ENVIRONMENTAL REVIEW TEAM REPORT
ON THE
PROPOSED REGIONAL HIGH SCHOOL
HADDAM, CONNECTICUT

MAY 1974

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EASTERN CONNECTICUT RESOURCE CONSERVATION
AND DEVELOPMENT PROJECT
Environmental Review Team
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This report is an outgrowth of a request from the First Selectman and Inland Wetland Commission of the Town of Haddam to the Middlesex County Soil and Water Conservation District (S&WCD). The S&WCD referred this request to the Eastern Connecticut Resource Conservation and Development (RC&D) Project Committee for their consideration and approval as a project measure. The request has been approved and the measure reviewed by the Environmental Review Team.

The soils of the site were mapped by a soil scientist of the USDA Soil Conservation Service. Reproductions of the soil survey and a table of limitations for urban development were forwarded to all members of the Team prior to their review of the site.

The Team that reviewed the proposed school and affected wetlands consisted of the following personnel: Barry Cavanna, District Conservationist, Soil Conservation Service (SCS); Dwight Southwick, Civil Engineer, SCS; Timothy Dodge, Biologist, SCS; Peter Dodds, Student Biologist, SCS; Sidney Quarrier, Geologist, Natural Resource Center, State of Connecticut Department of Environmental Protection; Stephen J. Holmes, Regional Planner, Midstate Regional Planning Agency; Barbara A. Hermann, Team Coordinator, Eastern Connecticut RC&D Project.

The Team met and reviewed the site on April 25, 1974. Reports from each Team member were sent to the Team Coordinator for review and summarization.

This report is not meant to compete with private consultants by supplying site designs or detailed solutions to development problems. 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 of Haddam. The results of this Team action are oriented toward the development of a better environmental quality and the long-term economics of the land use.

The Eastern Connecticut RC&D Committee hopes you will find this report of value and assistance in making your decisions on this particular site.

If you require any additional information, please contact: Miss Barbara A. Hermann (889-2324), Environmental Review Team Coordinator, Eastern Connecticut RC&D Project, 139 Boswell Avenue, Norwich, Connecticut 06360.

INTRODUCTION

Regional School District 17, including the towns of Haddam and Killingworth, are proposing to expand the existing Haddam Junior High School on Little City Road to accommodate Senior High School students as well. Included in the proposal is the construction of several athletic fields. The three most southerly fields, soccer, boys' softball, and girls' softball and hockey, would require the filling of about 5 acres of inland wetlands soils and a southerly relocation of Ponset Brook around the boys' softball field.

In accordance with Public Act 155, Regional School District 17 has applied to the Haddam Inland Wetland and Water Courses Agency for a permit to fill the wetlands for the development of the recreational facilities. To assist in making their decision, the Agency has requested the Environmental Review Team to evaluate the impact the filling would have on such items as stream flow, flood storage, and wildlife.

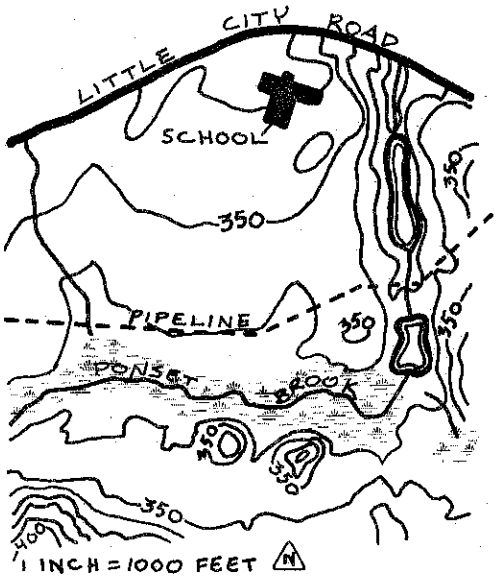
In evaluating this proposal, it is first necessary to identify the existing natural resources and their present value. From this basis, the impact of the proposed development can be better understood. In addition to the actual filling, both the storm drainage and on-site septic systems should be reviewed in relation to their impact on the wetlands. Finally, the alternatives which exist for using the wetland area as well as alternatives for fulfilling the recreational needs of the school must be considered.

The issue that will ultimately be decided by the Haddam Inland Wetland and Water Courses Agency is whether the extensive filling and grading of the wetlands is worth the benefits of the proposed use. This report will attempt to provide information on the existing resources, probable impact of the development, and alternative uses for the wetland area to assist in the decision-making process. However, it should be emphasized that any comments or recommendations made in this report are presented for the consideration by the Town and should not be construed as mandatory or regulatory in nature.

EXISTING RESOURCES

Description. The topography map below shows the location of the existing Junior High School in relation to the Ponset Brook. The major wetland area lies to the south of the buried telephone right-of-way (pipeline). The proposed school buildings will be located directly south of the existing buildings, with the recreational facilities further south. As mentioned before, the three most southerly athletic fields would encroach upon the wetland and require a relocation of Ponset Brook. The south end of the proposed football field also encroaches upon a wetland area, but not as extensively.

TOPOGRAPHY



Ponset Brook originates from a series of smaller tributaries and associated wetlands upstream in the vicinity of Cockaponsett State Forest. Along its entire length, this stream receives water from lesser tributaries. Higganum Reservoir, downstream of the site, is owned by the State of Connecticut and utilized as a park.

The wetland stream system under consideration starts at the ponds southeast of the Junior High School and extends about a mile and a half upstream along Ponset Brook. The smaller pond, about 3/4 acres in area, is on school property while the larger pond downstream is on private property. Above and below this wetland area, Ponset Brook is more of a defined stream with less extensive adjacent wetlands.

To the south of the school, the wetland system is about 500 feet wide. In this area Ponset Brook does not flow in a single well-defined channel. The major

flow goes through the center of the proposed boys' softball field through a series of interconnected small channels which are 2-3 feet deep. This area of channels appears to be centered on the stream which is drawn in on the site plans. Bordering this channel system on either side is an area of swampland with a slightly slower flow of water, but still intimately associated with the channel system.

The wetland area in question is wooded with trees such as red maple, white oak, white ash, wild cherry, and occasionally gray birch and white pine. The understory includes blueberry, alder, dogwood, mountain laurel, and staghorn sumac. The ground cover includes ground pine, mosses, ferns, and skunk cabbage, while cattails grow where there is standing water. The wetter areas along the stream course include rushes, sedges, and other wetland plants.

The present stage of succession is such that the canopy or overstory formed by the trees allows sufficient light penetration to ensure growth of understory shrubs. However, trees in the drier areas are rapidly approaching a point where the canopy will be dense enough to shade out many of the understory plants.

A detailed soils map of this site is given in the Appendix to this report along with two charts, one giving soil limitations for on-site sewage and athletic fields and the other giving soil suitabilities for wildlife habitat development. Due to the original scale at which the soils are mapped (1"=1,320') the lines shown on the soils map should not be viewed as precise boundaries, but rather as guidelines to the distribution of soil types on the property.

Though three soils on the site are classified as inland wetlands, 43M, 464, and 823, only 823, Saco silt loam, would be affected by the construction of the athletic fields. This is a very poorly drained silty soil with a ground water table that is on or near the surface from late fall through early spring. Most areas are flooded rather frequently.

Hydrologic Function. The wetland provides through flowing drainage for Ponset Brook. The network of channels and broad swampland tends to reduce the extremes of flow. Flood waters coming down Ponset Brook tend to spread out over the wetland, slowing down their arrival at downstream areas and tending to reduce the flood heights.

In conjunction with flood control, wetlands release water slowly, thus helping to regulate streamflow. It cannot necessarily be said that the wetland maintains additional summer flow to downstream areas, however. It is possible that summer water loss in the swamp due to evapotranspiration may exceed the amount of summer flow augmentation.

The network of channels and swampland tends to reduce stream velocities during normal flow as well as flood periods. This reduction in velocity allows suspended sediment to settle out, thus reducing the amount of sediment which is carried to downstream areas. As a result, the water tends to be clearer and more suitable for water life. This sediment collecting function was observed in the small channels in the area of the proposed softball field. Small deltas of silt and sand were being deposited in the deeper pools in this area. As the upstream areas on Ponset Brook become more developed in the future, the sediment collecting function of this wetland may become much more important for keeping the increasing sediment load out of downstream areas, such as the Higganum Reservoir.

Wetlands also function as groundwater recharge and discharge areas. This reversible function tends to balance out the hydrologic system, allowing it to survive natural and man-made stresses. This balancing function may become more important as the remainder of the drainage basin becomes more developed.

Wildlife Value. The more wooded area north of the stream course is of moderate value to woodland wildlife. Wildlife species which utilize this type of habitat include ruffed grouse, white tailed deer, squirrels, gray fox, raccoon, woodpeckers, and songbirds. The present understory provides food in the form of berries, seed, and browse. In addition, many of these plants provide winter protection for wildlife and nesting areas for birds. Some of these wildlife values will be reduced as the overstory matures and shades out the less tolerant shrubs and vines.

A shrubby border exists between the fields and the woodland and again between the stream area and the woodland. These areas are food producers and have value as protective cover.

The small pond together with the wetland area characterized by reeds, sedges, grasses, and other wetland plants have a high value for wetland wildlife. Open water in conjunction with wetland plants offers a highly desirable situation for waterfowl. Black and Mallard ducks use this type of area for nesting, feeding, rearing young, and loafing. Wood ducks will utilize the more wooded areas for their needs. Muskrats often burrow into the streambanks and utilize the wetland plants for food. Beaver cuttings along the pond edge, although old, indicate beaver activity in the area.

The wetlands also provide resting areas for larger wildlife during the day. This particular area also has an added value of providing a corridor or travel area connecting Cockaponsett State Forest upstream with lands of wildlife value downstream.

Fish Value. The smaller pond, the swampy area above it, and Ponset Brook proper compose the resources as they relate to fish habitat. The Connecticut Department of Environmental Protection lists Ponset Brook as a good, small stream, trout fishing area. Upland streams and their tributaries of this type typically support small populations of native brook trout.

Visual observations indicate water quality in Ponset Brook is very good. The stream flow is perennial, and contains sufficient nutrients to support algae growth, basic to food chains. Wetland areas such as the one in question maintain the productivity of streams by breaking down organic matter and recycling the nutrients. In addition, the wetland above the pond may serve as a nursery for panfish, minnows, and possibly bass. The pond will support the adult populations of panfish, minnows, and bass if present.

Recreational Value. Wetlands can serve as a resource base for both active and passive recreation. Activities include painting, photography, hiking, and nature study. Wetlands also lend themselves readily to outdoor classroom areas.

PROBABLE IMPACT OF PROPOSED DEVELOPMENT

The plan as proposed calls for the clearing and filling of about 5 acres of wetlands and the rerouting of 250 to 300 feet of Ponset Brook. Approximately 30 to 60 percent of the width of the local wetland area would be filled and turned into dry land. However, the area of impact would extend beyond the edge of the filled land.

There was some question as to whether the stream channel to be rerouted was the main stream of Ponset Brook or a tributary or side stream. Two complete traverses across the swamp were made by a Team member to check this. The channel area in question was the largest one crossed with the greatest amount of flow. It is therefore believed to be the main stream of Ponset Brook.

Hydrologic Effect. The existing flood plain of Ponset Brook in the area of the proposed filling is about 450 feet wide. This land floods frequently during periods of high runoff throughout the spring and fall. Rerouting the brook to a channel with a bottom width of 12 feet and a 2:1 side slope would greatly restrict the flow of water through the existing swamp. The water will reach a higher stage in the new channel than would be expected in the swamp.

At times of peak discharge, this situation might also create slightly higher ground water levels under the new athletic fields. The extensive filling and the reduction in water loss from evapotransporation due to the removal of wetland vegetation would also tend to result in a rise in the ground water level. With the proposed leaching field located under the large baseball field, a rise in ground water levels may be of critical importance. This will be discussed in further detail later in the report.

Downstream flood levels would also tend to increase with the loss of a substantial portion of the wetlands. The retention capacity of the area will be reduced and will result in a greater amount of runoff occurring in a shorter period of time.

Silt and Sedimentation. Silting and sedimentation arising from both the filling of the wetlands and the rerouting of Ponset Brook are problems that may be minimized and controlled to a certain extent, but which cannot be eliminated completely. The fill to be placed in the wetland would be about three feet deep. In order to fill the area causing a minimum of damage, brush and trees should be cut flush with the ground, removed, and chipped. Stumps should be left since removal would create a major source of silt pollution downstream. The actual filling should be controlled and scheduled so that surface runoff would not cause silting in the stream.

Silting resulting from construction of the new stream channel could be reduced by excavating the channel completely before allowing the stream to flow into it. Getting the excavation machinery across the brook would cause silting downstream. Unnecessary crossing should therefore be avoided.

A good vegetative cover on the streambanks would also be necessary to prevent erosion after the brook is rerouted into the new channel. The stream slope, taken from the USGS topographic maps, is about .24 percent. Assuming a stream depth of 4 feet in the new channel, the velocity would be about 5 feet per second. This velocity would be erosive in most soils unless there was a very good vegetation established.

Whether the wetlands are filled or left in their present condition, the outlets of each of the storm drainage systems should have a stilling basin or silt trap to dissipate the energy from flowing water and to collect sediment. A small basin similar to those used on the state highways should be adequate and should prevent a scour hole at the outlet end.

Wildlife. Cutting the trees, and clearing and filling the wetland will reduce the amount of woodland and wetland wildlife habitat available to wildlife in the area, forcing them to move into surrounding areas. The immediate effect of encroachment may not be severe because other relatively undisturbed wetland is available. However, the total picture should be considered. Often the small scale filling is most destructive in the long run, because the total natural resource used or remaining is not fully realized. The end result can be that certain wildlife species are forced out of the area entirely.

Fish. The immediate impact on fish and fish habitat from filling and rerouting the stream may be more serious. Construction work in the stream channel will increase stream turbidity, streambank erosion, and downstream movement of sediment.

The movement of large amounts of sediment may fill valuable pool areas which serve as fish habitat. The pond area is also subject to sediment movement and will act as a settling basin. This is a natural aging process, but may be accelerated if large amounts of sediment from wetland development and stream rerouting are allowed to move downstream. The result would be a decrease in the value of the pond as fish habitat. In extreme cases plants and aquatic invertebrates may be covered by sediment and made unavailable to fish and wildlife. In very turbid waters fish may have difficulty locating food.

The proposed rerouting of the stream with a trapezoidal design channel may increase downstream water temperatures, due to a larger area of water exposed to direct sunlight than occurs under natural stream conditions. The probability that stream shading vegetation will be lost also exists. Modified streams usually become uniform in design and gradient and consequently lose their diversity. Diversity is necessary for the maintenance of a good quality natural fishery. With the proposed action there also exists the possibility of losing any fish nursery associated with the section of stream to be rerouted and the wetland to be filled.

Waste Disposal. The effective operation of the school's waste disposal system is of particular importance in maintaining the high quality of water in this wetland stream system. While the Team was on the site, several holes were dug in the area of mid-center field and mid-left field of the proposed baseball diamond at the locations of previous test pits. Ground water levels were found to be about 18 inches below the surface in mid-center field and 24 inches in mid-left field. These holes were not left open, so static water levels might be slightly higher. The water levels were confirmed by the presence of standing water in the swale just to the west.

From this it is estimated that standing water levels in the middle of the baseball field, which is the location for the proposed leaching fields, are at or above 81.5 feet. This will tend to rise slightly to the north under homeplate of the proposed ball field. The site plan shows the elevation of the leaching pipes to be in the range of 82.5 to 83.5 feet. Under the present water

conditions, this leaves one to two feet between the leaching pipes and existing ground water levels. The distance between the leaching trenches and ground water would be even less and might possibly intersect.

Proposed site alterations would appear to aggravate this situation by raising the ground water. These changes include restriction of water movement through the new stream channel, reduction of water loss by evapotranspiration, addition of five feet of fill in the area of the leaching field, and discharge of large amounts of water into the ground tending to mound the water table. Also to be considered is that this has been a fairly normal spring and that in wetter years the seasonal rise in the water table would be greater.

The proposed system appears to be designed at or below minimum standards, assuming that the ground water levels will never be any higher than at present. The design severely limits the probability of effective renovation of wastes in the unsaturated soil zone, and if the water table should rise much, the system may be prone to actual failure.

Some on-site subsurface drainage is proposed, but its effectiveness will be limited by the lack of topographic relief, unknown distribution and permeability of ground materials, and the low gradient of the ground water table. The amount of ground water buildup under the leaching field has not been determined, and it is almost impossible to determine within the tolerances necessary for the designed system.

It is recommended that the plans for waste disposal be reviewed to allow for higher water tables. A placement of pipes at 85.5 feet would allow 18 inches for gravel, 18 inches to groundwater, and a 12 inch margin for "wet" years and/or ground water buildup. From the above observations and evaluations, this would be the minimum desired. The effective operation of these leaching fields will be of particular importance in maintaining the quality of Ponset Brook.

AT&T Right-of-way. Much of the proposed filling, grading, and construction involves land now used as a right-of-way for an AT&T underground cable. If it has not already been done, the AT&T officials in New Haven should be contacted to determine the proper procedures and precautionary measures to be used in undertaking this type of activity. The telephone numbers to call in New Haven are: 771-2267 for the Operations Manager and 771-6282 for the District Supervisor.

ALTERNATIVE USES

Listed below are several alternatives which exist with respect to the future use of the wetland area.

1. Develop the area as proposed for athletic facilities, using all possible precautions to minimize damage to remaining wetlands and Ponset Brook.

2. Leave the wetland area in its present state.

3. Develop wetlands into a comprehensive nature study and wildlife management area for educational and recreational use.

This report has dealt with the probable impact of the first alternative. In order to pursue alternative 2 or 3, three of the proposed athletic fields would have to be either relocated or eliminated entirely from the plans. Land adjoining the present school property should be considered for possible purchase, if found to be suitable for athletic fields. The possibility of multiple use of some of the other proposed fields should also be explored, such as using the Little League Field during school hours for girls' and/or boys' softball.

Alternative 2 would require no site improvements, as well as no filling. Use of this area would be expected to continue as at present in a fairly limited fashion. As noted earlier in this report, if left as is, the area will lose some of its wildlife value as the overstory matures.

Alternative 3 would take full advantage of the unique opportunity available to the school, in that a wetland area, stream course, and pond all fall within school controlled lands. A wildlife habitat management course could be developed using the area as an outdoor laboratory. Wetland habitat can be developed on much of the area with only moderate limitations, as indicated on the Soil Suitabilities Chart in the Appendix. Woodland wildlife habitat could also be improved, though wet soils will impose certain problems.

Self-guided nature trails, photography blinds, wildlife feeding stations, picnic sites, bird watching areas, painting areas, and outdoor classrooms could all be developed with little difficulty. The pond could be cleaned out and reconstructed for wildlife and stocked with fish.

From an environmental and educational viewpoint it appears the most desirable solution would be to delete or relocate the three most southerly athletic fields, refrain from filling the wetland and rerouting Ponset Brook, and to preserve, maintain, and manage the wetland for educational, recreational, and wildlife use.

ADDITIONAL COMMENTS AND RECOMMENDATIONS

Since this is a major filling operation being proposed, the Haddam Inland Wetland and Water Courses Agency should be aware of any precedents being set here. If the Town permits a municipal facility to encroach upon a major wetland system, it may be more difficult to persuade private residents to properly manage their own wetlands.

The wetland, if left intact, could serve a major educational function for the school system by providing an ideal outdoor laboratory, stressing an understanding of the natural environment and its systems, and by providing a specific example of sound land use planning and resource management.

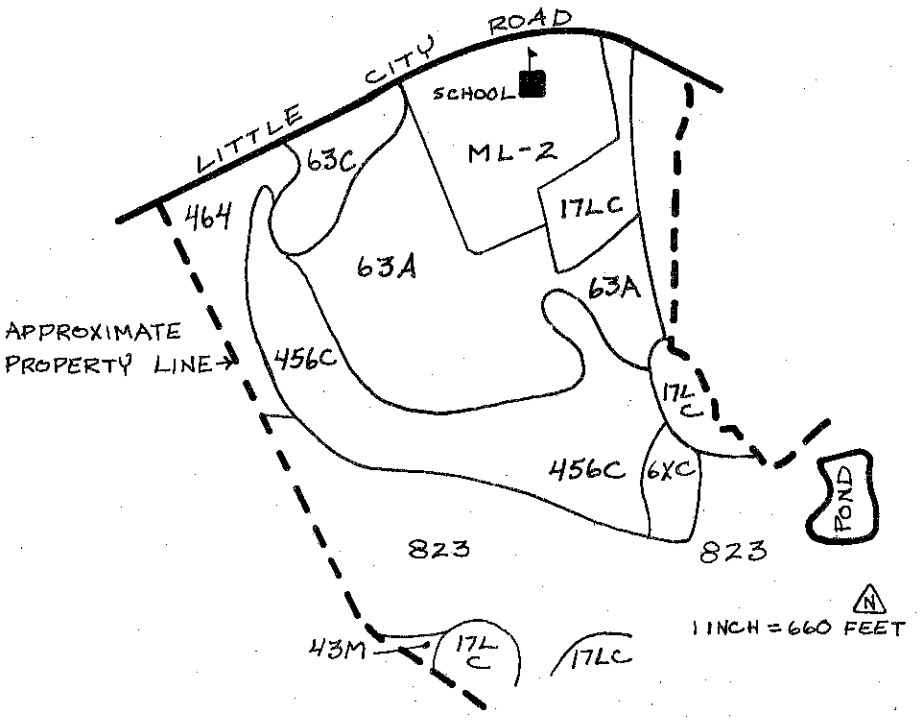
APPENDIX

SOIL MAP

PROPOSED REGIONAL HIGH SCHOOL

LITTLE CITY ROAD

HADDAM, CONNECTICUT



Prepared by: UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service

ADVANCE COPY, SUBJECT TO CHANGE *APRIL, 1974*

SOILS LIMITATIONS CHART

Natural Soil Group*	Mapping Symbols	Soil Name	Limitations for:** On Site Sewage	Limitations for:** Athletic Fields	Principal Limiting Factor(s)
A-1a	63A	Enfield gravelly silt loam.	1	1	None.
A-1b	63C	Enfield gravelly silt loam.	2	3	Slopes 3-15%.
A-2	456A	Sudbury sandy loam.	3	2	Seasonal high water table.
A-3a	464	Walpole sandy loam, fine sandy loam.	3	3	High water table.
B-1c	6XC	Canton very stony fine sandy loam.	2	3	Stoniness, slopes 3-15%.
B-3b	43M	Leicester, Ridgebury, and Whitman very stone fine sandy loam.	4	4	High water table, stoniness.
D-1	17LC	Hollis-Charlton rocky complex.	3	3	Shallowness, slope 3-15%.
E-3b	823	Saco silt loam.	4	4	Flood hazard, high water table.
Not Classified	ML-2	Borrow and fill land, coarse materials.	Suitability can only be determined by on-site investigation.		

* Refer to Know Your Land, Natural Soil Groups for Connecticut, Soil Conservation Service, USDA Connecticut Cooperative Extension Service, for further explanation of the natural soil groups.

** Limitations: 1-slight; 2-moderate; 3-severe; 4-very severe. Limitations even though very severe, do not preclude the use of the land for development. If economics permit greater expenditures for land development and the intended objective is consistent with the objectives of local and regional development, many soils and sites with difficult problems can be used.

SOIL SUITABILITIES* CHART

FOR CREATION, IMPROVEMENT OR MAINTENANCE OF WILDLIFE HABITAT.

Natural Soil Group	Mapping Symbol	Wildlife Classes**		
		Wetland	Openland	Woodland
A-1a	63A	4	3	3
A-1b	63C	4	3	3
A-2	456A	4	1	1
A-3a	464	2	3	2
B-1c	6XC	4	2	1
B-3b	43M	2	3	3
D-1	17LC	4	3	2
E-3b	823	2	3	3

* Definition of suitabilities: 1-well suited; 2-moderately suited; 3-poorly suited; 4-very poorly suited.

** Openland wildlife - Bobwhite quail, ring necked pheasant, cottontail rabbit, red fox, woodchuck, and songbirds.
Woodland wildlife - wild turkey, ruffed grouse, squirrel, gray fox, raccoon, white tailed deer, songbirds, woodpeckers.
Wetland wildlife - ducks, geese, heron, occasional shorebirds, muskrat mink, beaver, otter.