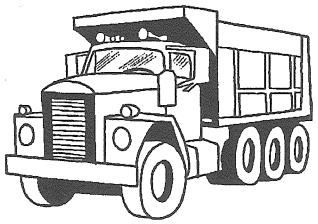
Venuti Enterprises, Inc.
Excavation
Route 82
Montville, Connecticut



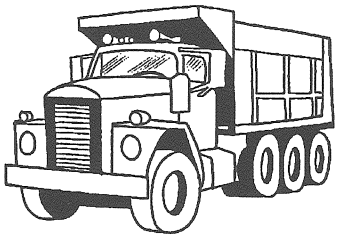
Eastern Connecticut Environmental Review Team Report

Eastern Connecticut Resource Conservation and Development Area, Inc.

Venuti Enterprises, Inc. Excavation

Route 82

Montville, 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 and
Inland Wetlands Commissions
Montville, Connecticut

January 1998

CT Environmental Review Teams
1066 Saybrook Road, P.O. Box 70
Haddam, CT 06442
(860) 345-3977

ACKNOWLEDGMENTS

This report is an outgrowth of a request from the Montville Planning and Zoning Commission and the Inland Wetlands Commission to the New London 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 Thursday, November 6, 1997.

Norman Gray	Geologist UCONN - Dept. of Geology and Geophysics 860-486-4434
Doug Hoskins	Wetland Specialist/Environmental Analyst III DEP - Inland Water Resources Division (860) 424-3903
Ann Kilpatrick	Wildlife Biologist DEP - Eastern District Headquarters 860-295-9523
Seth Lerman	Environmental Technician New London County SWCD 860-887-3604
Dawn McKay	Biologist/Environmental Analyst III DEP - Natural Resources Center (860) 424-3592

Brian Murphy	Fisheries Biologist DEP - Eastern District Headquarters 860-295-9523
Tom Seidel	Regional Planner Southeastern CT Council of Governments 860-889-2324

I would also like to thank Marcia Vlaun, town planner, Tom Sanders, assistant planner, Colleen Sawicki, planner II, Wanda and Robert Donahue, landowners, Donald Venuti, applicant, Harry Heller, attorney for the applicant, Chris Clark, project engineer/surveyor, Rich Snarski, project soil scientist, and Bruce Morton and Stephen Pietrzyk, project hydrologists, 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 detailed plans and reports. Other additional information was mailed to Team members after the field review as it became available. 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 applicant/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 and applicant/landowner. 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 earth products excavation.

If you require additional information please contact:

Elaine Sych, ERT Coordinator
CT ERT Program
P.O. Box 70
Haddam, CT 06438
(860) 345-3977

TABLE OF CONTENTS

List of Figures

INTRODUCTION

I. Introduction

The Montville Planning and Zoning Commission and Inland Wetlands Commission have requested assistance from the Eastern Connecticut Environmental Review Team in conducting an environmental review of a proposed earth products excavation.

The ±100 acre parcel is located on Route 82 and Old Colchester Road Extension. Access to the site will be from Route 82. Approximately 22 acres will be excavated in four phases for a projected removal of 473, 407 cubic yards of material. The site contains extensive wetlands and Whittle Brook, but the excavation is planned to avoid any direct impacts to wetlands and maintains a minimum 400 foot separation from Whittle Brook. The western portion of the site is not proposed for any excavation. The planned use for the property once the excavation is complete is for a containerized nursery.

II. Objectives of the ERT Study

The Town has asked for assistance with the review of this project with regard to the environmental impacts on and off the site resulting from the excavation. Specific concerns voiced by the Town include potential wetland impacts and their minimization; geologic and hydrologic resources, concerns and limitations; erosion and sediment control, soils and review of closure plan; aquatic resource impacts; wildlife habitat impacts; and planning, traffic and access review.

III. The ERT Process

Through the efforts of the Planning and Zoning and Inland Wetlands Commissions this environmental review and report was prepared for the Town of Montville.

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 on November 6, 1997, and various Team members also made separate and/or additional field 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.

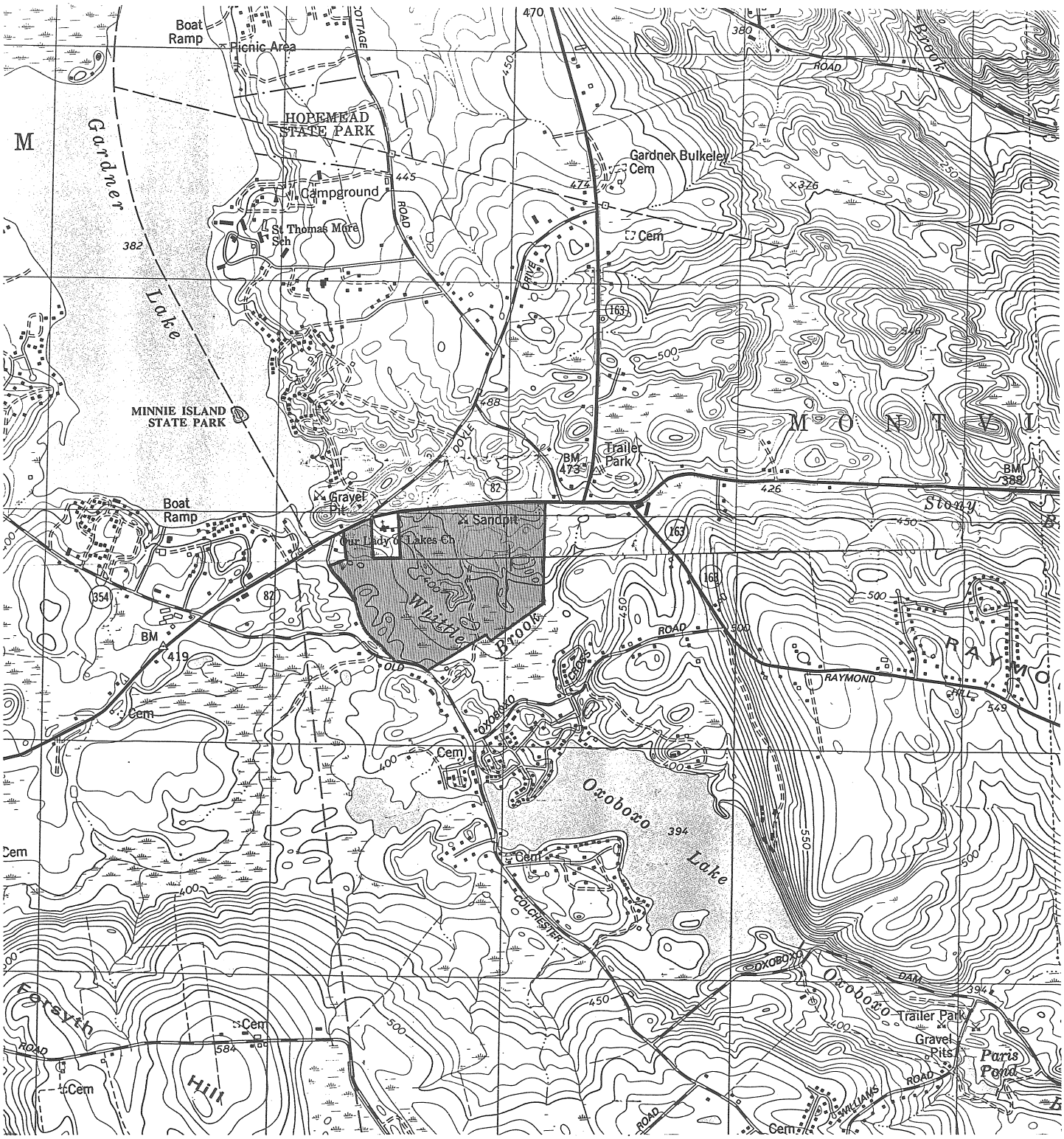
Once Team members had assimilated an adequate data base, they were able to analyze and interpret their findings. Individual Team members then prepared and submitted their reports to the ERT coordinator for compilation into this final ERT report.

Figure 1

Topographic and Location Map

⇑

Scale 1″ = 2000′



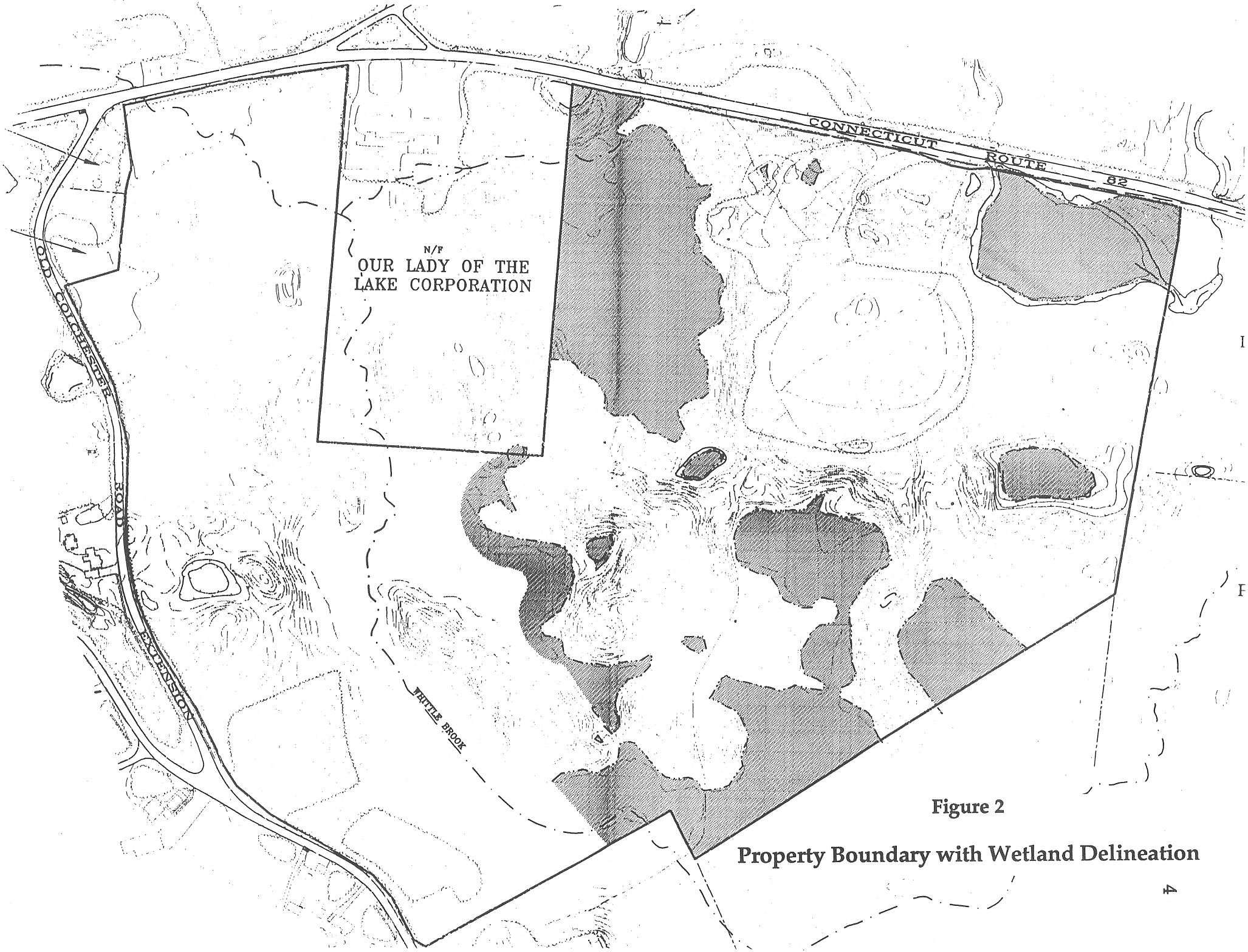


Figure 2

Property Boundary with Wetland Delineation

SOIL RESOURCES

The soils on this site range from excessively drained, gravelly sandy loam to very poorly drained organic soils. The majority of the site is comprised of glacial outwash, glacial till, and water sorted sand and gravel soils, with the glacial outwash soils predominating. Also present on the site are organic soils. A perennial stream, Whittle Brook, bisects the property in a northwesterly to southeasterly direction, with roughly two-thirds of the property located on the eastern side of the brook and one-third of the property located on the western side of the brook. The organic soils and water sorted sand and gravel soils are situated primarily along the stream, while the glacial outwash and glacial till soils are found on the remainder of the property. Excavation of materials is to occur only on the portion of the property to eastern side of the stream.

The general soil types of the glacial outwash soils are identified by the Hinckley Merrimac - Agawam soil map units. Described in the *Soil Survey of New London County, Connecticut* as nearly level to steep, excessively drained to well drained, sandy and loamy soils, these general soil types are found on outwash plains, stream terraces, kames, and eskers in valleys between glacial uplands. All Hinckley soil map units found on the site (HkA, HkC, HkD) are classified as excessively drained, gravelly sandy loams with slopes ranging from nearly level (HkA) to gently sloping (HkC), to moderately steep to steep (HkD). The Merrimac soil (MyB) on the parcel is gently sloping, and somewhat excessively drained, while the Agawam soil map unit (AfB) is identified as a nearly level, well drained, fine sandy loam.

The Canton and Charlton (CdD) soil map unit found on the site represents a moderately steep to steep, well drained, extremely stony fine sandy loam. The moderately well drained Sudbury (Sg) soil map unit is identified as a nearly level to gently sloping sandy loam. Also located on the property is the Udorthents (Ud) (urban land complex) soil map unit. Classified as excessively drained to moderately well

drained soils that have been disturbed by cutting or filling and areas covered by building and pavement, these soils range from nearly level to moderately steep.

According to the *Soil Survey of New London County, Connecticut,* the soils on the site identified as State of Connecticut regulated wetland soils include Carlisle Muck (Ce), Scarboro mucky fine sandy loam (Sf), Walpole fine sandy loam(Wd), and Adrian and Palms muck (Aa). The wetland soils are scattered throughout the site.

Undisturbed soils on the site are predominantly in woodland. However, it should be noted that a portion of the property is currently being used for agriculture. The field was most recently planted in corn.

The dominant soil features of this site are depth to bedrock (typically greater than 60 inches) and the excessively drained to well drained nature of the non-wetland soils. The dominant water feature for the upland soils is a depth to the high water table greater than six (6) feet. Furthermore, permeability of the soils on the property ranges between 2.00 to 20.00 inches per hour. Additional information about the site's soil properties can be found in the appendix of this report.

Figure 3
Soils Map

⇑

Scale 1″ = 1320′

GEOLOGIC RESOURCES

I. Topography and Surficial Geology

Venuti Enterprises proposes to excavate approximately 470,000 cubic yards of sand and gravel from 22 acres of a 100 acre parcel lying between Whittle Brook and Route 82 in the town of Montville, CT. The site is part of an extensive 1700-acre deposit of stratified drift (see Figure 4) which has supported several small sand and gravel operations in the past. The deposit formed in ponds, crevasses and meltwater channels between blocks of remnant stagnant ice during the retreat of the last continental ice sheet 14,000 years ago. Sands and gravels accumulated in a confused and rapidly changing drainage system. Meltwater from the Whittle Book area drained, at various times, to the west along Fraser Brook, to the east down Stony Brook, to the northwest along Gardner brook and to the Southeast along the Oxoboxo Brook valley (Goldsmith, 1962). At times, the area was covered by lakes ponded behind sediment and ice dams and on other occasions, the site had rapidly flowing meltwater streams. The irregular hummocky topography of the deposit is a consequence the presence of stagnant ice during the deposition of sands and gravels. The ridges and hills in the "Phase IV" area were deposited by meltwater streams channeled along deep crevasses and ice-walled canyons. The flat-topped terrace in the northeast corner of the property is part of a large delta that grew into the ice-dammed ponds. The closed depressions, the "kettles" along the eastern edge of the property were formerly large ice blocks buried in the rapidly accumulating sands and gravels. When the ice melted, the stream channel and delta deposits, previously the topographic low points were left high and dry as ridges and flat topped hills. Isolated depressions appeared where the buried ice blocks once hid.

After the ice permanently disappeared, but before a vegetative cover became well established, wind blown silts and fine sand accumulated in the kettle holes and other protected hollows on the lee sides of the ridges. The fine-grained eolian silt blanket is considerably less permeable than the underlying sands and although only a few feet

thick plays a significant role in the hydrology of the vernal pools in the small topographic depressions on the property.

The total thickness of stratified drift on the site is unknown but is probably on the order of 50-100 feet. Since the proposed excavations are no deeper than the current water table (at approximately the 400-foot elevation) there is more than sufficient sand and gravel present. The quality of the material available is somewhat less certain. The coarsest sand and gravel is found in the ridges and hills of the Phase IV area and along the Old Colchester Road Extension on the western edge of the property (an area not part of the present plans). The terraced area slated for excavation during Phases I through III seems to be capped by medium grained sands which at depth become progressively finer grained and thus less commercially valuable. Test pits at the base of the terraces expose laminated gray silts originally deposited on the bottom of ice dammed ponds into which sand and gravel deltas grew.

For the most part material to be excavated is quite permeable and throughout most of the year lies well above the water table. As the current plans avoid significant changes to the pattern of surface drainage, the excavation of the highly permeable sand and gravel size material should have little to no effect on the general hydrology of the nearby wetlands. On the other hand, removal of the fine gray silts that may be present in the areas of Phases I through III operations could have some impact on the adjacent wetlands. The gray, unoxidized color of the silt suggests that they permanently lie below the present water table. Because of their low permeability, water is stored in the silt. Under drought conditions, this water is slowly released and contributes to the stability of the local wetland system. Since the gray silt has no commercial value and since it is not likely to be underlain by coarser grained sands, there would be little motivation to continue excavation if significant areas of it are encountered. In other words, some flexibility should be afforded to the developer to alter the proposed grading plans if the underlying gray silt is more extensive than expected.

A similar argument suggests that the chemical composition of the waters recharged to the wetlands would not be significantly affected by the excavation of sand and gravel lying above the level of the present water table. However, if water saturated gray silt were removed and used to regrade part of the site, the oxidation of the small amounts of the sulfides it may contain could acidify the groundwater entering the adjacent wetlands. As far as the groundwater water quality is concerned, it certainly would be preferable not to disturb any area of thick gray silt exposed during excavation.

II. Bedrock Geology

Bedrock does not outcrop anywhere on the Venuti property and it is unlikely to be encountered in any of the planned excavations. Based on the distribution of exposed rocks in the highlands surrounding the Gardner and Oxoboxo Lakes the published geologic maps (Goldsmith, 1967; Rodgers, 1985; Synder, 1964) infer the area to be underlain by 1000 million year old metamorphosed sedimentary rocks belonging to the "Waterford Group" (terminology from Rodgers 1985 which supercedes the names applied to the rock groups on the geological quadrangle maps). The rocks are generally medium grained plagioclase layered gneisses containing variable amounts of plagioclase feldspar, quartz, potassium feldspar, biotite, and hornblende. A major, but inactive, east-west fault zone, the so-called Honey Hill Fault, is situated less than a mile to the north. This fault separates two distinct geologic terranes; on the south an ancient continental crustal fragment known as Avalon and on the north a complex melange of highly deformed ocean floor sediments and island arcs of the 400 million year old Iapetos Ocean. The Iapetos rocks were caught up in the collision of North America and the Avalon continents. North American terrane is found only in the western part of Connecticut. The reopening of the Atlantic Ocean a mere 200 millions years ago left slivers of Iapetos and Avalon terranes attached to the present North American continent.

III. References

Surficial Geology

Goldsmith, Richard, 1962. Surficial Geology of the Montville Quadrangle, Connecticut, USGS Geological Quadrangle Map GQ- 148.
Pessel, Fred, 1966. Surficial Geology of the Fitchville Quadrangle, Connecticut, USGS Geological Quadrangle Map GQ-485.

Bedrock Geology

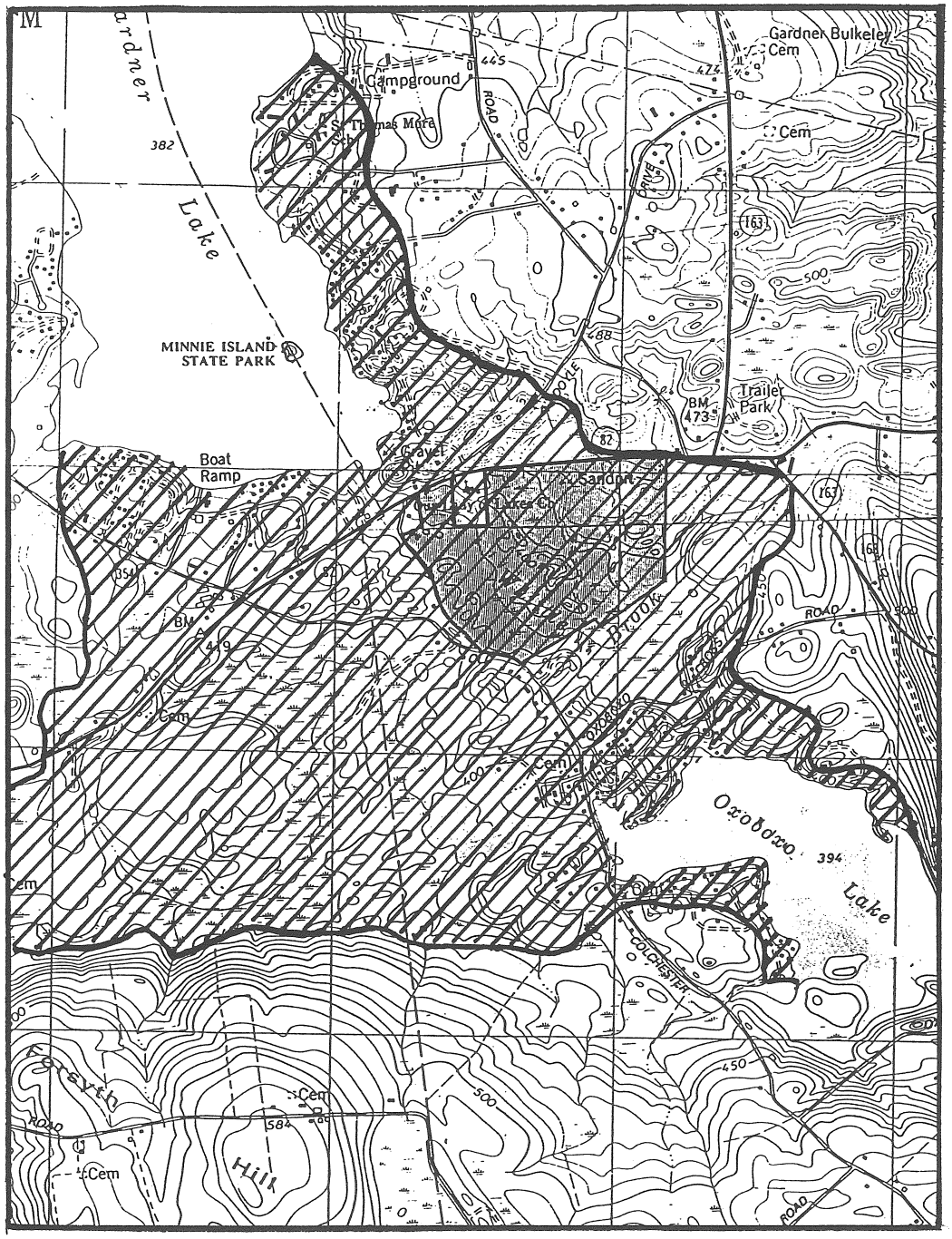
Goldsmith, Richard, 1967. Bedrock Geology of the Montville Quadrangle, Connecticut, USGS Geological Quadrangle Map GQ-609.
Snyder, G. L., 1964. Petrochemistry and Bedrock Geology of the Fitchville Quadrangle. USGS Bulletin 1161 - 1.
Rodgers, John, 1985. Bedrock Geologic Map of Connecticut, 1: 125,000. Connecticut Natural Resources Atlas Series, Connecticut Geological and Natural History Survey.

Figure 4

Area Underlain by Stratified Drift

(glacial meltwater deposited silt, sand and gravel)

Gardner Lake – Oxoboxo Lake Valley



EROSION AND SEDIMENT CONTROL MEASURES

The inclusion of erosion and sediment control measures such as the construction entrance pad, the installation of sediment barriers around the perimeter of operation activities as well as around stockpile areas, the plans to temporarily seed stockpile areas, the installation of numerous sediment basins, the revegetation of each phase upon its completion, the development and submittal of more detailed plans for each individual phase, and the provision for all erosion and sediment control measures to be checked by the Town of Montville prior to the commencement of any on site activity demonstrates an effort to minimize erosion and sedimentation resulting from the gravel excavations and a willingness of Venuti Enterprises to work with the Town of Montville to ensure that measures are installed and maintained appropriately.

Despite the overall satisfactory quality of the erosion and sediment control plan, some comments regarding the plan should be considered.

(1.) The "General Procedures, Phases I-IV" portions of the *Application of Venuti Enterprises, Inc. to Montville Inland Wetlands and Watercourses Commission* states that stockpile side slopes will not exceed 3:1. It should be verified that this is three (3) feet horizontal to one (I) foot vertical in order for it to be in accordance with the current edition of Connecticut's *Guidelines for Erosion and Sediment Control,* which indicates the slope of a topsoil stockpile area must not exceed 2:1 (two foot horizontal, one foot vertical).

(2.) Given the phased approach of the project the Town will want to confirm that the proposed sedimentation basins are correctly sized and constructed in order to accommodate the storage volume necessary for the particular drainage area on the site. It should be remembered that the drainage area for sediment basins #'s 6, 7, and 8 (sheet

5 of 9 on Site Plan) will increase when phases II and III (as illustrated on *The Phase I Earth Excavation & Closure Plan, Venuti Enterprises Inc.)* are implemented.

(3.) Although the 2:1 final side slopes illustrated in the Final Closure Plan are within the limits for finished side slopes as outlined in the *Guidelines for Erosion and Sediment Control,* these steep slopes can be difficult to establish and maintain. Furthermore, the droughty nature of the Hinckley and Merrimac soils adds to the potential difficulty in reestablishing a vegetative cover on the exposed slopes, even with the four (4) inch layer of topsoil proposed to be spread over the excavated slope. It is suggested that mats or netting be used in conjunction with mulch in order to effectively secure the banks and promote plant growth.

(4.) Although the soils to be excavated a have high permeability, the potential for erosion on the HkD soil map unit is severe, and is moderate to severe on the HkC soil map unit. It is recommended that a temporary mulch be applied in order to minimize the potential for erosion and sedimentation. Consequently, details for the short-term stabilization of the exposed slopes should be provided in individual plans for each of the separate phases.

(5.) Point 12 of the "General Procedures" section of the *Application of Venuti Enterprises, Inc. to Montville Inland Wetlands and Watercourses Commission* indicates that any erosion occurring during the restabilization period "shall be immediately repaired by the Owner, reseeded with the seeding mixtures...and restabilized." It is recommended that any other measures necessary to prevent a recurrence of the erosion be implemented by the owner prior to reseeding and restabilization efforts.

(6.) Clarification needs to be provided regarding the amount of land to be de-vegetated or under active excavation at any one time. According to the "General Procedures" section of the *Application of Venuti Enterprises, Inc. to Montville Inland Wetlands and Watercourses Commission,* active excavation operations will be limited to a maximum

of ten (10) acres. But the Construction Sequencing section of the document states that each phase will be completed and stabilized prior to excavation operations proceeding on subsequent phases. It would be preferable to keep the disturbed area to a minimum because the smaller the area de-vegetated at any one time, the greater the ability to control potential erosion and sedimentation problems.

(7.) The "V" shaped excavation for Phase II of the project, as described on page 7 of the *Application of Venuti Enterprises to Montville Inland Wetlands and Watercourses Commission* and illustrated in the site plan, seems to offer sound protection for the sensitive wetland areas in the area. In addition, the *Conservation Easement Area Reclamation Plan (Appendix B)* appears to provide a sound strategy to promote the stabilization and vegetative recolonization of the area through the use of "wood sod" *(defined on page 2 of Appendix B).*

WETLAND RESOURCES

In general, the materials reviewed by this Team member were exemplary. The plans and reports were obviously assembled with the protection of water resources as a guiding principle.

With no direct impacts to wetlands or watercourses proposed and no watercourses observed in the vicinity of the proposed gravel extraction area, the focus of this section will be on possible indirect impacts to wetland areas on the effected portion of the property. These indirect impacts may include sedimentation resulting from erosion, wildlife disruption and hydrologic alterations.

Gravel extraction is planned for the eastern half of the subject parcel amongst an array of wetland areas most of which are extensions of the Whittle Brook wetland/watercourse system. There are also six small, isolated wetland pockets present adjacent to this large wetland complex. Please refer to Figure 5 for wetland location and identification. Most of the subject wetlands can be classified according to the National Wetland Inventory classification system as palustrine deciduous-forested with the only exception being wetland #1 which is a palustrine scrub/shrub (primarily Buttonbush).

The value of all of these wetlands should be rated as generally high. The wetlands that are contiguous with the Whittle Brook (nos. 1, 4, 6, 7 and 9) serve well the valuable riparian functions of wildlife corridors: flood control, nutrient retention and sedimentation trapping. In addition, the ecological integrity of these contiguous wetlands is high due to the relatively "pristine" condition in and around them, with little or no observable human alteration present.

Wetland numbers 5, 8, 10 and 11 are most likely "vernal pools." Vernal pools are small, shallow, circular depressions in the landscape which fill with water during periods of high spring melt water and storm-water run-off, becoming drier during the

warm summer months. True vernal pools also support unusually high levels 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. Rare and endangered wildlife, primarily amphibian species, are commonly found in these pools. As such these pools would most likely rate high in the "Noteworthiness" functional value category which is heavily influenced by the presence of endangered species.

Wetlands 2 and 3 have relatively low value for any function and exist as a result of previous gravel excavation activities.

In light of the above discussion on the functional value of these wetlands, the preservation of a suitable development "setback" for the purpose of buffering the effects of the proposed development is highly recommended (note possible indirect impacts listed above). The question of "How far is far enough?" has resulted in several studies on the topic. In general, it depends on what function you are trying to preserve. The focus in this case should be erosion control, nutrient retention/sediment trapping, control and wildlife utilization. Buffers suited for these purposes typically range from 50 to 200 feet (the greatest distance needed for the wildlife buffer). The 50 foot buffer currently provided around wetlands should be considered as minimal, but due to the large size of the contiguous wetlands, additional protected uplands, high infiltration rates of the adjacent upland soils and good vegetative cover in the proposed buffer area, 50 feet may be acceptable for most of the wetlands in question.

Instances where the 50 foot buffer may not be sufficient is for the vernal pools present on site. Vernal pools are generally more susceptible to land development activities than other types of wetlands. (Please also refer to Wildlife Resources section.)

Providing adequate upland migration routes for the unique, and in some instances endangered, amphibian species is often the most challenging task involved with

preserving these notable wetland areas. Formulating a protection plan based on predicted migration routes is very useful, but at the same time difficult to establish, due to the amount of field research necessary to accomplish this. One way of predicting these routes is to rule out certain topographic barriers such as steep banks or channels. Fortunately, most of the areas between the vernal pools and the excavation areas consist of steep banks leading toward the excavation area with most of the flatter, easily traversed routes leading toward the undeveloped portions of the site. However, one buffer area which could be expanded is that of wetland #11. Refer to Figure 6 for a diagram indicating a proposed alternative. These changes would greatly expand the area available for upland migration while at the same time preserve the access road for Phase IV of the project.

One indirect impact that deserves more attention is the possibility of hydrologic alterations to wetlands resulting from the removal and regrading of the adjacent uplands. Most of the wetlands on this site appear to receive much of their water from a generalized, pervasive groundwater table due to similarities in their ground elevations. These wetland ground elevations also suggest a slight hydraulic gradient, or slope of the groundwater table, which may exist trending from the northeast down to the southwest of the site. The high infiltration rates of the surrounding soils and lack of surface channels also points toward a heavy reliance on groundwater supplying these wetlands (as opposed to channel inflow or surface runoff). Therefore, it is not likely that gravel excavation in upland areas will effect the hydrology of these wetlands, especially if excavation is kept above the groundwater table.

One exception to this rule may be wetland #4. The ground surface of this wetland is at a markedly different elevation than the others, suggesting that the groundwater supplying this wetland is "perched" above the generalized, pervasive groundwater table supplying the rest of the wetlands. Consequently, the excavation taking place within 50 feet of this wetland will create ground elevations twelve feet below that of the wetland's surface elevation on its western edge. Creating a ground surface gradient or slope which is steeper than the hydraulic gradient of the groundwater table at this

location may result in a "breakout" seepage condition on the cut slope. This would create a more positive flow of water away from this wetland which in effect may begin to de-water this wetland to some extent and will also make vegetative stabilization of this slope very difficult if not impossible.

However, the fact that no groundwater table was detected 75 feet from this wetland (elevation 420') at Test Pit #2 (sample elevation of 400') reaffirms the fact that this wetland reflects a very high hydraulic gradient of a "perched" watertable wetland. Therefore, the planned excavation here will most likely not intercept any groundwater. For further assurance it may be beneficial to install a groundwater monitoring well at the locations indicated on Figure 7 to determine if conditions are similar as in the area of Test Pit #2.

Erosion and Sedimentation

The Erosion and Sedimentation (E&S) Control plan is not particularly a focus of this section of the ERT report, however, a few modifications are suggested.

(1.) It is recommended that the "storm event" mentioned in nos. 9 and 11 of the "General Procedures" in the document entitled *Narrative Description and Construction Sequence Relative to an Excavation Operation on Property Located on Connecticut Route 82, Montville, Connecticut* be further defined as a storm event resulting in a particular runoff depth, usually one of 0.5 inches or greater.

(2.) The word "topsoil" should be substituted for the word "loam" as used throughout the notes section.

(3.) It should be stipulated that one phase needs to be stabilized prior to progressing on to the next. The degree of stabilization should be specified.

(4.) According to the results of TP #6, the bottom of sediment basin #8 in Phase I may be below the groundwater table, which would reduce its sediment storage capacity.

Additional Comments

(1.) During the tree clearing stages, it is recommended that trees be felled away from the vernal pools. Even with the setbacks in place, it is still likely that the crowns of felled trees could reach the pools. If this happens the crown should be cut off and remain in place in order to avoid disruption of sensitive habitat.

(2.) It was stated that two feet separation will be maintained between the excavated surface and the groundwater table. This stipulation should be placed on the excavation plan itself.

(3.) If required as part of the operation, properly designed refueling pads, maintenance areas and storage sheds should be included on the plan.

(4.) The conservation easement mentioned in Ms. Sharp's *Conservation Easement Area Reclamation Plan* should be further defined. Her report states that the easement will "...preclude additional development, other than conservation or open space uses." These "open space uses" and any other restrictions for this area should be entered into the deed of record for this property. In addition, the exact meets and bounds of this area should also be included within the deed, as well as placed onto the site plan.

(5.) "As-built" site plans submitted by the applicant at the end of each phase would aid municipal regulators in assuring that the excavation is being carried out according to plan. Maintaining survey points in areas that are not scheduled to be disturbed should be required to create these plans.

(6.) The document entitled *Narrative Description and Construction Sequence Relative to an Excavation Operation on Property Located on Connecticut Route 82, Montville, Connecticut* should be incorporated into the proposed site plan.

(7.) For this activity, it appears that the applicant will be required to apply to the CT-DEP for a general permit for the discharge of stormwater under the National Pollutant Discharge Elimination System (NPDES) program. For further information on this permit program contact Christopher Stone of the DEP Permitting Enforcement and Remediation Division at 424-3850.

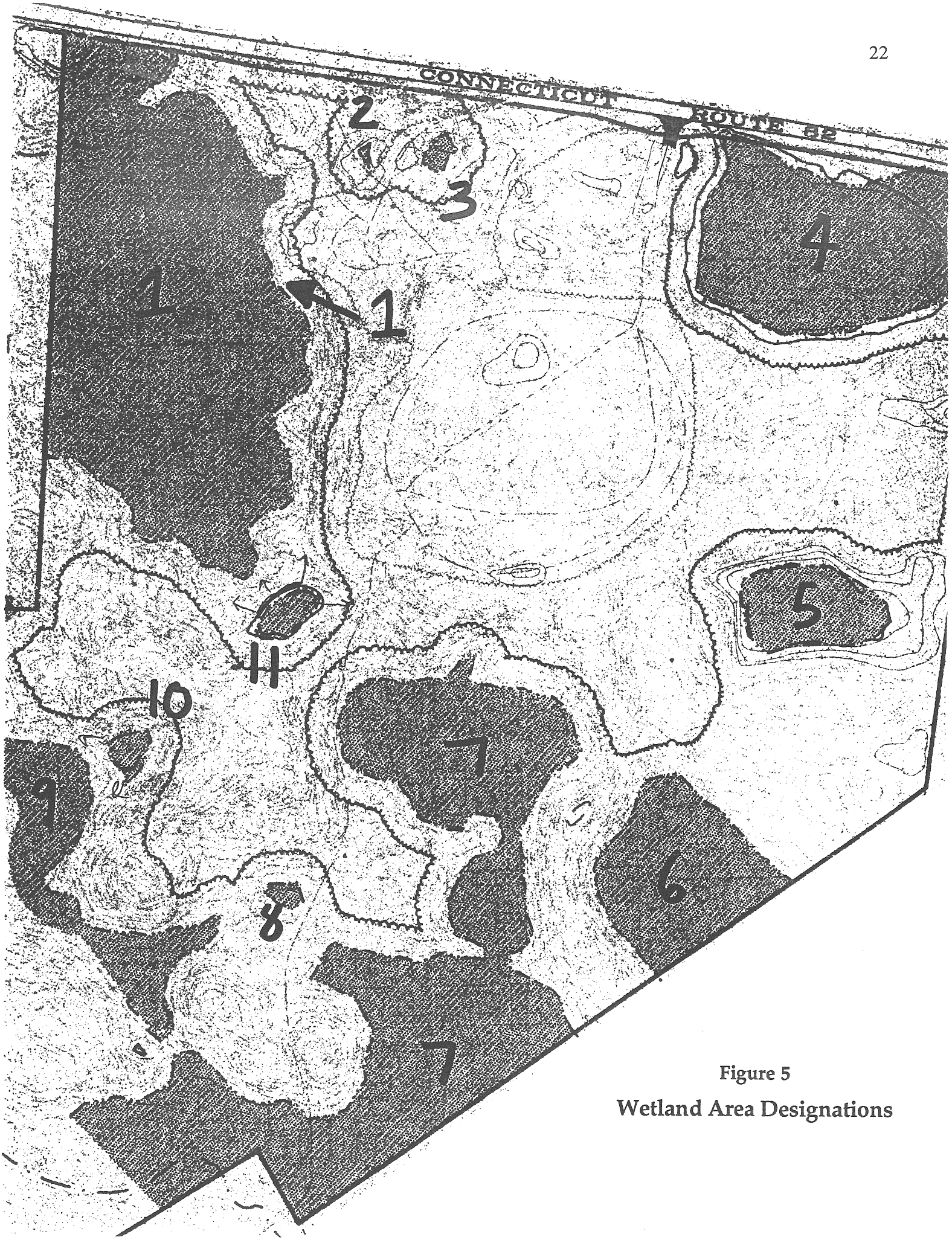


Figure 5

Wetland Area Designations

Figure 6

Proposed Alterations to Clearing Limit Line Wetland #11

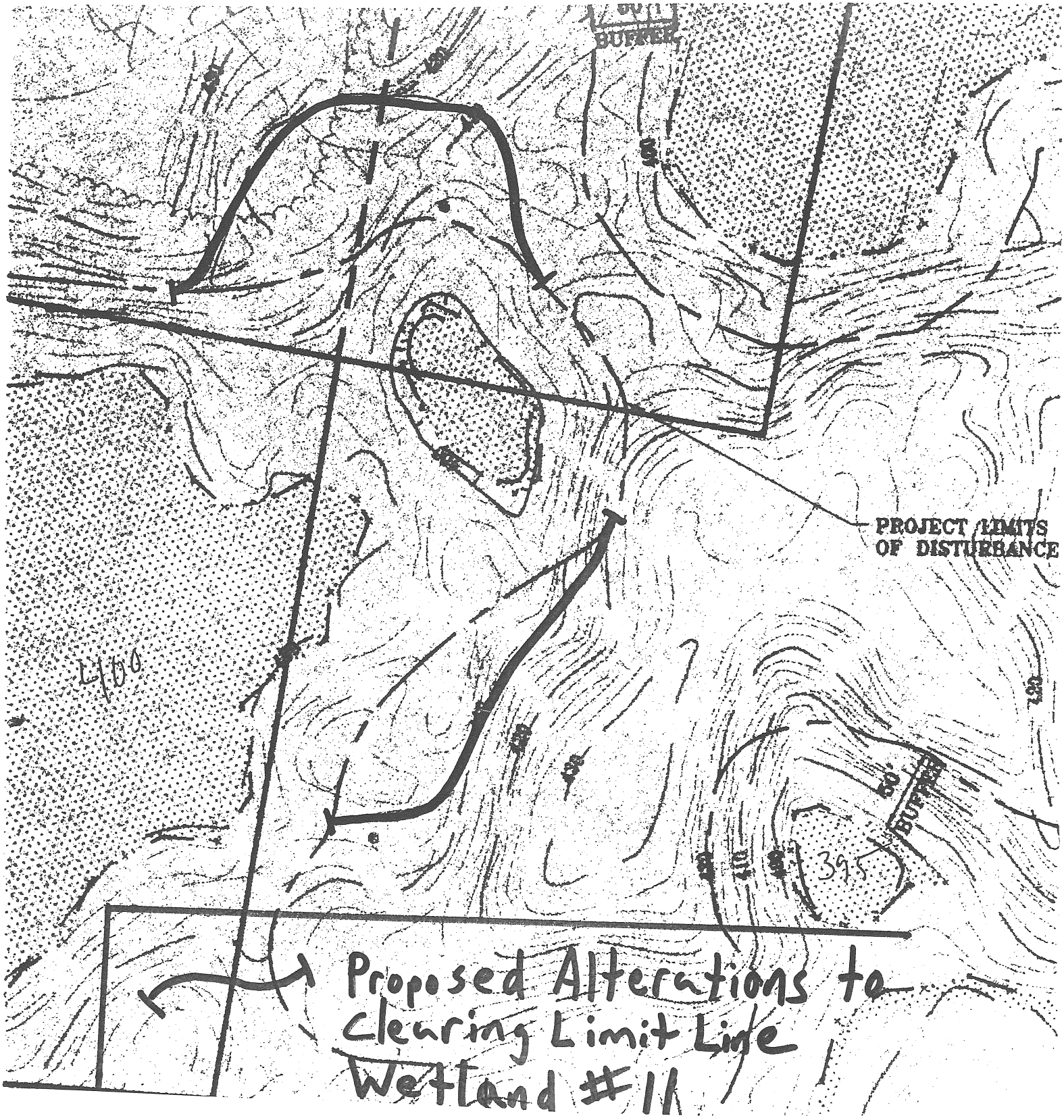
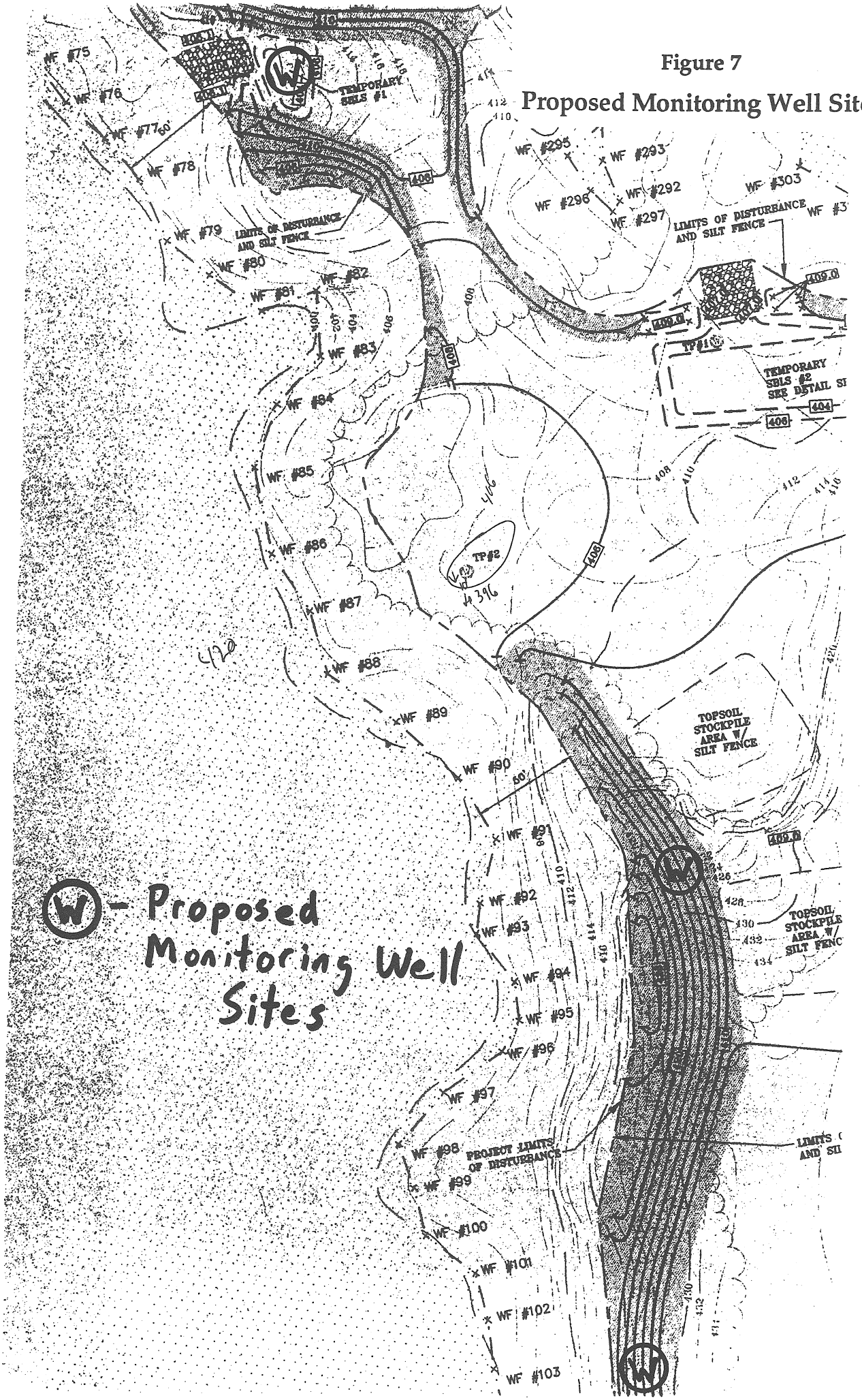


Figure 7

Proposed Monitoring Well Sites



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. (Please also refer to the Wildlife Resources section.)

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 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 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. 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. See the attached sheet on the map for instructions on how to use the map to conduct an endangered species review.

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.

FISH RESOURCES

I. Instream Resources

Whittle Brook has not been surveyed for fish populations by the CTDEP Fisheries Division. Based upon a field review, the stream is expected to support mixed warmwater/coldwater fish populations. Adjacent to the proposed gravel excavation, the stream is of moderate gradient and contains coarse sand and fine silt substrates. Mesohabitat is in the form of long stretches of pool/run habitat and short riffles with small to large gravels. Native brook trout and blacknose dace are expected to inhabit this area of the stream. The stream is very low gradient upstream of the Route 82 roadway crossing. This area is expected to support more warmwater fish such as chain pickerel and stream fish such as white sucker and fallfish. Culverts which convey Whittle Brook under Route 82 are passable for all species of fish. Thus, warmwater fish from Gardner Lake may use this lake tributary stream on a seasonal basis to satisfy various life history requirements. For example, adult white suckers which reside in the lake may make spawning runs up Whittle Brook during March.

II. Impacts

Site soil erosion and sedimentation of Whittle Brook from active mining areas is not expected to be a major concern as long as the erosion and sediment control best management plan is implemented and maintained during the life of the project. All phases of excavation will afford a very large buffer between the limits of disturbance and the edge of Whittle Brook. In some areas, active excavation will be over 400 feet from the edge of Whittle Brook. Although unlikely, if sediment does runoff into Whittle Brook, the following damage to the stream ecosystem 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 populations 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 substrate together. Resident fish may be forced to disperse to other areas not impacted by siltation.
(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.

III. Recommendations

Proper installation and maintenance of erosion/sediment controls is critical to environmental well being. The applicant and the local wetland enforcement officer should be responsible for checking this development on a periodic basis to ensure that

all soil erosion and sediment controls are being maintained. In addition, the applicant should post a performance bond with the town to protect against future soil erosion violations. Past stream siltation disturbances in Connecticut have occurred when individual contractors either improperly deployed mitigation devices or failed to maintain these devices on a regular basis.

WILDLIFE RESOURCES

This review is based on a site visit conducted on November 17, 1997 and review of the application and appendices submitted by Venuti Enterprises, Inc. to the Town of Montville. [Note: *All references made to Phases I - IV in this report correspond to the Phase #s used in the Narrative. Sheet 2 of 9 should be corrected so the Phase #s match those in the narrative, i.e., to reflect the change of Phase IV to Phase II, to eliminate any possible confusion for future site plan reviewers or enforcement officers.]*

I. Habitats

The major habitats present on the property include mature hardwood forest, agricultural field, palustrine forested wetland and palustrine shrub wetland. Whittle Brook and an associated wetland complex comprised of red maple swamp and four isolated wetland pockets (Figure 8: numbered 1 - 4) are located on and adjacent to the project site to the west, south and east. Two additional wetland pockets (numbered 5 & 6) are found within Phase IV, adjacent to Route 82 which runs along the property's northern boundary. The isolated wetlands include a cluster of three vernal pools in Phase II. These wetlands formed in topographic depressions within a closed canopy forest dominated by oaks. Other trees present include black birch, American beech, red maple and hickory. White pine, eastern hemlock and eastern red cedar also are also scattered throughout the project site. Mountain laurel is found throughout the under-story, forming dense stands primarily on the upland slopes. Greenbriar and highbush blueberry are common in the lower elevations. A fourth (numbered as 4) larger open canopy vernal pool dominated by buttonbush is located east of Phase I and south of Phase III. Most of Phase I - IV consist of an open agricultural field currently used for the production of corn.

II. Wildlife Use

Acorns produced by oaks provide excellent forage for a wide variety of birds and mammals including white-tailed deer, gray squirrels, southern flying squirrels, eastern chipmunks, white-footed mice, eastern wild turkeys and blue jays. Snags (standing dead trees), large cavity trees and fallen logs provide feeding sites, shelter, den/nest sites for various birds, small mammals, reptiles and amphibians. Dense stands of mountain laurel and small patches of softwood on the property provide additional cover value for wildlife throughout the year. Many species of birds commonly use forested wetlands, riparian areas and adjacent uplands for breeding, feeding and shelter. Some of these birds include hermit thrush, tufted titmouse, dark-eyed junco, gray catbird, rufous-sided towhee, white-throated sparrow, woodpeckers, common yellowthroat, veery, eastern phoebe, American woodcock, eastern wild turkey, red shouldered hawk and barred owl. Other mammals likely occupying the property include coyote, red fox, eastern cottontail rabbit, raccoon, mink, short-tailed weasel and star-nosed mole.

A diversity of wildlife species are attracted to wetlands due to the complex vegetative structure and an abundance of food in the form of insects, fruits and seeds. Wetlands and riparian areas often provide travel corridors for wildlife moving between fragmented habitats. Ephemeral wetlands, such as the vernal pools found on the property, often provide critical breeding habitat for certain species of amphibians. A diverse group of animals, including birds, small mammals, snakes and amphibians are attracted to vernal pools which serve as important sources of prey during spring and early summer. Based on known populations of amphibians and reptiles in this area of the state and the habitats present, you can reasonably expect to find spotted salamanders, marbled salamanders, four-toed salamanders, two-lined salamanders, dusky salamanders, wood frogs, gray tree frogs, spotted turtles, eastern ribbon snakes (Species of Concern), and possibly wood turtles (Species of Concern) and eastern box turtles (Species of Concern) inhabiting the property.

III. Assessment of Impacts to Wildlife

A. Comments and Considerations

Impacts of Excavation

Direct loss of habitat will lead to a decline in wildlife species diversity and richness on the property. Increased human disturbance will discourage some wildlife species from using the property, especially nesting songbirds from May through July. However, an adequate amount of similar habitat adjacent to the project site should serve as refuge for those birds and mammals with large home ranges that currently occupy the property. One group of species that will be greatly effected by the project is the amphibians. Because amphibians have small home ranges, relatively limited dispersal capability and high site fidelity, they are highly sensitive to local environmental perturbations. The uplands surrounding vernal pools are an integral part of the wetland systems amphibian populations require for survival (M.W. Klemens, Research Scientist, Land Use Planner, Author. Wildl. Conserv. Soc., personal commun., 1998.). Amphibians move an average distance of 500 feet (200-800 feet) into adjoining upland forests to forage. These uplands provide the necessary connections between the vernal pool clusters and other wetlands in the area. Phase II is the primary area of concern. While the 50 foot buffers may be sufficient in protecting the water quality and hydrology, they will not adequately protect the biological functions of the wetland/upland complex for amphibians.

Providing adequate protection for the uplands surrounding vernal pools is critical to maintaining the biological functions of the wetland system (M.W. Klemens, personal commun., 1998.). The reclamation plan does attempt to consider some of the important microhabitat features that upland forests provide for amphibians and other wildlife, i.e., woody debris. However, others features such as a deep layer of leaf litter and patches of canopy shade also are important to amphibians. In addition, the effects of forest canopy removal on soil and water temperature, evaporation rates, the import

of organic material (e.g., leaves and branches) into vernal pools, and amphibian migration, cannot be mitigated by the addition of man-made vernal pools. No published, peer-reviewed reports exist to document that creating or altering vernal pools will be successful or beneficial to amphibians. Also, as suggested by the applicant's consultant, the potential exists for introducing invasive, undesirable vegetation such as purple loosestrife and common reed grass into the easement area and other portions of the property.

Use of the excavated areas by wildlife will depend on what plant species re-vegetate these areas. As described in Appendix A, regular mowing in the reseeded areas at least three times per year will maintain younger, more tender plants which will benefit animals that feed on grasses. However, mowing during the period of May through July may prohibit use of these sites by ground-nesting birds.

B. Other Concerns and Questions

Application - Project Overview ("...the Applicant...has incorporated the recommendations of its environmental consultant...in order to ensure that the amphibian habitat represented by the vernal pools will be properly protected; ... the proposed excavation operation has been designed in order to provide sufficient undisturbed upland areas adjacent to the vernal pools on the site in order to allow amphibian migration to upland areas."):

Based on the comments provided above in section A, the 50-foot buffers would not provide sufficient habitat around the vernal pools for amphibians. Providing even a minimal buffer (200 feet) around the pools would eliminate Phase II from the project.

General Procedure #9: What defines a "storm event"?

General Procedure #12: What measures will be taken outside of the growing season to repair erosion when seeding would not be an option?

Appendix B (The easement will "... preclude additional development, other than open space uses."): What are the accepted conservation or open space uses? These uses and restrictions should be clearly defined and incorporated into the deed of record. Also, the boundaries of this area should be included in the deed, noted on the site plan and marked in the field.

C. Recommendations

Undoubtedly, the most threatened wildlife habitat on the property is the wetland complex that encompasses all of Phase II. Every attempt should be made to maintain the connectivity of the pools to one another and to the adjacent wetlands in this area (M.W. Klemens, personal commun., 1998.). Ideally, the vernal pools should be surveyed and migration routes of amphibians determined prior to project initiation. The buffer between Phase I and the wetland complex to the south should be expanded as much as possible. More specific guidance could be provided once amphibian use and migration routes have been determined. Silt fences/haybales and construction fences should be staggered in shorter lengths so as not to impede amphibian migration. The excavated areas could be enhanced for wildlife by establishing a permanent grass cover on all disturbed areas. In poorer quality soils, warm season grass mixtures are often easier to establish.

This project presents an opportunity to study the effects of this type of land use on vernal pool ecology through the implementation of a long term monitoring project. Ann Kilpatrick, Wildlife Biologist with the Connecticut DEP (860-295-9523), could be contacted for assistance in coordinating this effort.

IV. References

Bevier, L.R. 1994. The atlas of breeding birds of Connecticut. State Geological and Natural History Survey of Connecticut. CT Dept. of Environ. Protect. Tech. Public. Program. Hartford, CT. 461 pp.

Brown, S., M.M. Brinson and A.E. Lugo. 1978. Structure and functions of riparian wetlands. Pages 17-31 in Strategies For Protection and Management of Floodplain and other Riparian Communities. Proc. symp. Dec.11-13. Gallaway, GA. Gen. Tech. Rep. WO-12, Forest Serv., U.S. Dept. Agric., Washington, D.C. 410 pp.

deMaynadier, P.G. and M.L. Hunter, Jr. 1995. The relationship between forest management and amphibian ecology: a review of the North American literature. Dept. Of Wildl. Ecol., University of Maine, Orono, ME. pp. 230-261.

DeGraaf, R.M. and D.D. Rudis. 1986. New England wildlife: habitat, natural history, and distribution. USDA Forest Service Gen. Tech. Rep. NE-108. Broomall, PA. 491 pp.

Donahue, D.F. A guide to the identification and protection of vernal pool wetlands of Connecticut. CT Forest Stewardship Program. 18 pp.

Klemens, M.W. 1993. Amphibians and reptiles of Connecticut and adjacent regions. Bulletin No. 112. State Geological and Natural History Survey of Connecticut. CT Dept. of Environ. Protect. Tech. Public. Program. Hartford, CT. 318 pp.

Pedevillano, C. 1995. Habitat values of New England wetlands. U.S. Fish and Wildlife Service. Concord, NH. 24 pp.

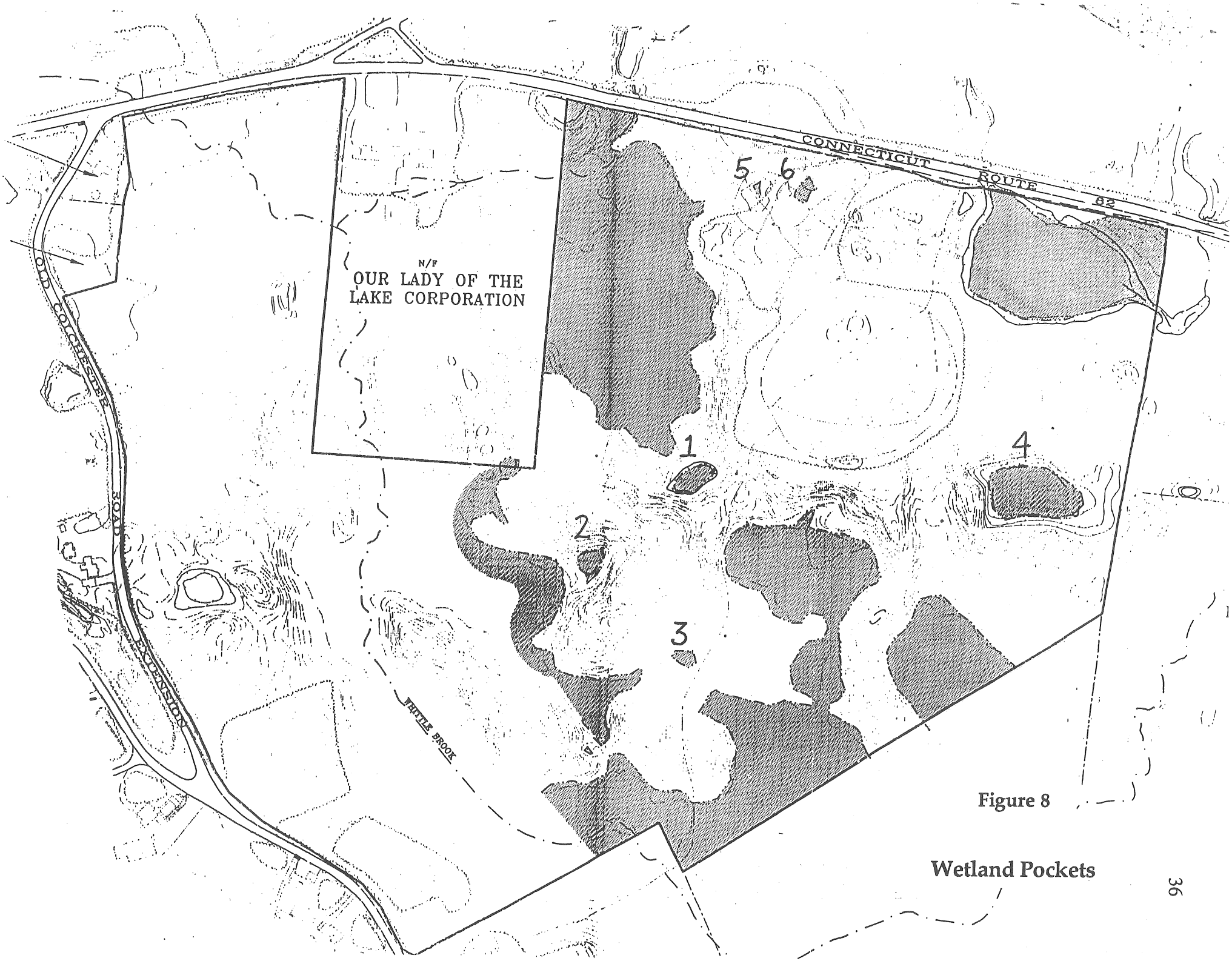


Figure 8

Wetland Pockets

PLANNING REVIEW

The proposed excavation is located in northwestern Montville on the southerly side of Route 82 about one-half mile west of the intersection of Routes 82 and 163. Old Colchester Road Extension serves as the western property line. Surrounding land uses are low density residential and undeveloped, forested land. Higher density residential uses are located about one-half mile south of the site along the northern shores of Oxoboxo Lake. Our Lady of the Lake church is located in the northwestern corner of the property, and commercial uses are found at the intersection of Routes 82 and 163, and at the intersection of Old Colchester Road and Old Colchester Road Extension. On a land use basis the proposed activity should be compatible with surrounding uses.

The area is located in the Water Resources Protection - 160 zoning district which provides for excavations as a special permit in section 5.3.10, according to the provisions enumerated in section 17.8 of the Montville zoning regulations. Because of the undeveloped, low density nature of the area, and the fact that only approximately 20 percent of the property is proposed for excavation, the separation and buffer requirements of sections 17.8.2, 17.8.3 and 17.8.10 of the zoning regulations should easily be met. The proposed excavation is confined to the eastern portion of the property and is well buffered to the residential development to the south by a large area of wetlands soil located adjacent to Whittle Brook on the northern side of Oxoboxo Cross Road and Lake Drive East.

Proposed access to the site is off of Route 82 in the area of the existing driveway to the cornfield. This is probably the best access location, but CONNDOT review and approval is required for items such as site lines, construction entrance, driveway surface, any turning lanes, bonding, etc. In 1996 Route 82 had an average daily traffic count in this location of 6,100. The applicant's estimate of 16-20 vehicle trips per day represents less than one-half of one percent of this total count. This small increase in volume should easily be accommodated without adversely affecting capacity for this

section of State highway. No major highway improvements are indicated in the Regional Transportation Plan for Route 82 in this area of Montville.

APPENDIX