TMC Associates, L.P.
Retail Development

Old Saybrook, Connecticut

EASTERN CONNECTICUT ENVIRONMENTAL REVIEW TEAM REPORT

Eastern Connecticut Resource Conservation & Development Area, Inc.

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Old Saybrook, Connecticut

Environmental Review Team Report

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

for the

Inland Wetland Commission
Old Saybrook, Connecticut

May 1996

CT Environmental Review Teams
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Acknowledgments

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

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

The field review took place on Tuesday, April 2, 1995.

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I would also like to thank Don Lucas, Old Saybrook Inland Wetland Enforcement Officer, Chester Sklodosky, Old Saybrook Zoning Enforcement Officer, Penni Sharp, environmental consultant for the town, members of the Inland Wetland Commission, Zoning Commission, Planning Commission, Wilma Asch, Executive Director of the Economic Development Commission, and Gary Sharpe and Richard Snarski representatives of the developer for their cooperation and assistance during this environmental review. I would also like to thank Wayne DeCarli, planner, CT DOT and Julie Shane-Kiritsis, environmental analyst, CT DEP for attending the field review and Arthur Castellazzo, sanitary engineer, CT DPH for his input.

Prior to the review day, each Team member received a summary of the proposed project, location and soils maps, and copies of relevant reports. During the field review the Team members were able to view additional maps and information at the town hall. The Team met with and were accompanied by town officials and representatives of the developer. 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 designs or detailed solutions to development problems. The Team does not recommend what final action should be taken on a proposed project - all final decisions rest with the Town. This report identifies the existing resource base and evaluates its significance to the proposed 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 making your decision on this proposed retail development.

If you require additional information please contact:

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Introduction

An environmental review was requested by the Old Saybrook Inland Wetland Commission (with concerns of the Zoning Commission added) on a proposed retail development.

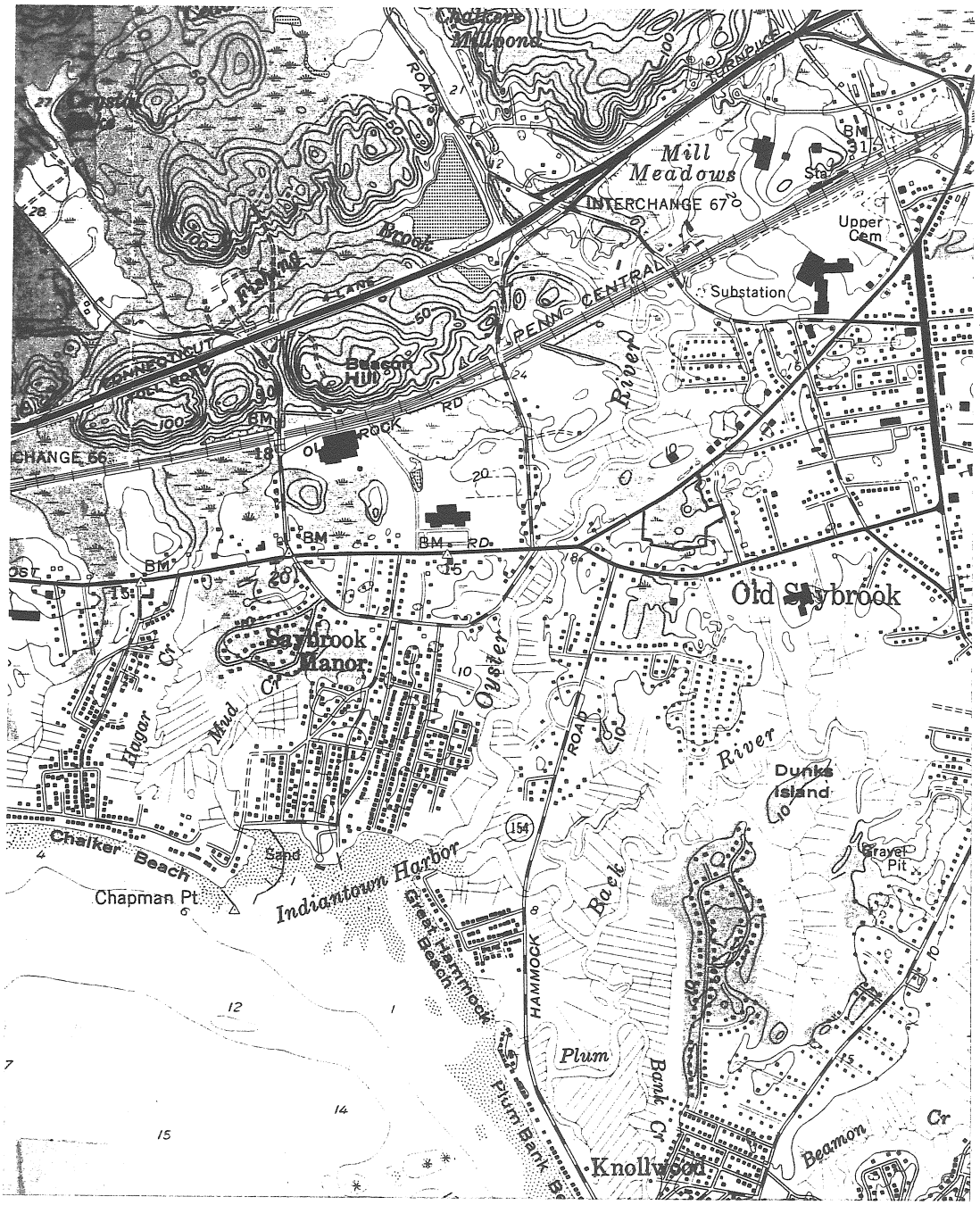
The 9.7 acre site is located on the south side of the Boston Post Road (Route 1) in a B-2 shopping center business zone. A 34,300 square foot building is being proposed which requires a Special Exception Permit because of the size and number of parking spaces required. The building will house two retail stores with on-site sewage disposal and public water.The site contains both inland and tidal wetlands, with the inland wetlands having been disturbed by cuts and fills sometime in the 1980's. The site contains ledge that will need to be blasted and the intent is to use the material on site for fill. The applicant is proposing to fill a portion of inland wetland that has already been "degraded" and to restore "despoiled" inland wetlands to create additional wetland in the form of marsh and pond.

The Inland Wetland Commission is primarily concerned with the impact to the inland wetlands on the site and the Zoning Commission is concerned with off site inland and tidal wetland impacts, site design compatibility and traffic and access. This report provides a description of the on-site natural resources and an assessment of the site's natural resource opportunities and limitations. Also included are planning, management and land use guidelines, the identification of problem areas and recommendations to mitigate negative impacts.

Location and Topographic Map

N

Scale 1" = 2000'



Soil Resources

The soils within the project area include: Charlton-Hollis (CrC), Hinckley (HkC), Westbrook (We), Walpole (Wd), according to the Soil Survey of Middlesex County (1979). On-site soils investigations, submitted by the applicant, indicate that a large portion of the area has been previously disturbed by land grading and cut andfill activities. Therefore, on-site adjustments may be needed during construction to address the limitations and recommendations in this report. The primary limitations for these soils, associated with on-site septic systems include, but are not limited to: flooding, large stones, seepage, slope, and wetness. These limitations do not preclude development, but require careful consideration during the planning and implementation process to minimize the disturbance to the soil resources in particular and the total natural resources in general. Recommendations to address these limitations are listed below.

• Retail Development Recommendations

The limitations which may be associated with this retail development do not necessarily preclude development. The following recommendations will address the limitations associated with, but not limited to, this retail development in order to provide guidance to minimize disturbance to the soil resources during the planning and implementation process.

• **Flooding:** This limitation for **We** is rated severe. **We** is a wetland soil. Septic systems and associated components are not recommended for wetland soils due to the high potential for problems, such as system backup, during wet and flood conditions.

•**Large Stones:** This limitation for **CrC** is rated moderate to severe. Large stones and boulders are often associated with this soil and often require extensive land preparation for a septic system. In some instances, the cost may outweigh the benefits or the location. On-site adjustments may be needed during construction to properly and economically locate the system.

• **Seepage:** This limitation for **CrC** and **HkC** is rated moderate to severe and for **Wd** is rated severe. Seepage can cause the slopes of excavations to become unstable. Limitations and recommendations under "slope" are applicable for seepage.

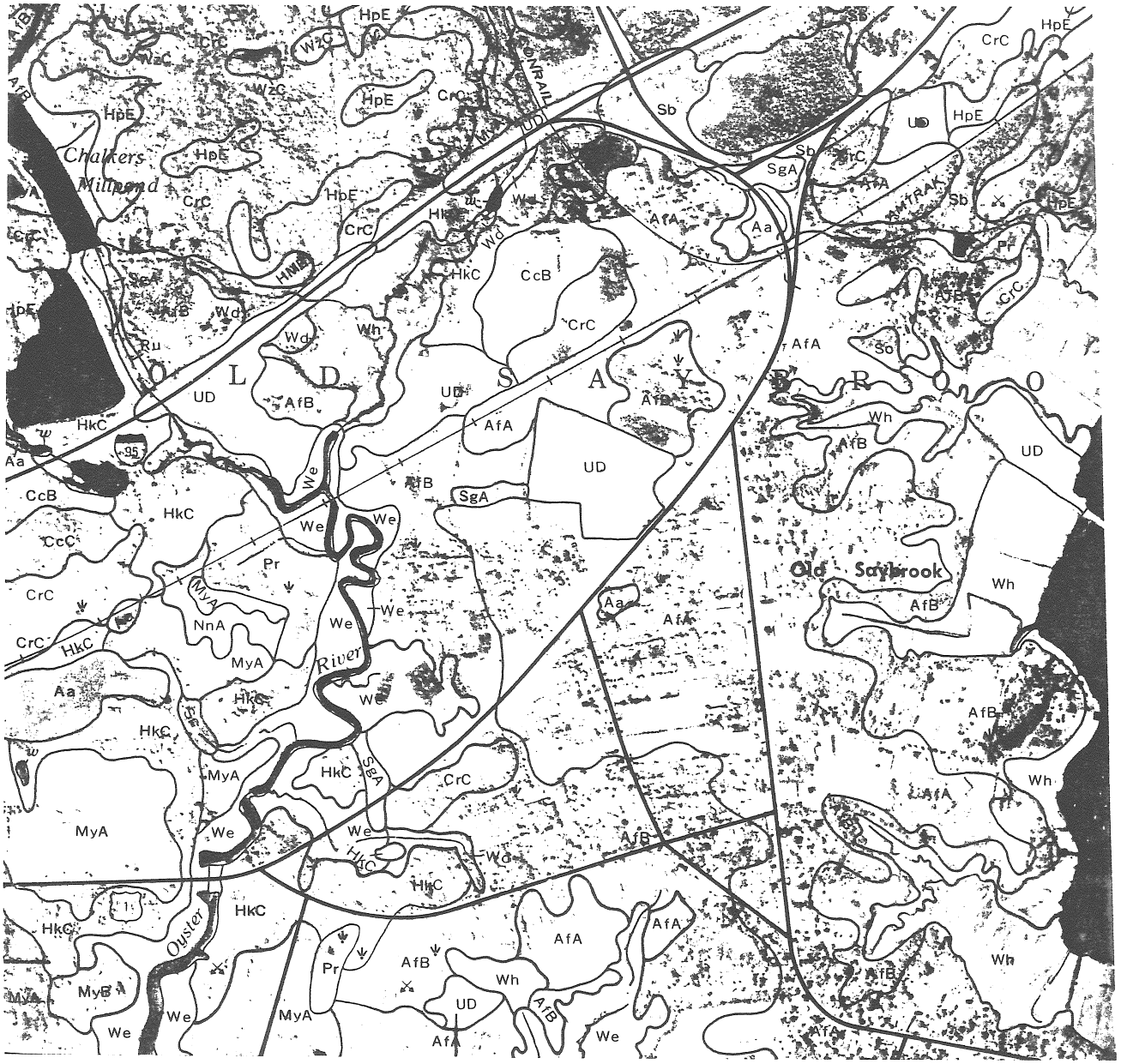
• **Slope:** This limitation for **CrC** and **HkC** is rated moderate to severe. Steep side slopes of excavations are unstable, and on-site septic systems require careful design and installation, especially if slopes are greater than 15 percent.

• **Wetness:** This limitation for **We** and **Wd** is severe. **Wd** is a wetland soil. Limitations and recommendations under "flooding" are applicable for wetness.

Soils Map

N

Scale 1" = 1320'



Soil and Water Conservation District Review

The following comments and recommendations refer to the erosion and sediment (E&S) control plan and the stormwater management plan specifically and the plans in general.

1. The signature of the soil scientist for the project should be on the plans. Also, the name of the person to be in charge of the maintenance and installation of the E&S controls should be on the plans.

2. The location of soil stockpile areas, surrounded with E&S controls, should be on the plans. This will be especially important for the wetland restoration areas so that off-site problems do not occur.

3. The construction entrance, as shown on the detail sheet, should be on the plans.

4. Calculations should be shown for the design of the sedimentation basin. It needs to be of proper dimensions for it to function correctly during construction. It should have the proper riser and spillway for use during construction. Also, the narration should state that the sediment basin should be constructed first and be fully stabilized before the rest of the stormwater drainage system is tied into it.

5. To increase the residence time for stormwater in the pond, and therefore increase the pollutant removal, a berm should be placed near the inlet to the system, directing the water to the east. If this is not done, there is a great potential for the water to flow out of the system almost as soon as it enters, given the close proximity of the inlet to the outlet of the system.

6. Orange construction fencing should be used to show limits of construction to help protect wetland areas. Silt fence should not be used for this purpose only if no erosion control is necessary.

7. Provisions should be made for the maintenance of the sedimentation basin, both during and after construction, and for the gross particle separator after construction.

8. Mulch mats (erosion control blanket) may need to be placed on the hill around the parking area to help stabilize it. This will be especially important since some of this slope will be receiving sheet runoff from the parking areas.

9. Some temporary and additional E&S controls may need to be added in the field as the project commences. One recommendation would be the use of earthen berms to direct sheet flow to sedimentation basins.

Coastal Permit Requirements and Stormwater Runoff

The following comments are based on two site inspections (3/28/96 and 4/2/96) and site plans received by the DEP-LIS Office through 4/3/96. These comments pertain to coastal permit requirements and impacts of stormwater runoff to tidal wetlands.

• Coastal Permit Requirements

A determination regarding the requirement for authorization pursuant to the Structures, Dredging and Fill statutes can not be made with the available information. Such a determination requires that the location of the high tide line be shown on plan drawings. Activity waterward of the high tide line, or activity that would change the location of the high tide line (e.g., by removal of topographical barriers between the inland wetlands and the salt marsh) would require authorization pursuant to the above-referenced statutes.

Although the tidal wetland flagging appears to be generally adequate in most areas of the site, **a final determination of the accuracy of the tidal wetland delineation cannot be provided in absence of plans showing tidal bathymetry (i.e., high tide line).** Further, it was determined during the March 28, 1996 site visit that the flagged inland wetlands/tidal wetlands boundary in the vicinity of the proposed wetland creation was incorrectly depicted on the plan drawings. As a result, the created pond as presently designed extends into tidal wetlands. Such work, which may also result in an expansion of the existing tidal wetlands into the created wetland area, would require authorization pursuant to the Tidal Wetlands Act.

The one-year frequency tidal flood elevation in the Old Saybrook area of Long Island Sound is 4.3' NGVD, and is used by the DEP-LIS office as a best approximation of the high tide line in the absence of site-specific information. Although the site is considerably upstream from Long Island Sound, it cannot be assumed that tidal elevations are lower than in the Sound; in many case, high tide elevations increase in upstream areas. In a tidal study for an unrelated project, spring high tide elevations downstream of the Elm Street bridge (upstream of the TMC site) were found to be higher than the predicted high tide elevations for Long Island Sound on the same dates. For this and a number of other reasons, NOAA tide prediction tables result in an underestimate of high tide. Additionally, since *predicted* high tides in Long Island Sound on the dates of the aforementioned study were several inches below the highest predicted tides, the Elm Street high water measurements of 3.8' NGVD (and 3.9' following a rainfall event) are actually several inches below the elevation of the highest tides. **For**

these reasons, the one year frequency tidal flood elevation of 4.3' NGVD, which was also used for the nearby culvert reconstruction under the Boston Post Road, is a good estimate of the high tide elevation and local extreme high water at this site.

While the delineation of tidal wetlands strongly depends on the distribution of vegetation, the elevation component of that delineation is particularly important at this site, due to the recent enlargement of the culvert that connects the tidal wetlands at this site to the Oyster River. This is because the increased tidal flushing that is likely to result from that culvert replacement has not yet had its influence on the vegetation distribution at the site. Tidal wetlands vegetation can be expected to return to areas that it inhabited prior to constriction of tidal flow by the undersized culvert.

The intersection of the delineated tidal wetlands boundary and the norther property line appears to be 25 to 30 feet west of its location on the DEP Tidal Wetland Map (drawing No. 47-1-2), resulting in an underestimate of the extent of tidal wetlands in this section of the site. Since the Tidal Wetlands Act regulates all tidal wetlands previously mapped by DEP in addition to any subsequently delineated tidal wetlands, plan drawings should be revised appropriately. The importance of this revision is underscored by the potential for recolonization of border areas by tidal wetland plants as a result of the culvert replacement (discussed above).

• Stormwater Impacts to Tidal Wetlands

If the proposal is revised to eliminate activities proposed within delineated tidal wetlands, there remains a potential for impacts to tidal wetlands from the dilution of saline tidal waters by increased stormwater runoff. This concern is separate and distinct from issues of water quality renovation. Dilution of salinity through increased runoff volumes typically causes degradation and/or replacement of native salt marsh vegetation through expansion of existing peripheral populations of *Phragmites australis* (common reed). Dilution impacts are considered to be adequately minimized if the first inch of each rainfall event during the growing season is **retained** on site and prevented from entering tidal wetlands. Such retention can be accomplished through the use of Best Management Practices (BMP's; e.g., infiltration, swales, evaporation, etc.).

Roughly 31% of the existing pervious upland will be converted to impervious surface; the wetlands creation will result in a 10% increase in total wetland acreage on the site. The available hydrological analysis indicates that a "slight increase in run-off" will occur during 2 year and 25 year storms. On an undeveloped site, however, a typical 1" summer rain event can be expected to be retained within the top few inches of topsoil, with a majority of this either evaporating or being taken up by plants before entering groundwater or adjacent wetlands. The impact of the proposed increase in impervious

surfaces on salinity levels in tidal wetlands is potentially significant. The hydrology report also characterizes the wetland pond and renovated wetland area as stormwater detention areas. The report states that "No detention is proposed due to proximity to tidal area which will control flood elevations and flows downstream." Although it clearly is not intended to address the more frequent summer rainfall events, this view raises concerns that 1) dilution impacts to the salt marsh have not been considered, and 2) the stormwater controls have been designed to detain rather retain stormwater within the non-tidal portions of the site. This implied reliance on tidal wetlands for stormwater mitigation is generally unacceptable, especially in those cases where alternative measures to eliminate or minimize increases in runoff to the tidal wetland have not been fully evaluated. An analysis of the degree to which the project plan meets the suggested 1" retention described above and the use of additional retention BMP's if appropriate would help to address these concerns.

Coastal Resource and Planning Issues

The following comments are based on a site visit (3/28/96) and site plans and materials received through 4/3/96.

Coastal resources identified on this site include tidal wetlands, freshwater wetlands, shorelands and areas of coastal flood hazard with projected stillwater flooding to 10 feet NGVD in a 100 year storm event. Of the site's wetland resources, 4,170 sf. are proposed to be filled. The applicant also intends to restore 12,000 sf. of inland wetlands and to create an additional 16,500 sf. of inland wetland in the form of a shallow marsh and a deep water pond.

• Wetland Concerns

Wetland resources on the property include both tidal and freshwater systems. The applicant proposed to fill 4,170 sf. of inland wetland to construct a portion of the proposed building, to provide vehicular access around the structure, and to provide parking. To mitigate these impacts, the applicant is proposing the creation of a pond system and the "restoration" of adjacent freshwater wetlands. The proposed marsh and pond system would also provide stormwater detention and fill material for upland construction.

The created wetland system raises several critical questions. First and foremost, the proposed work is predicated on the assumption that the area is substantially degraded and therefore in need of "restoring." Given the significance and magnitude of this work, however, more information should be provided regarding the past history and current characteristics of the marsh. Application materials state that portions of the site's wetlands were disturbed in the early 1980's, but it is unclear which areas were affected, in what way and to what extent. While field inspection revealed that portions of the area have been altered, further information regarding the existing flora and fauna within the wetland and an assessment of how the habitat is functioning is needed for evaluation prior to any approvals to fill and excavate portions of the marsh.

This information is also critical to determine state versus municipal inland wetland authority. Freshwater wetlands are statutorily defined by soil type and are regulated by local wetland commissions while state-regulated tidal wetlands are identified through the interplay of three criteria: elevation, vegetation, and tidal inundation. Given its proximity to known tidal wetlands and low elevation, the western inland wetland area proposed for restoration should be mapped by vegetation and evaluated in light of the statutory criteria for tidal wetlands in CGS section 22a-29(2) to ensure that

the area is not, in fact, a tidal wetland system.

In addition, from our site inspection with the consultants for the applicant, including wetland consultant and soil scientist Richard Snarski, the intended delineation between inland and tidal wetland resources as flagged in the field was determined to be actually farther east than is depicted on the site plans. As a result of this error, a portion of the proposed shallow and deep water marsh work would be within state regulated tidal wetland resources, necessitating a state Tidal Wetlands permit per CGS, section 22a-32 prior to construction. Project plans should be corrected to accurately delineate between tidal and inland wetland regulatory areas and the marsh excavation work should be moved east of tidal wetland resources.

The proposed amount of wetland disturbance also appears questionable. At a minimum, the applicant should provide written justification of the need for such extensive alterations to the site's wetlands. Limiting the proposed work to the creation of a wetlands pond from the upland without further marsh disturbance may be more appropriate and should be explored. It is also strongly recommended that any work in inland wetlands or upland areas be set back from tidal wetlands in order to preserve the natural functions of the tidal marsh and prevent its despoliation and destruction. Significant work within the western inland wetland area immediately adjacent to tidal wetland vegetation, including the construction of a temporary haul road and the use of an excavator to remove fill and wetland vegetation, is not advised. Given the proximity of tidal wetland resources and the existing elevations, it is unlikely that the proposed construction work could be accomplished without disturbing tidal areas. A buffer of at least 25 feet should be considered between the proposed excavation work and the existing tidal wetlands. To assist in evaluating this matter, a site plan showing a cross-section of the proposed marsh work in relation to existing resources and tidal data should be provided for municipal review.

• Coastal Permit Requirements

Even if the proposed wetland mitigation work is moved out of state tidal wetlands regulatory jurisdiction, it appears that a state structures permit will be required prior to construction for portions of the marsh pond and upland site work. The western inland wetland area on the site plan appears to be alternately at, below, or slightly above the estimated high tide elevation. State Department of Environmental Protection regulatory jurisdiction under the Structures, Dredging and Fill Act extends to the "... intersection of the land with the water's surface at the maximum height reached by a rising tide" (CGS, section 22a-359(c)). The placement of structures or fill waterward of this high tide elevation are regulated activities subject to state review and approval prior to construction. The estimated high tide elevation for this vicinity, based upon the 1988 one year frequency tidal flood data

provided by the Army Corps of Engineers, is approximately 4.3 feet NGVD. Lacking more site specific tidal data, topographic contours and spot elevations shown on the Grading and Sedimentation and Erosion Control plan revised through 2/20/96 indicate excavation work for the proposed marsh pond and portions of the site grading and filling on the southwest corner of the site are below the estimated high tide elevation of 4.3 feet, necessitating state permit authorization.

The state's regulatory jurisdiction under the Structures, Dredging and Fill Act to require a permit for work below the elevation of the high tide should not be confused with state regulatory jurisdiction within tidal wetlands under the Tidal Wetlands Act, CGS section 22a-28 -35. Regardless of whether the wetlands exhibit inland wetland characteristics, if the work is performed in tidal waters below the elevation of the high tide, it will require a state permit prior to construction.

In addition, it appears from the project plans that the proposed marsh and pond, if constructed as proposed, may allow tidal waters to enter much farther into the southeast portion of the site. The pond's high water elevation is proposed to be 3.8 feet NGVD. It is likely, therefore, that over time, the new inland wetland pond may demonstrate tidal wetland characteristics and could be regulated as a tidal wetland in the future.

Prior to municipal approvals, site plans should be revised to clearly show the elevation of the high tide in relation to proposed development. The provision of elevation data for the southwest corner of the proposed structure is particularly important as well as additional spot elevations within the proposed marsh and pond area. Again, a cross-section of the proposed pond and its connection with the edge of tidal wetlands, with tidal elevations clearly shown, would be extremely helpful. The applicant should be aware that the creation of new land by filling coastal waters or wetlands is unlikely to receive state authorization.

• Site Planning

From a coastal planning perspective, the proposed development's proximity and impact to wetland resources raise concern. The proposal will require filling and excavation of wetlands, the significant steepening of slopes adjacent to those wetland resources, and development within 50 feet of the marsh to accommodate the desired square footage floor space and the required parking.

The proposed parking lot configuration in the northwest corner of the development is of particular concern. Project plans show the steepening of the embankment immediately adjacent to the flagged tidal wetland border and the reconfiguration of slopes to channel runoff directly into the marsh. To avoid adverse impacts to the tidal wetland both during and after construction, it is recommended that

the parking area be set back from the wetland edge 50 feet, in keeping with the tidal wetland setback requirement for buildings and other structures found in the municipal zoning regulations. Stormwater runoff should be pretreated prior to discharge, as discussed in the stormwater section below.

One of the primary legislative goals of the Connecticut Coastal Management Act (CCMA) is "To insure that the development, preservation or use of the land and water resources of the coastal area proceeds in a manner consistent with the capability of the land and water resources to support development, preservation or use without significantly disrupting either the natural environment or sound economic growth" (CGS, section 22a-92(1)). Maintaining existing slopes and providing a vegetated setback between development of the proposed parking lot and the wetland would minimize potential adverse impacts on water quality and riparian habitat areas. This could be accomplished through a reduction in the proposed square footage of the building which would limit the required parking or by reconfiguring the site plan to shift development away from the wetland edge.

- **Stormwater**

The proposed treatment of stormwater raises additional considerations. The CCMA requires that activities within the coastal boundary minimize potential degradation of coastal water quality caused through the significant introduction into coastal waters of suspended solids, nutrients, toxins, heavy metals or pathogens, or through the significant alteration of temperature, pH, dissolved oxygen or salinity (CGS, section 22a-93(15)(A)).

Stormwater runoff should be retained on-site to the extent practicable or pretreated prior to discharge into coastal waters. It is recommended that pretreatment measures address at least the first inch of runoff during a projected 25 year storm event to ensure that runoff carrying the majority of pollutants is renovated prior to its entry into coastal waters. Providing a vegetated buffer from wetland resources can assist in cleansing stormwater pollutants as well as in slowing the rate of stormwater runoff, thereby increasing infiltration and minimizing erosion.

Application materials indicate that the majority of stormwater collected on the site will be discharged to a siltation basin before being allowed to pass into inland wetlands and subsequently to tidal wetlands. Catch basins centered in the parking lot will discharge stormwater first to a gross particle separator which will discharge waters into a sedimentation basin and subsequently over a berm and into the wetlands. While such measures can provide pretreatment of runoff prior to discharge to coastal waters, it is unclear whether portions of the system and its construction may be below the high tide elevation, necessitating a state permit and calling into question the efficacy of such a system. The high tide elevation should be depicted on the plans and all portions of the proposed sedimentation basin moved

landward of tidal influence.

In addition, increases in the volume of freshwater into the marsh could adversely affect restoration efforts or cause degradation along the tidal fringe, resulting in the expansion of *Phragmites australis* (common reed). Diminished tidal flushing to the marsh from the construction of Route 1 was recognized and addressed in 1994 when the State Department of Transportation replaced the Route 1 culvert linking the marshes south of the road with the Oyster River. Located 600 feet east of the intersection of U.S. Route 1 (Boston Post Road) and Old Boston Post Road and shown in the far northwest corner of the site plans, the Route 1 culvert provides tidal flushing to the wetlands south of the road, including those on the subject property. The deteriorating 48" culvert was replaced with a larger, elliptical 71" x 47" pipe specifically to increase flushing and restore degraded wetlands. Accordingly, the site design should be modified to eliminate sheet flow of runoff from the northwest corner of the parking lot directly into tidal wetlands. Further, to enable the drainage system to work more effectively and to minimize the volume of freshwater discharged to the tidal wetland, runoff from the roof should be separated from parking lot drainage and directed into the ground through the use of infiltration, if soil conditions allow.

• Subsurface Sewage Disposal

Given the necessity for blasting and the proximity of sensitive resource areas, the placement, design, and construction of the sewage disposal system will require careful consideration to avoid potential adverse water quality impacts to both surface and groundwater supplies. The proposed system should not only meet all necessary health code requirements but be located so as to minimize potential adverse impacts on coastal resources. Tidal wetlands, areas of coastal flood hazard, and the elevation of the high tide line in proximity to the proposed system should be clearly shown on the design plans. As a general rule of thumb, subsurface waste should have a minimum underground travel distance of 50 feet before reaching areas of environmental concern. Longer distances, however, may be necessary in areas of fractured bedrock, which may be applicable here following blasting activities. *(Editor' Note: Please also refer to Appendix A: Report from the CT Department of Public Health on the proposed subsurface sewage disposal system.)*

• Recommendations

Although the proposed retail use is consistent with surrounding commercial activity and may be appropriate if properly buffered from adjacent residential properties, the size of the proposed development and its configuration on the property should be revised to minimize potential adverse impacts to coastal resources. As proposed, the square footage and placement of building necessitates the filling of over 4,000 sf. of wetland and the extension of filling and grading activities to the edge of

wetland resources to provide adequate parking. Proposed mitigation measures to construct a shallow and deep water marsh and pond system raise significant questions, highlighting the need for supplementary resource information. Specifically,

(1) information regarding the high tide elevation and its relationship to the proposed development should be shown on project plans,
(2) the wetlands need to be surveyed by vegetation type and a biological assessment provided on the value and functions of the wetland areas proposed for "restoration," and
(3) additional justification for the size of the proposed marsh work and the necessity to do work immediately adjacent to the tidal/inland wetland boundary should be provided.

As currently drawn on project plans, portions of the development appear to require both state tidal wetlands and coastal structures permits since work is proposed below the estimated high tide elevation of 4.3 feet NGVD and the edge of tidal wetlands west of the western inland wetland area was apparently incorrectly depicted on the project plans. A cross-sectional drawing depicting the proposed pond system should be included with tidal elevations and adjacent coastal resources clearly shown.

To minimize potential adverse impacts on coastal water quality and adjacent wetland resources, the stormwater management proposed should

(1) be modified to infiltrate runoff to the extent practicable,
(2) avoid discharge to tidal wetlands, and
(3) pretreat at least the first inch of remaining runoff prior to discharge into coastal resources.

Inland Wetland Review

• Existing Conditions

Inland wetlands on this property consist of two separate parcels. As mapped by the applicant's soil scientist, there is an approximately 0.4 acre parcel at the upper end of the coastal-tidal wetlands located on the eastern portion of the property, and an approximately 0.5 acre parcel in the far western portion of the property. A more precise area measurement is not possible for two reasons. First, the size of the eastern inland wetland should at this time be considered approximate due to discrepancies with the location of the tidal/freshwater boundary (refer to Office of Long Island Sound Program (OLISP) sections (Coastal Permit ... and Coastal Resources ...) for a discussion on this topic). Secondly, the wetland boundary for the western parcel is not complete in that wetland flags 73 and 84 do not "tie in" to anything.

The eastern inland wetland is a palustrine forested type with a disturbed surface. Portions of this parcel appear to have been worked by large, tracked vehicles creating small mounds and ruts. Judging from the age of the trees growing on the mounds, this activity appears to have taken place at least ten years ago. At the time of the ERT site visit there was standing water throughout with shallow channels throughout. Flow of this water was not detectable. Vegetation was present at herbaceous, shrub and tree layers creating a rather diverse assemblage of plants. A small stand of *Phragmites* (Common reed) was present at the freshwater/tidal boundary The western inland wetland is palustrine scrub/shrub type with no discernable surface inlet or outlet.

• Wetland Functional Values

Since there are no proposed impacts for the western inland wetland, this section will pertain only to the eastern inland wetland. The primary functional values for this inland wetland include wildlife habitat, floodwater storage and excess nutrient/pollutant attenuation. Given the diversity of vegetation within the wetland, the mature upland forest to the south of the wetland, its proximity to coastal-tidal wetlands, and its relative seclusion, there is good reason to believe that this wetland should be highly valued as wildlife habitat. As an appendage to the coastal-tidal wetland, this inland wetland would provide additional storage area for flood waters originating in the coastal-tidal wetland. Its location within the "Flood Hazard Area" (essentially a 100-year return frequency flood level) further attests to this function. Its position in an urbanized, developing landscape with existing and very potential urban stormwater quality concerns, as well as its ability to slowly transmit surface water through highly variable surface topography, should also give this wetland a better than average value to its natural ability to remove certain pollutants from stormwater runoff flowing into it.

In addition, this inland wetland is noteworthy due to its direct association with coastal-tidal wetland in that it serves to diversify its functional values with its freshwater wetland characteristics and, with the benefit of additional information, may even be considered a "freshwater-tidal wetland", considered a "critical habitat" within Wetlands of Special Concern in Connecticut (1988), prepared by CT-DEP's Natural Resource Center.

• Proposed Activities and Possible Impacts

According to the Team inland wetland specialist's calculations, the applicant proposes direct inland wetland impacts of approximately 0.3 acres. This impact results from the proposed placement of fill material within the eastern inland wetland for the purpose of building construction, parking lot construction and associated grading activities (0.1 acres) as well as marsh construction (0.2 acres). The application submitted to the Old Saybrook Inland Wetland Commission (OSIWC)indicates under "Total area of wetlands to be altered..." an area of only .09 acres. The Team inland wetland specialist assumes that this area calculation pertains only to the filling activities and not the marsh construction which should also be considered an "alteration." Possible indirect impacts on inland wetlands include reduced water quality due to stormwater inputs to the wetland via the proposed stormwater management system as well as possible negative impacts to wildlife as a result of placement of fill material within the eastern inland wetland buffer area for the purpose of building construction, parking lot construction and associated grading activities construction.

The applicant proposes to mitigate these impacts through on-site wetland "restoration" and wetland creation projects as well as the use of a gross particle separator and "wetland sedimentation basin."

• Discussion and Recommendations

In considering an application involving regulated impacts to wetland areas, the OSIWC should ensure that the applicant has taken all reasonable steps to first avoid and then minimize impacts to inland wetland areas. In the case of an application which receives a public hearing, as this one has, the OSIWC must find that a feasible and prudent alternative to the proposed wetland alteration does not exist prior to issuing a wetlands permit. Once the least environmentally damaging alternative has been achieved and areas of wetland impact are still necessary and approvable by the OSIWC, only then should wetland restoration or creation be considered to mitigate for unavoidable wetland impacts. In addition, this compensation should be undertaken with the goal of replacing those wetland functional values lost as a result of those unavoidable impacts.

In light of this rationale, and the above discussion of the functional values of the inland wetland which would be directly impacted as a result of this proposal, it is recommended that other feasible and

prudent alternatives should be considered for the development of this which would further avoid direct wetland impacts. In addition, it is further recommended that a wetland buffer of sufficient width be maintained around the wetland to aid in avoiding indirect wetland impacts as well.

Within the inland wetlands application (Attachment I), that portion of the eastern wetland for which the marsh creation is proposed is described as "despoiled" and the marsh creation process as "rehabilitation." This wetland area where earth moving and rutting has occurred is not pristine, however, it appears that the hydrologic inputs to the wetland have not been significantly altered and the area is re-vegetating very well. Based on its current condition, there appears to be no overriding need to restore or "rehabilitate" this wetland and that its functional value as described above, is sufficient to afford a certain level of protection.

Of course, any wetland creation in upland areas of the parcel is encouraged and could serve to treat collected stormwater prior to it flowing into the existing wetland.

Additional suggestions are as follows:

- The Construction Sequence for "Creation of Marsh and Pond" on sheet 2 of 2 should include stipulations for a monitoring period of at least three years wherein occasional visits will be made by a professional wetland scientist, proficient in hydrology and plant science, to determine the success of the project and supervise remedial work if it is judged necessary.

- The wetlands boundary statement on sheet 1 of 2 should be signed prior to permit determination.

- The gross particle separator and the sediment basin should be designed according to certain specific water quality objectives (ie. storm frequency, sediment volume capacity, storm runoff depth storage etc.) There is no evidence that this has been done.

- The erosion & sedimentation plan should include the mention of:

  1) temporary erosion protection when time of year or weather prohibit establishment of permanent vegetative cover,

  2) planned temporary vegetation if disturbed areas are to remain for thirty (30) days or more,

3) maintenance requirements for permanent measures (ie. sediment basin, gross particle separator) after the construction period including the name and phone number of the person responsible for this maintenance.

Fisheries Resources

Tidal Wetlands and Oyster River

Fisheries resources on the project site are restricted to the salt marsh (*Spartina* marsh) and the small tidal channels associated with it. While no construction activities are proposed within this area, clearing and grading limits extend up to the edge of approximately 90 linear feet of tidal wetlands adjacent to the northwest portion of the parking area. This marsh system is hydrologically connected to the Oyster River, the largest tidal river system in the town of Old Saybrook, exclusive of the Connecticut River.

The Oyster River undoubtedly supports a diverse finfish community. However, there is no documented fisheries resource information from this river system to the knowledge of the Team fisheries biologist. Without such information, one can only speculate as to which finfish species may actually utilize the tidal creeks and salt marsh on the project site. Species that are year-round residents of such habitat's in southern New England include mummichog (*Fundulus heteroclitus*), striped killifish (*Fundulus majalis*), sheepshead minnow (*Cyprinodon variegatus*), Atlantic silverside (*Menidia menidia*) and fourspine stickleback (*Apeltes quadracus*) (Teal 1986). All of these fishes are common in Connecticut (Thompson et al. 1978) and would be likely inhabitants of this salt marsh system. All are small fishes that serve an important ecological role as food for fish eating birds and fishes. Other species that likely utilize the Oyster River, but that probably do not occur within the project site with any regularity, include alewife (*Alosa pseudoharengus*) an anadromous species (spawns in fresh water but matures in marine waters) and bluefish (*Pomatomus saltatrix*) and striped bass (*Morone saxatilis*), both of which are marine predators that would enter the river for purposes of feeding. American eel (*Anquilla rostrata*), a catadromous species (spawns in the ocean but matures in freshwater or estuarine waters) would also be expected in the Oyster River and small tidal channels on the project site. As was noted earlier, the Oyster River is probably utilized by a variety of marine and estuarine fishes that are not listed here.

Inland Wetlands System and Marsh/Pond Creation

The inland wetlands on the site currently do not provide habitat capable of supporting fish. Part of this development proposal includes the creation of a freshwater marsh that will encircle a 7,500 sf. (0.17 acre) freshwater pond. This wetland system is being created to offset the loss of 4,170 sf. of inland wetlands that will be filled in accordance with the current site plan. Part of the created marsh system will result from the alteration (enhancement) of existing wetlands (12,000 sf.), whereas the remainder

of the marsh system and all of the pond will be created from upland areas (16,500 sf.). Numerically, the site will realize a net increase of 12,300 sq. of inland wetlands. Total on site wetlands (tidal and inland) currently comprises 25% (2.25 acres) of the project site (9.72 acres), and this will be increased to 28% (2.73 acres) of the site.

The pond/marsh system construction plan should result in a diverse and viable freshwater marsh/shallow pond habitat. Although it is not detailed in the plan, the Team's fisheries biologist concurs with the proposal to strategically place stumps and boulders in shallow portions of the pond to increase habitat diversity.

The created pond will have a maximum depth of 5.8 feet during high water periods (high water elevation = 3.8 feet; maximum depth at elevation -2). The expected extent of seasonal water fluctuations in the proposed pond has not been described. Fluctuating water levels can be deleterious to warmwater pond fish communities (Murphy and Mysling 1993). Even if significant reductions in pond depth are not expected to occur in this pond during the summer low water period, the pond's habitat value for fish would be improved by increasing its maximum depth by two to three feet. Murphy and Mysling (1993) advocate a maximum depth of 10 feet for warmwater ponds.

Fish Stocking Suggestions

The site plan does not discuss the stocking of the pond with fish. While it is expected that amphibians and reptiles will naturally colonize the marsh and pond system from surrounding areas, fish will not be able to do so and must therefore be stocked. In keeping with the spirit of restoring and enhancing the functional value and ecological integrity of this inland wetland system, it is recommended to stock the pond with native freshwater species. The following native species, which are expected to establish reproducing populations in vegetated warmwater habitats, are all available from commercial hatcheries: golden shiner (*Notemigonus crysoleucas*), pumpkinseed (*Lepomis gibbosus*) and chain pickerel (*Esox niger*). Brown bullhead (*Ameiurus nebulosis*) could also be considered, although the small size of the pond effectively limits the number of fish than can be supported in it. Largemouth bass (*Micropterus salmoides*) and bluegill (*Lepomis macrochirus*) are among the most common species in Connecticut lakes and ponds (Whitworth 1996), and they are often stocked by small pond owners for recreational fishing purposes (Murphy and Mysling 1993). However, since these species are not native to Connecticut, they were not recommended in the above list.

Golden Shiner are minnows that need aquatic vegetation to spawn successfully. Chain pickerel are predators that also spawn on aquatic vegetation, primarily in shallow areas. Pumpkinseeds, like all

members of the sunfish family (which includes largemouth bass and bluegill), spawn by creating depressions in the pond bottom into which their eggs are deposited and then guarded. Brown bullhead are also bottom spawners and they spawn within small depressions they create in the pond bottom, often in association with stumps or boulders. Although commercial availability is questionable, redfin pickerel (*Esox americanus americanus*) are native pickerel that may be better suited for this pond than chain pickerel since they grow to lengths of only about 13 inches are are more typically found in smaller water bodies (Smith 1985, Whitworth 1996).

Fish cannot be legally stocked into Connecticut waters without first obtaining a Fish Liberation Permit. Permits, commercial hatchery lists and other relevant information can be obtained from the DEP Fisheries Division, 79 Elm Street, Hartford, CT 06106 (tel. 860-424-FISH).

If this proposal moves forward, Fisheries Division staff can assist the pond owner in fine tuning a stocking plan (appropriate number of each species) once the pond and marsh system has been established.

Literature Cited

Murphy, B. and D. Mysling. 1993. Small Ponds in Connecticut - A Guide for Fish Management. Connecticut Department of Environmental Protection. Hartford, Connecticut. 81 pp.

Smith, C.L. 1985. The inland fishes of New York State. The New York State Department of Environmental Conservation. Albany, New York. 522 pp.

Teal, J.M. 1986. The ecology of regularly flooded salt marshes of New England: a community profile. U.S. Fish Wildl. Serv. Biol. Rep. 85(7.4) 61 pp.

Thomson, K.S., W.H. Weed III, A.G. Taruski, and D.E. Simak. 1978. Saltwater fishes of Connecticut. State Geol. and Nat. Hist. Survey of CT. Bull. No. 105. Hartford, Connecticut. 186 pp.

Whitworth, W.R. 1996. Freshwater fishes of Connecticut. Connecticut Geologic and Natural History Survey Bulletin No. 114. Hartford, Connecticut. 240 pp.

Planning Review

The following list represents concerns that remain following the presentation of the TMC Associates L.P. Retail Development application to the Zoning Commission on 3/18/96 and following the engineer's presentation of the plans to the ERT on 4/2/96.

• Wetland System

Following the site visit and presentations, some concern still remains (although not quite as urgent) over the specific location of the inland wetland/tidal wetland boundary. The applicant's soil scientist described where he thought there was a discrepancy between the boundary as it exists in the field and the boundary as it has been shown on submitted plans. The applicant should provide a definitive determination of the tidal/inland wetlands boundaries, especially in areas where development comes within close proximity of the sensitive resources.

1. Additional Elevation Presentation - additional detailed spot elevations that have apparently been recently acquired by the applicant's engineer should be made available in order to rule out the possibility that proposed development activities are to be conducted within tidal wetlands (Section 22a-28 through 22a-35 CGS, inclusive) or waterward of the high tide line (Section 22a-359 c. CGS).

2. Technical Back-up Presented Delineation - if concern over the delineation methodology still exists, the applicant should be requested too present a certified boundary delineation of the inland/tidal wetland boundary.

• Site Preparation

Concern is raided over the lack of information presented with regard to site preparation. The applicant should provide a specific methodology for site preparation, including:

1. Specific Identification of Construction Methodologies for Ledge/Bedrock Removal - volume of bedrock and ledge to be excavated, volume of bedrock and ledge to be blasted, volume to be used as fill, crushing methodology with times of expected operation (days of the week, time of daily commencement and completion) and whether or not additional fill materials will be brought to the site or excess material will be removed from the site.

2. Identification of Tidal Wetland and Buffer for Construction Personnel - specific methodology for slope construction and filling in the area of the tidal wetland at the northwest corner of the site. The applicant should be required to place two sets of closely spaced, easily seen field flags in sensitive areas prior to site work as follows:

- a line of markers at the wetland boundary (a *"No-Cross"* line);
- a second line of flags marking a 10 to 15 foot setback from the wetland past which no

equipment is to pass under any circumstances.

3. Protection of Wetland During Placement of Fill - in the event that a bulldozer, front end loader, backhoe or any other heavy equipment is to be used to place fill at the northwestern edge of the proposed parking lot, the applicant should be required to specify how fill material will be prevented from rolling down the constructed slope and into the wetland, even in the event that a setback is imposed. At the present, only *a single silt fence* is proposed at the boundary of the wetland between Wetland Flags #7 through #11. This would be especially critical if fill material will include large blocks of uncrushed ledge or bedrock. The applicant should specify what measures will be used to insure that adverse impacts to sensitive resources will not occur. It should be recommended that this provision be included as a specific condition of any approval.

• Flood Storage Impacts

The applicant should provide specific data indicating whether flood storage capacity will be impacted positively or negatively as a result of this development. Specifically, data should indicate *on a one-to-one volume basis* whether flood storage capacity will be increased or decreased as a result of the proposed development. The applicant's engineer, in relating the proposed excavation and fill to the Oyster River basin and Long Island Sound, neglects to take into account the impacts of increased upland storm drainage from a heavy rain during a rising Spring tide. Under these circumstances, the tidal head on the Route 1 culvert combined with additional upland storm water flow from the developed lot may create adverse and unknown flooding impacts on adjacent properties. With no engineering review, it is unknown whether or not adverse flooding impacts are indeed a concern. The applicant should be required to demonstrate that adjacent properties and roads will not suffer any adverse impacts from flooding.

• Pedestrian/Vehicular Circulation

The applicant should be requested to provide a sidewalk on the south side of the western end of the front parking lot. The new sidewalk should be connected to the proposed sidewalk in front of the proposed building by a pedestrian crosswalk with appropriate signage painted on the driveway connecting the two sidewalks. If employee parking is designated in the rear of the building as suggested by the applicant's engineer, the applicant should be requested to provide an additional sidewalk to direct those employees away from the truck maneuvering area. An additional crosswalk may be appropriate in this area as well.

• Truck Circulation

Although the applicant states that the site incorporates *"... proper geometry for a WB-50 vehicle, a tractor trailer, based on American Association of State Highway Official Standards ..."*, it seems

unlikely that a tractor trailer would be able to maneuver into the loading dock area and reverse directions in order to access the loading docks once in the rear of the proposed building. It seems unfeasible that a truck could access the loading docks by, first, pulling into the southeastern-most corner of the rear parking and then, second, backing up while sharply turning the vehicle in order to place the rear end of the trailer at the dock. The presence of designated employee parking in this area will only further congest the area and likely make that maneuver virtually impossible.

Unless the applicant can demonstrate that truck circulation is feasible to the rear of the building, it seems that there is no alternative but to request that this plan deficiency be corrected by redesigning the truck delivery area so trucks can enter, turn around, back into the docks, and leave the site the way they entered. Additional site space, however, shouldn't be created by expanding proposed fill areas and risking additional impacts to natural resources. Alternatives seem to include either the reorientation of the building, downsizing the building (and required parking space and landscaping), or relief from parking and/or landscaping requirements through variance (this only after withdrawal of the present application).

- **Drainage**

The applicant should be requested to either eliminate the impacts of stormwater drainage on natural resources as much as possible by directing 100% of upland storm water through catch basins (equipped with sediment, oil and grease separators) and an enlarged or additional settling basin, or demonstrate why the remaining adverse impacts of surface drainage from parking lot areas directly to the wetland system should be acceptable, consistent with the Connecticut Coastal Management Act.

- **Sedimentation and Erosion Control**

The applicant should be requested to change Note #9, Construction Detail Plan, Sheet 2 of 2, Sedimentation and Erosion Control Measures, to ***"Inspection shall be made at least once a week and within 24 hours after each significant rainfall event".***

- **Conclusion**

With regard to the proposed use, the development of retail space on the subject site seems wholly consistent with the Town's Plan of Development and Zoning Regulations. In addition, the efforts of the applicant to propose the rehabilitation of degraded wetlands on this site should be seen as a positive step.

Based upon the review of the plans to construct 34,300 square feet of retail space at the subject location, however, one can't help but get the sense that the applicant has maximized development of this portion of the site, squeezing more development on the upland than can reasonably be

accommodated within the context of a well designed plan. Specifically, it does not seem that sufficient space has been left on the site to adequately address truck circulation. Additionally, the building footprint and the parking and landscaping area required by that footprint has dictated that upland development come alarmingly close to sensitive natural resources.

Ideally, it seems that the downsizing of the building and the parking/landscaping areas requirements, the separation of upland development from the wetland areas, and opening up of the upland site for additional vehicular circulation would be vast improvements here. Treatment of 100% of the upland stormwater flow would add to the quality of the design. Unfortunately, it is unclear whether or not the economics of this site will allow the applicant to improve the plan as suggested.

Appendix A

STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH

April 4, 1996

Don Lucas, P.E., RS
Building & Environmental Health Officer
Town of Old Saybrook
302 Main Street
Old Saybrook, CT 06475-1741

Re: Approval of Plans For TMC Associates, LP,
1000 Boston Post Road, Old Saybrook

Dear ~~Mr. Lucas~~ DON:

We have reviewed plans for the installation of a subsurface sewage disposal system for TMC Associates, LP, at 1000 Boston Post Road in Old Saybrook. Plans were prepared by the consulting firm of Angus McDonald/Gary Sharpe and Associates and submitted to this office for review pursuant to Section 19-13-B103d(c) of the Public Health Code. The plans bear a revision date of March 25, 1996.

These plans were found to be generally satisfactory and in accordance with the requirements of the Public Health Code. They are hereby APPROVED by this office with the following stipulations noted:

1. The two proposed septic tanks, placed in series, shall be of single compartment configuration, Mid-depth baffles shall connect the two tanks.

2. The 15" RCP storm drain shall be watertight and consist of rubber compression gasket joints. Type "C" catch basins shall also be watertight.

3. Area of Test Hole (TH) #5 may have knob of ledge less than four (4) feet below the bottom of the proposed leaching system. We suggest confirmation probes be conducted during the "stripping" operation directly below the gallery rows to verify that proper depth is provided.

4. Approval is based on documented design flows. No food services or other high water users will be allowed unless revised plans are submitted demonstrating the site can support such a usage per code.

5. Permit to Discharge shall limit water usages, per this design, to 1,000 gallons per day (GPD) average over any 90 day period and a maximum daily usage of 1,500 GPD.

Due to the past disturbances of this site, we would recommend that a professional engineer (PE) supervise the site preparation (stripping, filling, blasting, etc.) phase of construction.

Reviewing the testing information provided on the plans and analyzing groundwater monitoring data, the proposed sewage disposal design area can be divided into five sections. To the southeast and east, ledge is encountered at shallow depths; in the leaching area the naturally occurring soils are basically sands and gravels covered by various depths of miscellaneous fills (16" to 33"); in the middle section (T.H. #1, #201, #104, #203) the sand and gravels are found but the overburden of fill increases (42"-78"); to the west soil disturbances are at their maximum with tighter soils being observed in this area; to the southwest and west the soils eventually change to wetland conditions.

Groundwater elevations seem to suggest that groundwater movement is from the east and west sections converging into the middle section. This is consistent with soil conditions since ledge would be a barrier to groundwater movement to the east and the highly disturbed areas to the west would inhibit movement in that direction. Monitoring data indicates that the middle section has the lowest groundwater levels (elevation 3.9), confirming the above scenario. It is our opinion that groundwater exits this site both in a northerly and southerly direction along the axis of TH's #1, #201, #104 and #203.

We have reviewed McDonald/Sharpe Associates hydraulic analysis and concur that the leaching area and surrounding naturally occurring soils would be able to absorb and disperse the design flow of 1,500 GPD up to a maximum discharge of 3,430 GPD (maximum potential flow of 34,300 S.F. building used for retail/commercial/office use). Minimum Leaching System Spread (MLSS) calculation in this case (MLSS = 28 x (1500/300) x 1.2 = 168'; required 140' provided) would not be appropriate since the direction of groundwater movement is not confined to one direction. Once groundwater (or sewage, in this case) reaches the middle section, referred to above, it enters the highly permeable sands and gravels and moves either to the north or to the south depending on what side of the "mound" it positions itself. We would reevaluate our conclusions regarding hydraulic capacity if monitoring shows that following a significant rain event the middle section has an increase in groundwater elevation which does not fall to "normal" levels within one or two days.

The location of the proposed leaching system exceeds the minimum separation distances to the nearest watercourse, therefore the discharge should not negatively impact the tidal wetlands to the south and west.

If you have any questions, or if you feel that there should be some changes, please contact us.

Sincerely,

Arthur J. Castellazzo
Sanitary Engineer III
Environmental Engineering

donlucas.doc
c: McDonald /Sharpe Associates
P.O. Box 608
Old Saybrook, CT 06475-1502

Elaine Sych, ERT Coordinator
P.O. Box 70
Haddam, CT 06438

Appendix B

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 occurring 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 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. Consultation 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.

Thank you for consulting the Natural Diversity Data Base. 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.

Appendix C

Geology and Hydrology

The proposed development site is the northeast corner of the 9.7 acre parcel that straddles a small 20 foot high bedrock knoll bounded to the south and west by substantial wetlands.

The bedrock geology of the site is described by Lundgren in his 1964 monograph QR-15 on the Essex Quadrangle. The 1985 CT Bedrock Geology Map updates some of the rock unit names as the geological interpretation of the area has changed substantially over the years, although the rocks, of course, have not. Both maps show the entire area underlain by a light gray colored feldspar-quartz-biotite-horneblende banded gneiss interbedded with amphibolite and pink colored coarse grained granite. Lundgren refers to this rock as the Munson gneiss, more recent work has shown that the rocks are more likely correlated with rocks in the New London area and they are now considered equivalent to the "Hope River" gneisses. Whatever their correct "name" the gneisses are characterized by well defined near vertical east-west planar foliation (banding). As a result, the rock splits readily into large thick slabs. A 500 foot long abandoned quarry just east of the proposed development site evidently exploited this characteristic of the rock and must, in its day, have produced a significant quantity of building stone for local masons. Although the crest of the bedrock knoll in the area proposed for development is formed of similar rock and is directly on strike with the old quarry there is no visible evidence of any quarrying on the project site. The dominant fracture in the bedrock is parallel the foliation, a fact worth noting and being aware of should any groundwater effects be noted during or after construction. Groundwater flow in the bedrock is likely to be fastest in an east-west direction.

The Surficial Geologic Map of the Essex Quadrangle by Flint (1972, CT QR-31) shows the unconsolidated materials which blanket all but the few bedrock outcrops on the northeast knoll of the parcel to have been deposited along the edge of a retreating ice sheet roughly 15,000 years ago. Such deposits are typically a poorly sorted inhomogenous mix of water worked glacial debris. Very rapid lateral and vertical changes in grain size from fine silts to coarse gravels would be typical reflecting the confused nature of the drainage system of fluctuating amounts of meltwater flowing off the ice onto the land surface. The only materials exposed on the bedrock knoll at the time of the ERT visit were reddish brown coarse sands and gravel. Flint reports some compacted till on the site. The thickness of the overburden is probably less than 10 feet or so at the proposed foundation site and whether it is till or sand is basically irrelevant.

ABOUT THE TEAM

The Eastern Connecticut Environmental Review Team (ERT) is a group of professionals in environmental fields drawn together from a varety of federal, state and regional agencies. Specialists on the Team include geologists, biologists, foresters, soil specialists, engineers and planners. The ERT operates with state funding under the supervision of the Eastern Connecticut Resource Conservation and Development (RC&D) Area — an 86 town region.

The services of the Team are available as a public service at no cost to Connecticut towns.

PURPOSE OF THE TEAM

The Environmental Review Team is available to help towns and developers in the review of sites proposed for major land use activities. To date, the ERT has been involved in reviewing a wide range of projects including subdivisions, landfills, commercial and industrial developments, sand and gravel excavations, elderly housing, recreation/open space projects, watershed studies and resource inventories.

Reviews are conducted in the interest of providing information and analysis that will assist towns and developers in environmentally sound decision-making. This is done through identifying the natural resource base of the project site and highlighting opportunities and limitations for the proposed land use.

REQUESTING A REVIEW

Environmental reviews may be requested by the chief elected official of a municipality or the chairman of town commissions such as planning and zoning, conservation, inland wetlands, parks and recreation or economic development. Requests should be directed to the chairman of your local Soil and Water Conservation District and the ERT Coordinator. A request form should be completely filled out and should include the required materials. When this request is approved by the local Soil and Water Conservation District and the Eastern Connecticut RC&D Executive Council, the Team will undertake the review on a priority basis.

For additional information and request forms regarding the Environmental Review Team please contact the ERT Coordinator: 860-345-3977, Eastern Connecticut RC&D Area, P.O. Box 70, Haddam, Connecticut 06438.