder	<i>Cuscuta gronovii</i>
Virginia Creeper	<i>Parthenocissus quinquefolia</i>
False Climbing Buckwheat	<i>Polygonum scandens</i>
Deadly Nightshade	<i>Solanum dulcamara</i>
Poison Ivy	<i>Toxicodendron radicans</i>
Grape	<i>Vitis spp.</i>

Soils

ENSR's medium intensity soil investigation generally agreed with the majority of the soil series mapped on-site (see 1966 Tolland County Soil Survey).

Eastern Side

The primary difference occurred on the eastern side of the river where ENSR scientists found Udorthent soils, which were not previously mapped. The Udorthent soil series are disturbed soils where filling, excavating, or grading has altered more than two feet of original soil surface. These soils are generally well drained to somewhat excessively well-drained soils and were observed throughout the entire eastern side, extending to the wetland boundary. Debris (including metal, asphalt, concrete, and household waste) was observed in the imported fill material on the eastern side of the river. As delineated, the regulated alluvial/floodplain soils on this side consisted of poorly drained and very poorly drained mineral and organic (Histosols) soils.

Western Side

The upland soils along the western portion of the site did not require close examination due to a naturally occurring steep bank that produced an abrupt (and obvious) upland/wetland boundary. The regulated alluvial/floodplain soils on the west side are very similar to the soils observed along the eastern side of the study site.

Table 2 shows the soil mapping units present on the site according to the Tolland County Soil Survey (1966).

Table 2. Soil Mapping Units

Soil Name	Mapping Unit
Alluvial Land	Am
Manchester gravelly sandy loam	MgC
Enfield silt loam	EtB
Agawam sandy loam	AbA, AbB
Ellington fine sandy loam	EfA
Cheshire fine sandy loam	CsB

Wildlife Habitat

As mentioned earlier, the interspersed of the different wetland and upland plant communities, in close proximity to the Hockanum River, creates a diverse and productive habitat for wildlife.

The dense scrub/shrub and emergent wetland areas, as well as both the upland and wetland forests, provide ample cover and abundant food resources for a wide range of animals and nesting sites for many species of birds. Whitetail deer have heavily browsed the vegetation within the wetland and there are numerous bird nests in the shrubs. Many standing dead trees also add to the value of the wildlife habitat by providing nesting sites for cavity nesting birds (e.g., wood duck, black-capped chickadee, white-breasted nuthatch) as well as food resources and perches for other bird species.

Table 3 provides a list of wildlife species identified as occurring on the site during ENSR's September 29, 1999 site visit.

Table 3. Wildlife species occurring in the study area

Common Name	Scientific Name
Amphibians	
American Toad	<i>Bufo americana</i>
Gray Tree Frog	<i>Hyla versicolor</i>
Spring Peeper	<i>Psuedacris crucifer</i>
Green Frog	<i>Rana clamitans</i>
Birds	
Wood Duck	<i>Aix sponsa</i>
Northern Cardinal	<i>Cardinalis cardinalis</i>
Yellow-Shafted Flicker	<i>Colaptes auratus</i>
American Crow	<i>Corvus brachyrhynchos</i>
Blue Jay	<i>Cyanocitta cristata</i>
Belted Kingfisher	<i>Megaceryle alcyon</i>
Song Sparrow	<i>Melospiza melodia</i>
Northern Mocking Bird	<i>Mimus polyglottos</i>
Black-Capped Chickadee	<i>Parus atricapillus</i>
American Woodcock	<i>Philohela minor</i>
Mammals	
Eastern Coyote	<i>Canis latrans</i>
Woodchuck	<i>Marmota monax</i>
Whitetail Deer	<i>Odocoileus virginianus</i>
Muskrat	<i>Ondatra zibethica</i>
Raccoon	<i>Procyon lotor</i>
Eastern Chipmunk	<i>Tamias striatus</i>

October 25, 1999
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Impact Assessment of Triple Box Culvert Bridge Crossing Alternative

The ENSR staff believes the presently proposed triple box culvert crossing of the Hockanum River could have significant impacts on the river (flow, banks, and floodplain) and the associated wetlands. Based on our field review, we believe the proposed triple box culvert crossing could have the following significant impacts:

- Disrupting (fragmenting) wildlife travel corridors in floodplain riparian habitat
- Altering aquatic habitat within the channel of the Hockanum River
- Altering flood flows by backing up water behind the proposed box culverts
- Causing downstream erosion by constricting flow during storm events, resulting in increased downstream water velocities
- Reducing flood water storage capacity by placing fill in the floodplain.

Summary and Recommendations

Based on our work to date, the ENSR staff provides the following summary of findings and recommendations:

1. The regulated wetlands have been field delineated and exhibit the following significant functions and values: groundwater recharge/discharge, floodflow alteration, fish and shellfish habitat, sediment and toxicant retention, nutrient removal, production export, sediment/shoreline stabilization, wildlife habitat, recreation, and aesthetics.
2. The proposed crossing location meets the *Most Feasible and Prudent Development Alternative (MFPDA)* test.
3. The proposed crossing method (triple box culvert) does not meet the *MFPDA* test.
4. The triple box culvert design should be replaced with a single span design. A single span design will meet the *MFPDA* test and avoid all of the impacts previously described for the triple box culvert design. Coupled with ENSR's finding that this study site is the best location for a crossing, a single span bridge is by far the least environmentally intrusive design for this river crossing.
5. Because they would involve some disturbance of the river channel, intermediate crossing designs (i.e., between a triple box and a single span; for example, a twin arch) would have significantly greater impacts on wetlands and wildlife habitat than the single span design and are not recommended.

We appreciate the opportunity to work with you on this project. If you have any questions, please contact me at (508) 393-6779.

Sincerely,
ENSR



Budd Titlow, Senior Environmental Scientist

APPENDIX B

statutes, the developer is responsible for 100% of the costs associated with the certificate requirements.

The exception to this is if the developer is a town or municipal agency.

Q. For how long is a certificate valid?

A. Certificates are issued for a ^{two}one-year period. Renewals may be requested in writing and are reviewed by the Division of Traffic Engineering prior to being acted on at one of the STC's monthly meetings.

Q. Is a developer allowed to do any preliminary site work prior to obtaining a certificate?

A. Yes. Preliminary clearing of a site, including earth work, is acceptable. No foundation work may occur prior to issuance of a certificate. The statutes prohibit the issuance of a building or foundation permit by the town until a certificate is issued.

Q. What if I own separate parcels of land in the same area which individually do not require a certificate?

A. Section 14-311(c) of the statutes requires that such parcels which may be separated by a state or local roadway, but which are utilized together for a single development purpose, will require certification.

Industrial or office parks, where the parcels may be individually sold off, likewise would come under the purview of Section 14-311(c) of the statutes.

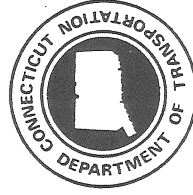
Q. Is a DOT permit the same as an STC Certificate of Operation?

A. No. A DOT encroachment permit is needed for all work within DOT right-of-way, including that required by a Certificate of Operation. These permits are issued by the Department's four

District Offices located in Rocky Hill (tel. (860) 258-4544, Norwich (tel. (860) 823-3230), New Haven (tel. (203) 389-3008, and Thomaston (tel. (860) 585-2793. This process would occur after issuance of a certificate and requires more detailed plans, although developers may procure a DOT permit to do some work within State right-of-way prior to obtaining a Certificate.

Copies of the DOT encroachment permit regulations may be obtained by contacting the Office of Maintenance at (860) 594-2608.

Revised August 15, 1996



CONNECTICUT DEPARTMENT OF TRANSPORTATION



STATE TRAFFIC COMMISSION CERTIFICATES OF SAFE TRAFFIC OPERATION

Developers are frequently overwhelmed by the different permitting requirements of state and local jurisdictions. The purpose of this pamphlet is to inform and clarify when permission must be sought from the State Traffic Commission (STC) for constructing or expanding developments which will generate large volumes of traffic.

The empowering statute is Section 14-311, which is entitled, "Open air theaters, shopping centers and certain other developments affecting state highway traffic."

Subsection (a) of Section 14-311 states, "No person, firm, corporation, state agency, or municipal agency or combination thereof shall build, expand, establish or operate any open air theater, shopping center or other development generating large volumes of traffic, having an exit or entrance on, or abutting or adjoining, any state highway or substantially affecting state highway traffic within this state until such person or agency has procured from the state traffic commission a certificate that the operation thereof will not imperil the safety of the public."

Listed below are a series of questions and answers which are most often fielded by the office of the State Traffic Commission regarding developments in Connecticut.

Q. What is the State Traffic Commission ?

A. Section 14-298 of the statutes establishes within the Department of Transportation (DOT) a State Traffic Commission. The STC consists of the commissioners of the Connecticut Departments of Transportation, Public Safety, and Motor Vehicles. The STC promulgates regulations establishing a uniform system of traffic control signals, devices, signs and markings for public highways. The STC also adopts regulations in cooperation and agreement with local traffic authorities governing the use of state highways and roads.

Q. Where is the STC located ?

A. The office of the State Traffic Commission, which is staffed by the Executive Director of the STC and clerical and engineering personnel, is located within the Department of Transportation. It is located at 2800 Berlin Turnpike, Newington, CT 06131-7546, Tel No. (860) 594-3020, FAX No. (860) 594-2377.

Q. Section 14-311 does not mention what size developments require certification by the STC. How do I know if my development qualifies?

A. The STC has adopted regulations which define a development needing a certificate of operation as any which provides 200 or more parking spaces or has a gross floor area of 100,000 square feet or more.

Q. Suppose I am expanding a development which existed prior to enactment of the statute. Do I need a certificate?

A. It depends. If the warranting threshold and location criteria are met, as soon as either 200 parking spaces or 100,000 square feet are provided by expansion, either a certificate or a certificate determination (see next question) will be necessary.

Q. Suppose I do not have a driveway on a state highway. Do I still need a certificate from the STC?

A. The statute requires that a development of the regulated size which has a driveway on a state highway or which abuts or adjoins a state highway or which substantially affects state highway traffic obtain a certificate of operation.

For those developments which do not have a driveway on, or abut or adjoin a state highway, a determination of impact (certificate determination) must be made. In these cases, the developer is asked to submit enough information so that an evaluation of the impact on the nearest state highway intersection(s) may be made.

Q. If I already have a certificate and I am expanding, what should I do?

A. A new certificate is needed for any development which already has been certified and is increasing its parking facilities by 50 or more parking spaces. Any increase in square footage requires a new certificate.

Also, any significant change in use from that previously approved (i.e., office-to-retail) will require a new certificate.

Q. If a development needs a certificate, how much information should be submitted?

A. The STC has an application package which consists of an application form and a check list of needed information. For large developments proposed on vacant land, normally all the information contained on the check list is required. For other developments, a preliminary scoping meeting may be held or information may be exchanged via telephone to determine the extent of data needed for review.

Representatives of the DOT are available for preliminary reviews of proposed developments to discuss intermodal transportation issues prior to formal submittal to the STC.

Q. Is there an application fee ?

A. No.

Q. How long does it take to obtain a certificate?

A. Section 14-311 of the statutes allows 120 days of review time. The time periods during which additional information is required of the developer are not counted as part of the 120 days.

The actual review time may be less than the 120 days. In many instances, certificates for smaller developments are issued within a month or two of submittal. The actual time is dependent upon many variables, including the completeness of a submittal and the complexities of the area and surrounding roadway network.

The STC normally meets the third Tuesday of each month. Reports are prepared by the Department of Transportation's Division of Traffic Engineering containing recommendations required to be met in order for the certificate to remain in effect, which are acted on at the STC's monthly meetings.

Q. Does the town in which the development lies have any say in the issuance of a certificate?

A. The legal traffic authority (LTA) of each town is contacted during the course of the technical review conducted by the Division of Traffic Engineering. The LTA's concurrence or nonconcurrence is noted at the STC meeting. The scope of improvements is discussed at the meeting, and any town representatives or residents are welcome to attend these meetings to express their viewpoints.

Q. Who pays for the cost of improvements?

A. In accordance with Section 14-311 of the

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, 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.