Town Pond
Section 1135, Environmental Restoration Project
and
Coastal America Project
Portsmouth, Rhode Island

Draft
Environmental Assessment
and
Clean Water Act
Section 404(b)(1) Evaluation

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DEPARTMENT OF THE ARMY
NEW ENGLAND DISTRICT, CORPS OF ENGINEERS
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SECTION I - LOCATION AND AUTHORIZATION

LOCATION

The project site is located at the northern end of Aquidneck Island in Portsmouth, Rhode Island (Figure 1). Town Pond is connected to the tidal waters of Mount Hope Bay by an inlet through a railroad embankment.

AUTHORIZATION

The feasibility investigation for this project examines restoration of the southern portion of the former Town Pond salt marsh/salt pond under the authority of Section 1135 of the Water Resources Development Act of 1986 (PL 99-662), as amended. This document has been prepared in compliance with the National Environmental Policy Act (NEPA) and documents compliance with all applicable Federal environmental laws and regulations.

SECTION II - PURPOSE AND NEED FOR THE ACTION

In 1938, the Town Pond system measured approximately 50 acres including about 34 acres of salt marsh and 47 acres of salt pond/tidal flats. In all likelihood, the former habitat supported a community of estuarine invertebrates consisting of marine worms, snails, crabs, shrimp and shellfish. These invertebrates helped to support a community of fish and wildlife that feed on invertebrates. Fish such as winter flounder, Atlantic silversides, and mummichogs would have fed in the marsh and other shallow water habitats. The pond and marsh and the fish and invertebrates that lived in it would have provided a resting and feeding place for waterfowl such as black ducks, bufflehead, and scaup. Shorebirds, such as sandpipers and plovers would have foraged along the shoreline during low tide and wading birds such as great blue herons would have fished in the shallow water along the edge of the pond. These and other fish and wildlife would return to the site if the salt marsh and pond habitats were restored.

The purpose of this project is to restore estuarine habitat, salt marsh and associated values to fish and wildlife. In general, the goal of Corps of Engineers restoration projects is to restore *modern historic conditions*. This criterion establishes a known habitat condition as the baseline for Corps restoration projects. The modern historic condition for the Town Pond restoration project, the condition of the pond in 1938, is shown on the left side of Figure 2.

Currently, the majority of Town Pond south of the rail road embankment consists of degraded freshwater/brackish habitat. The Corps of Engineers filled the estuarine habitats with sediment when the Fall River ship channel was dredged, eliminating flooding by tidal salt water and creating a marsh dominated by common reed (*Phragmites australis* hereafter referred to as phragmites). The existing substrate elevation and limited tidal range do not allow most of the system to support the estuarine species that previously existed at the site. The present condition of the marsh is shown on the right side of Figure 2.

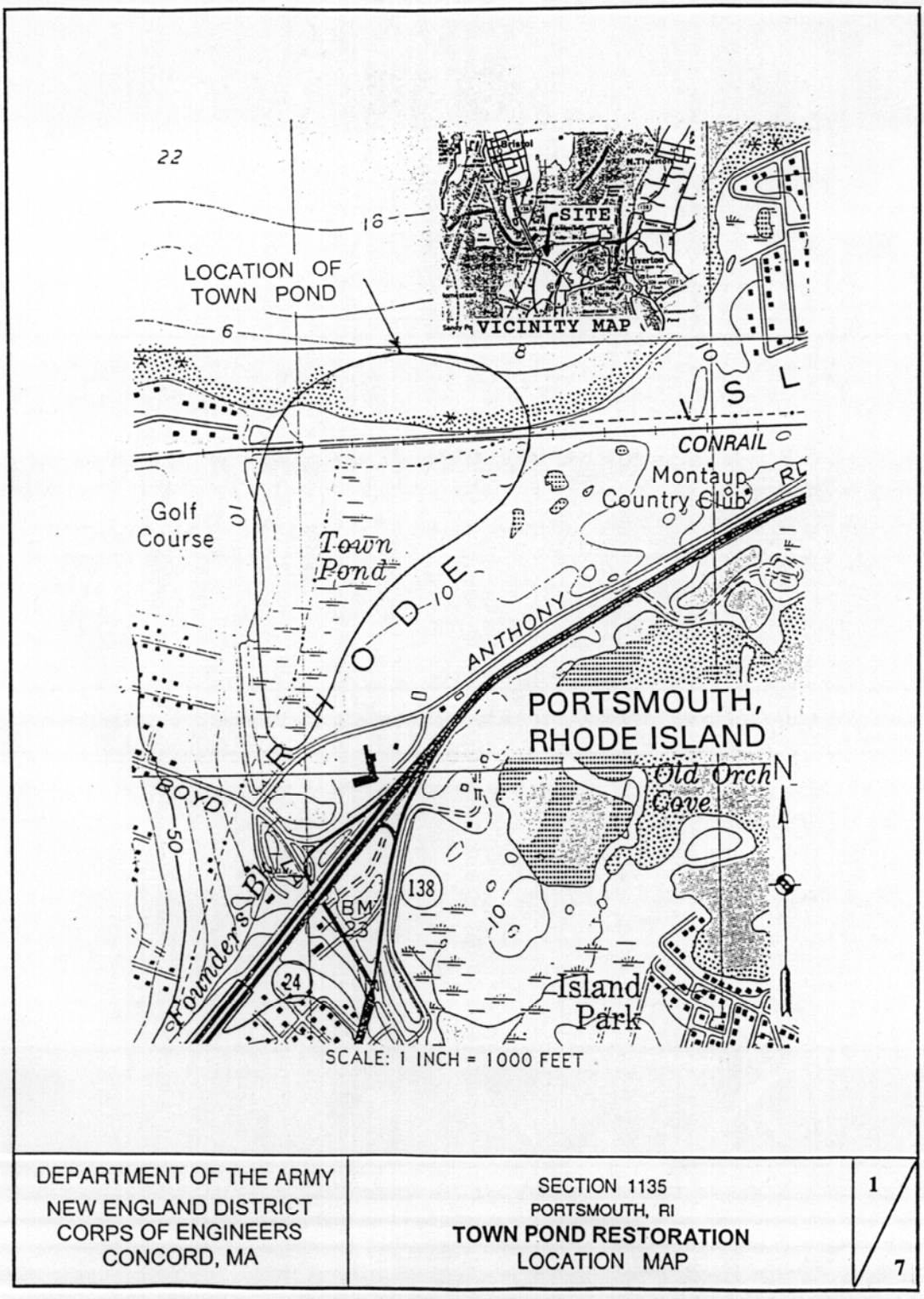


Figure 1. Project Site Location

Figure 2. Town Pond in 1938 (on left) and 1996 (on right)

Phragmites, the dominant habitat type in Town Pond, has relatively low value for fish and wildlife. It is not used by many animals as a food source and it grows in dense stands that do not allow more valuable plant species and habitat types to coexist. Phragmites also presents a potential fire hazard, makes management of mosquitoes difficult, and has a lower aesthetic value than the natural salt/salt pond system. More importantly, the habitat is no longer connected to the tidal habitats of Mount Hope Bay and Narragansett Bay, so it no longer contributes to the production of fish and wildlife such as winter flounder, killifishes, soft shelled clams and quahogs, or waterfowl and wading birds.

Restoration of normal periodic tidal flushing of the marsh with salt water would reestablish salt pond, tidal flats, and salt marsh and maintain soil water salinity levels high enough to discourage the growth of phragmites. Restoring the modern historic habitats would restore the abundant and diverse community of fish and wildlife that used the site.

SECTION III - PROPOSED PLAN

The recommended alternative for this project is described in detail in Part IV of the Project Modification Report. In general, the proposed plan involves grading the existing marsh to elevations that will support a combination of salt marsh and non-vegetated intertidal flats and subtidal pond habitats. The low marsh generally between 0.4 to 2.7 feet NGVD will be planted

with salt marsh cordgrass plants during the spring after sufficient time has elapsed after tidal exchange has been restored to determine the areas that have the correct tidal regime.

Mosquito control would be implemented as needed by the local sponsor to ensure that the restoration of tidal flow does not increase mosquito populations.

SECTION IV - ALTERNATIVES CONSIDERED

ALTERNATVE 1, NO ACTION ALTERNATIVE

If no action is taken to restore the salt marsh and estuarine habitats, Town Pond will persist as a degraded non-estuarine marsh dominated by phragmites. The site may change to a shrub, then forested freshwater wetland over a very long period of time, but the persistence of common reed suggests that this process would be slow, particularly if fires occur in the marsh. Fires, which are The improvements in fish and wildlife resource value that would be generated with the project would not be achieved.

ALTERNATIVE 2 RESTORE SALT MARSH AND CREEK HABITATS

This alternative would restore mostly low, or regularly flooded, salt marsh (Figure 3). The existing dredged material would be excavated to elevation 2.9 feet (0.88 meters) along the inland edge of the project area and slope at 1 percent toward a tidal creek. At the tidal creek the slope would change to 1:3. The main channel would have a 5 ft (1.5 m) bottom width and an invert sloping from –2 ft (-0.6 m) at Mount Hope Bay to –1.3 ft (-0.4 m) at the railroad bridge, then to 0.0 ft at the upstream end. Feeder channels would have a 3.3 ft (1 m) bottom width.

High marsh would be located between elevation 2.7 to 2.9 ft (0.83 m to 0.88 m) for a width of 16 ft (5 m). Low marsh would occur between elevation 0.46 to 2.7 ft (0.14 to 0.83) for a width of about 225 ft (69 m). Mudflat would be created, also with a one percent slope (may be adjusted to fit design), between the lower limit of low marsh and the upper edge of the channel. The portion of the main tidal creek below elevation 0.0 ft would contain permanent open water. There would be approximately 2.9 acres (1.2 hectares) of high marsh, 20.8 acres (8.4 hectares) of low marsh, 0.3 acres (0.1 hectares) of mudflats, and 0.8 acres (0.34 hectares) of tidal creeks.

ALTERNATIVE 3 RESTORE A COMBINATION OF FIFTY PERCENT SALT MARSH:FIFTY PERCENT OPEN WATER/INTERTIDAL HABITATS

This alternative would restore about half salt marsh and half open water (Figure 4). The existing dredged material would be excavated to elevation 2.9 ft (0.88 m) along the inland edge of the project area and slope at 1 percent toward the interior of the marsh for a width of 16 ft (5 m). From 16 ft (5 m) out, the slope would change to 1:10 for 33 ft (10 m) of width for most of

the perimeter. Areas of wider salt marsh would slope from elevation 2.7 ft (8.3 m) to the edge shown at variable slopes between 1 to 10 percent. The remainder of the site would slope to the centerline invert at a constant slope (based on distance). The main channel would have an invert sloping from –2 ft (-0.6 m) at Mount Hope Bay to –1.3 ft (-0.4 m) at the railroad bridge. The centerline invert of the restored pond upstream of the railroad bridge would slope from –3.3 ft (-1.00 m) at the bridge to –2.0 ft (-0.60 m) at the upstream end. A weir with a top elevation of -0.2 ft (-0.06 m) would maintain open water depths between 1.8 to 3.1 ft (0.54 to 0.94 m) deep with a median depth at the halfway point of 2.4 ft (0.74 m). Upstream of the railroad bridge there would be no channel.

High marsh would be located between elevation 2.7 to 2.9 ft (0.88 m to 0.83 m) for a width of 16 ft (5 m) on the 1:100 slope. Low marsh would occur between elevation 0.46 to 2.7 ft (0.14 to 0.83 m) on a variable slope for an area of approximately 9 acres. Mudflat would occur between the lower limit of low marsh (0.46 ft; 0.14 m) and the upper edge of the open water (-0.2 ft; -0.06 m). The water surface elevation would be controlled by a weir placed just upstream of the culvert that runs parallel to the railroad bed to maintain permanent open water. The crest of the weir would be placed at –0.2 ft (-0.06 m) to create a low water elevation 8 inches (20 cm) below the lowest elevation of salt marsh to avoid waterlogged soil conditions. The weir would allow periodic flushing of the system if needed and would allow minor adjustments to water levels to be made easily. There would be 2.9 acres (1.2 hectares) of high marsh, 8.4 acres (3.4 hectares) of low marsh, 4.3 acres (1.7 hectares) of mudflats, and 9.2 acres (3.7 hectares) of permanent open water. A weir with a top elevation of -0.06 m would maintain permanent open water depths between 0.88 to 0.54 m deep with a median depth at the halfway point of 0.71 m.

ALTERNATIVE 4 RESTORE THE PREVIOUSLY EXISTING INTERTIDAL/SUBTIDAL HABITATS WITH SALT MARSH FRINGE

These alternatives would restore mostly intertidal flats (Alternative 4a; Figure 5) or salt pond (Alternative 4b; Figure 6) with a thin salt marsh fringe. The existing dredged material would be excavated to elevation 2.9 ft (0.88 m) along the inland edge of the project area and slope at 1 percent toward a tidal creek for a width of 16 ft (5 m). From 16 ft (5 m) out, the slope would change to 1:10 for about 33 ft (10 m). The remainder of the site would slope to the centerline invert at a constant slope (based on distance). The main channel would have an invert sloping from –2 ft (-0.6 m) at Mount Hope Bay to –1.3 ft (-0.4 m) at the railroad bridge. Upstream of the railroad bridge there would be no channel. Two potential centerline invert elevations with the same slope would be considered.

Alternative 4a. The centerline invert of the restored pond upstream of the railroad bridge would slope from –1.3 ft (-0.40 m) at the bridge to 0.0 ft at the upstream end. This would maintain a constant slope from Mount Hope Bay to the upstream end of the project. A weir with a top elevation of –0.2 ft (-0.06 m) would maintain open water depths between 0.0 to 1.1 ft (0.0 to 0.34 m) deep with a median depth at the halfway point of 0.5 ft (0.16 m).

There would be approximately 2.9 acres (1.2 hectares) of high marsh, 4.0 acres (1.6

hectares) of low marsh, 14.7 acres (6.0 hectares) of mudflats, and 3.2 acres (1.3 hectares) of permanent open water. A weir with a top elevation of -0.06 m would maintain a maximum permanent open water depth of 0.28 m with a median depth at the halfway point of 0.14 m.

Alternative 4b. The centerline invert of the restored pond upstream of the railroad bridge would slope from –3.3 ft (-1.00 m) at the bridge to –2.0 ft (-0.60 m) at the upstream end. This would allow a deeper pond to be created to enhance waterfowl and fisheries habitat value. A weir with a top elevation of –0.2 ft (-0.06 m) would maintain open water depths between 1.8 to 3.1 ft (0.54 to 0.94 m) deep with a median depth at the halfway point of 2.4 ft (0.74 m).

There would be approximately 2.9 acres (1.2 hectares) of high marsh, 4.0 acres (1.6 hectares) of low marsh, 5.7 acres (2.3 hectares) of mudflats, and 12.2 acres (5.0 hectares) of permanent open water. A weir with a top elevation of -0.06 m would maintain permanent open water depths between 0.88 to 0.54 m deep with a median depth at the halfway point of 0.71 m.

Under both open water alternatives, high marsh would occur between elevation 2.7 to 2.9 ft (0.83 to 0.88 m) for a width of 16 ft (5 m) on the 1:100 slope. Low marsh would occur between elevation 0.46 to 2.7 ft (0.14 to 0.83 m) for a width of 23 ft (6.9 m) on a 1:10 slope. Mudflat would occur between the lower limit of low marsh (0.46 ft; 0.14 m) and the upper edge of the open water –0.2 ft (-0.06 m). The water surface elevation would be controlled by a weir placed just upstream of the culvert that runs parallel to the railroad bed to maintain permanent open water. The crest of the weir would be placed at –0.2 ft (-0.06 m) to create a low water elevation 8 in (20 cm) below the lowest elevation of salt marsh to avoid waterlogged soil conditions. The weir would allow periodic flushing of the system if needed and would allow minor adjustments to water levels to be made easily. Additional excavation would be required for Alternative 4b to create up to 1.8 to 3.1 ft (0.54 to 0.94 m) of permanent open water behind the weir, but the quality of the habitat may be greater.

ALTERNATIVE 5, SALT MARSH AND TIDAL CREEK RESTORATION WITH ON-SITE DISPOSAL

This alternative differs from Alternative 2 only in the fact that it has on-site disposal, which reduces the area of habitat restored. As with Alternative 2, the existing dredged material would be excavated to elevations that would support salt marsh (mostly low marsh) with creeks to convey tidal flow (Figure 7). There would be approximately 1.20 acres (0.49 hectares) of high marsh, 14.2 acres (5.75 hectares) of low marsh, 0.2 acres (0.08 hectares) of mudflats, and 0.5 acres (0.2 hectares) of tidal creeks.

ALTERNATIVE 6, 50 % SALT MARSH AND 50 % OPEN WATER WITH ON-SITE DISPOSAL

This alternative is similar to Alternative 3, except that it has on-site disposal, which reduces the area of habitat restored. As with Alternative 3, the existing dredged material would be excavated to elevations that would support about half salt marsh and half mudflat/open water (Figure 8). There would be 2.33 acres (0.95 hectares) of high marsh, 4.48 acres (1.81 hectares) of low marsh, 2.98 acres (1.20 hectares) of mudflats, and 5.37 acres (2.17 hectares) of permanent open water. A weir with a top elevation of -0.2 ft (-0.06 m) would maintain permanent open water depths between 0.2 to 2.9 ft (0.54 to 0.88 m) deep with a median depth at the halfway point of 2.3 ft (0.71 m).

Figure 6. Alternative 2

Figure 6. Alternative 3

Figure 6. Alternative 4A

Figure 6. Alternative 4B

Figure 7. Alternative 5

Figure 8. Alternative 6

SECTION V - AFFECTED ENVIRONMENT

GENERAL

The site includes the former habitats in the portion of Town Pond south of the railroad crossing (Figure 1). A tidal inlet formerly connected Town Pond to Mount Hope Bay. A remnant of the inlet remains. The area has changed from salt pond, tidal flat, and salt marsh and to phragmites marsh and shrub vegetation since the disposal of dredged material from construction of the Fall River ship channel. This degradation of the vegetation type has been observed at other sites in New England where marshes were filled or the tidal range was reduced.

WETLANDS, VEGETATION, AND COVER TYPES

Vegetative cover at the Town Pond project site consist primarily of phragmites marsh, fresh and estuarine open water, salt marsh, and upland habitats. The approximate area of each vegetation community is shown in Table 1. These cover types are described in the following paragraphs and are shown on Figure 9, a 1994 color aerial photograph.

Table 1. Approximate Area of Vegetation Communities at Town Pond

Vegetation Type	Area (acres)
Dune	2.3
Salt Marsh	3.7
Salt Pond	0.6
Phragmites Marsh	20.9
Phragmites/Shrub Mixture	2.1
Shrub and Shrub/Forest	32.8
Grass/Shrub Mixture	1.4
Freshwater Ponds and Streams	6.0
Freshwater Marsh	0.7

Cover Types

General. Vegetation types in a coastal wetland are strongly influenced by tidal elevation, which affects the frequency of flooding, and salinity. Salinity and elevations relative to tide heights are sufficient to maintain salt marsh in the portions of Town Pond north of the railroad embankment. These areas were not affected by disposal of dredged material. Salinity concentrations in Mount Hope Bay are in the range of 29 to 31 parts per thousand (ppt) (Pilson and Hunt 1989), which is sufficient to maintain salt marsh. The vegetation community south of the railroad embankment (upstream) reflects the increased elevation from dredged material disposal. The area is no longer flooded by tides because its height is above the level of the highest tides.

Salt Marsh. Salt marsh makes up about 3.7 acres of Town Pond, but is present only upstream of the railroad embankment. Salt marshes are generally classified into two types (high marsh and low marsh) based on the dominant vegetation and its characteristics and the frequency of tidal flooding. The low salt marsh vegetation consists almost exclusively of salt marsh cordgrass (*Spartina alterniflora*). The taller form of this species grows in the low marsh where frequent flooding and draining of the sediments creates favorable growth conditions. The low salt marsh extends from a lower limit around mean sea level, depending on a number of hydrologic factors, to about mean high water (MHW).

High salt marsh is situated between about MHW and the level of the highest astronomic tides (Lefor *et. al*. 1987; Bertness and Ellison 1987) or mean spring high water (MSHW) (Niering and Warren 1980). MSHW is probably a good estimate of the upper limit of the marsh plain with higher astronomic tides and storm tides flooding the generally steeper sloped upper border of the marsh where high tide bush (*Iva frutescens*) and switchgrass (*Panicum virgatum*) grow.

Table 2. Salt Marsh Species Observed during Field Investigations

Common Name	**Scientific Name**
Salt marsh cordgrass	*Spartina alterniflora*
Salt meadow grass	*Spartina patens*
Spike grass	*Distichlis spicata*
Saltwort	*Salicornia europaea*
Sea lavender	*Limonium sp.*
Marsh orach	*Atriplex patula*
High tide bush	*Iva frutesens*
Switchgrass	*Panicum virgatum*

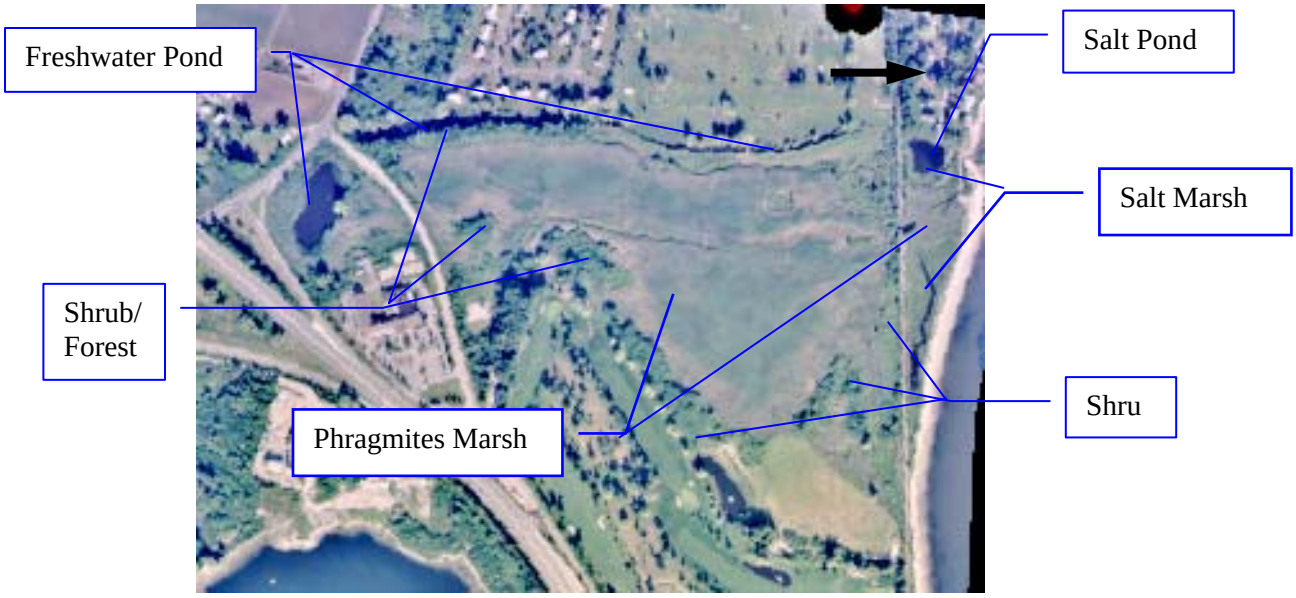


Figure 9. Town Pond Major Habitat Types – 1994.

The high marsh supports a greater diversity of vegetation than the low marsh, but is usually dominated by one or a combination of four plants. Salt meadow grass (*Spartina patens*) is usually most abundant and grows over most of the high marsh. Spike grass (*Distichlis spicata*) grows intermixed with salt meadow grass and is often dominant in areas of particularly high or low salinity, where the soils are waterlogged, and in recently disturbed areas. Black grass (*Juncus gerardi*) grows in locally high areas and on the upper border of the high marsh. The short form of salt marsh cordgrass grows where the soil is waterlogged or covered with shallow water.

All of the existing salt marsh at Town Pond is located upstream of the railroad embankment. In addition to the dominant salt marsh species listed above, other species observed in this portion of the marsh include common glasswort (*Salicornia europaea*), sea lavender (*Limonium* sp.), seaside goldenrod (*Solidago sempervirens*), high tide bush, switchgrass, sea blight (*Suaeda linearis*), marsh orach (*Atriplex patula*), and phragmites. Salt marsh cordgass intermittently borders the main channel into the marsh.

Intertidal and Subtidal Channel Habitats. The inlet to Town Pond flows from Mount Hope Bay and through the railroad crossing, before reaching a tide gate where it meets with nontidal portions of Founder's Brook.

Small minnows such as mummichogs (*Fundulis* sp.) and Atlantic silversides (*Menidia menidia*) were observed in the channel. Small amounts of oysters (*Crassostrea virginica*) are present in a few areas on the rocky substrate. However, there is a downward trending gradient in the quality of estuarine habitat moving upstream from Mount Hope Bay to the railroad embankment as shown by the composition of the benthic community.

No eelgrass (*Zostera marina*) or other submerged aquatic vegetation was evident in the inlet channel.

Phragmites (*Phragmites australis*) wetlands. Phragmites covers the largest area of Town Pond. Phragmites is a relatively low value species ecologically compared to salt marsh plant species, which are generally recognized as having high ecological value.

Because phragmites tends to grow in dense stands that exclude other vegetation, the diversity of marshes dominated by phragmites tends to be low. High plant and animal species diversity is generally considered to be a positive ecological habitat characteristic. Marshes with high plant diversity have more potential to support a diverse animal community, so the animal community that uses phragmites-dominated marshes tends to be less diverse. Corps of Engineers staff observed few other species of vegetation in the area dominated by phragmites at Town Pond.

Although the productivity of phragmites is quite high, the value of the plant material is limited compared to other types of vegetation. Whereas a portion of salt marsh production is exported to the aquatic and terrestrial food webs, phragmites production is, to a large extent,

unavailable to food webs. It has relatively low value as a food item because of the coarseness of its stems and leaves and its hairy seeds.

In addition, phragmites cover is a potential fire hazard and Roman *et al*. (1984) described stagnant phragmites marshes as prime mosquito breeding areas.

The areas dominated by phragmites at Town Pond are shown in Figure 9.

Freshwater Emergent Wetland. The freshwater pond between Anthony Road and Route 138 has an edge dominated by cattails (*Typha* sp.), with phragmites at higher elevations. These areas are shown in dark blue on the cover map.

Surrounding Uplands. The uplands surrounding Town Pond support golf courses, residential development, and small areas of forest. Some of the upland plant species inhabiting areas adjacent to the marsh are shown in Table 3.

BENTHIC INVERTEBRATES AND SHELLFISH

Benthic Invertebrates

Benthic invertebrates include clams, snails such as periwinkles (e.g. *Littorina* spp.), crabs (e.g. blue crab, *Callinectes sapidus*), polychaete worms (e.g. (*Nereis virens*), amphipod crustaceans (e.g. *Corophium insidiosum*), and others. They play an important role in the estuarine detritus-based food web. Those species that feed on detrital material, produced in large part by the surrounding salt marshes, accelerate decomposition and reuse of organic material as well as providing a food source for animals higher in the food web such as fish and birds (Whitlatch 1982).

Six paired benthic core samples were collected in the main inlet channel at Town Pond to characterize the benthic invertebrate community in the project area (Figure 10). Samples were collected with a core tube with an area of 40.7 cm^2 to a depth of 10 cm, sieved onsite with a 0.5 mm screen. The samples were then transported to Sheldon Pratt at the University of Rhode Island, Graduate School of Oceanography, where they were preserved in a solution of 10% formaldehyde with 0.1% rose bengal stain, sorted and identified. Methods and results of these analyses are presented in Appendix EA-B and summarized below.

Based on the sample results, the bottom type changes considerably moving from the inlet to Mount Hope Bay toward the marsh (Table 4). The samples nearest to Mount Hope Bay contained sand, gravel and stones and shell fragments (Sations 1, 2, and 3). Station 4B had similar, but less coarse, material and Station 4A had sand and silt. The upstream samples (Stations 5 and 6) were collected from soft anoxic mud with a strong hydrogen sulfide odor and phragmites fragments.

Table 3. Vegetation Observed in the Shrub and Forested Cover Types.

Arrow wood	*Viburnum dentatum*
Pussy willow	*Salix nigra*
Poison ivy	*Rhus radicans*
Smooth sumac	*Rhus glabra*
Staghorn sumac	*Rhus typhina*
Honeysuckle	*Lonicera japonica*
Mullein	*Verbascum thapsus*
Gray birch	*Betula populifolia*
Rose	***Rosa rugusa***
Weeping willow	***Salix babylonica***
Common reed	*Phragmites australis*
Red cedar	*Juniperus virginiana*
Beach rose	*Rosa rugosa*
Bayberry	*Myrica pensylvanica*
Black cherry	***Prunus serotina***
Autumn olive	***Elaeagnus umbellata***
Blackberry	***Rubus cuneifolius***
Milkweed	*Asclepias syriaca*
White Pine	***Pinus strobus***

At all stations, species diversity was low relative to Mount Hope Bay. Diversity was highest at the stations nearest to the inlet to Mount Hope Bay (Figure 11) and declined to 1-3 species at the innermost stations (Stations 4, 5, and 6). The most abundant and diverse taxanomic groups were annelid worms and amphipods. Oligochaetes, subsurface deposit feeders, were the most numerous taxonomic group sampled, with high densities at stations 3 and 4. Three species of omnivorus surface dwelling amphipods were recovered in samples from stations 2 and 3. The number of benthic animals per sample increased from the inlet of the channel at Mount Hope Bay to the stations about 425 feet upstream, then decreased substantially in the samples nearer to the railroad crossing (Figure 12). The most upstream samples contained

only one organism each demonstrating the stressed conditions that exist.

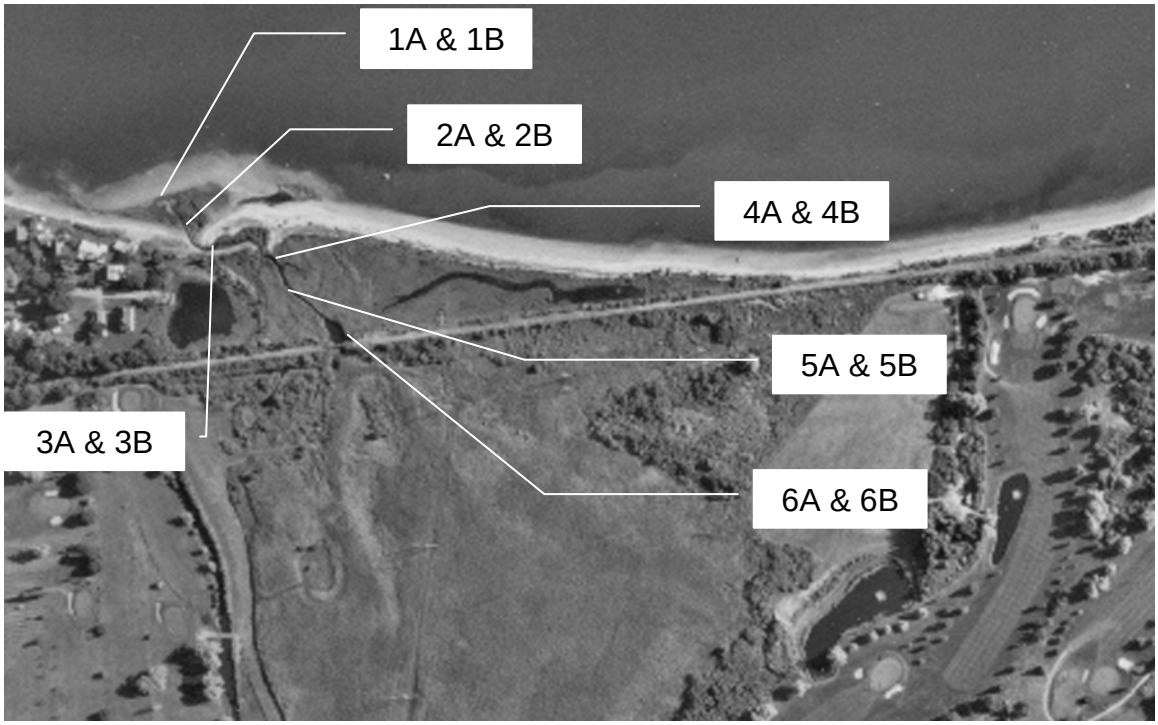
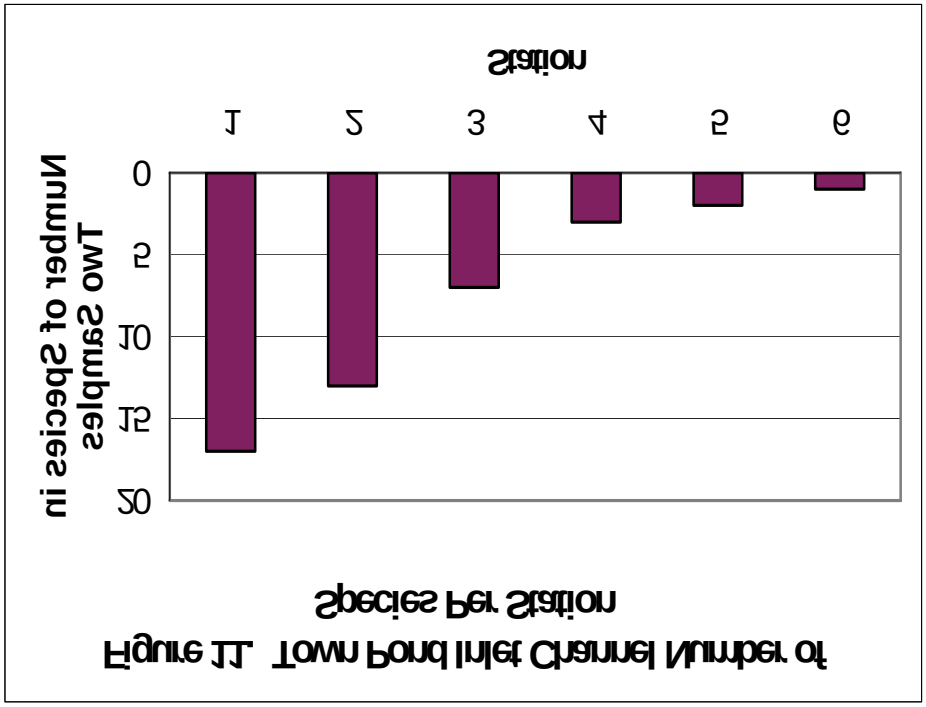


Figure 10. Approximate Benthic Sample Locations at the Town Pond Tidal Inlet

Station 1, located in the inlet at the entrance to Mount Hope Bay, differed from the other stations in the presence of species common in Narragansett Bay and the low numbers of oligochaetes and amphipods present. Stations 2 and 3, located closer together than the other stations and within a similar substrate, had high numbers of individuals and shared many species. No organisms were found in sample 4A, which was located in a sandy/silt substrate compared to sample 4B, which was located in stoney substrate with silty sand. The three species found in sample 4B were found in the stations nearer to the inlet at higher density. Stations 5 and 6 combined had only eight organisms, half of which were midges (chironomid insects).

Table 4. Substrate Characteristics at Town Pond Sample Stations

Station	Substrate Characteristics
1A	Cobble, gravel, sand, and shell.
1B	Cobble, gravel, sand, and shell.
2A	Cobble, gravel, sand, silt, and shell.
2B	Cobble, gravel, sand, silt, and shell.
3A	Gravel, sand, silt, and shells. Beginning of salt marsh fringe.
3B	Gravel, sand, silt, and shells. Beginning of salt marsh fringe.
4A	Sand and silt. Bank is salt marsh.
4B	Gravel, sand, and silt.
5A	Very soft black mud with hydrogen sulfide odor and phragmites lined bank.
5B	Very soft black mud with hydrogen sulfide odor and phragmites lined bank.
6A	Very soft black mud with hydrogen sulfide odor and phragmites lined bank.
6B	Very soft black mud with hydrogen sulfide odor and phragmites lined bank.



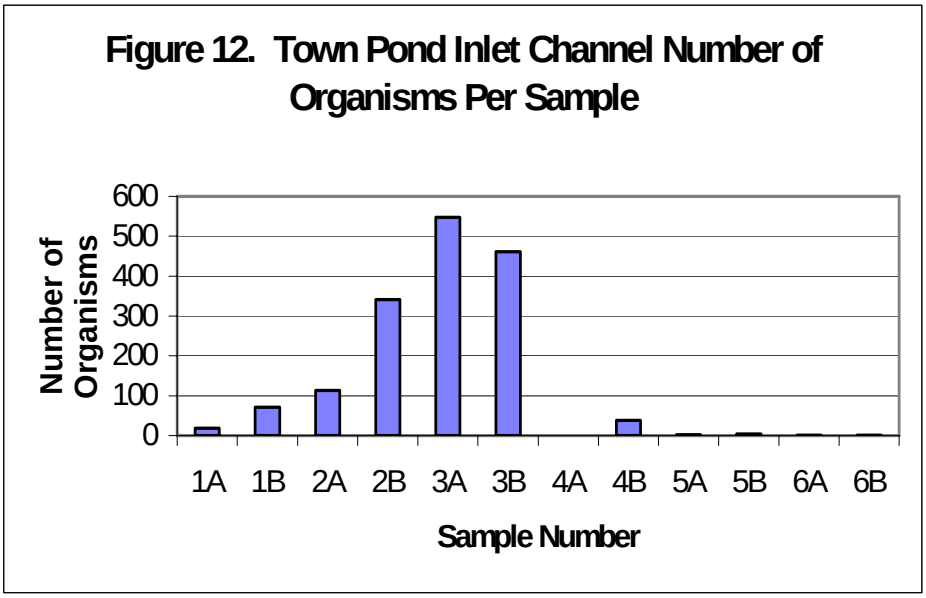


Figure 12. Town Pond Inlet Channel Number of Organisms Per Sample
Number of Organisms
600
500
400
300
200
100
0
1A
1B
2A
2B
3A
3B
4A
4B
5A
5B
6A
6B
Sample Number

FISH

Fish are an obvious and important component of the marsh/estuarine system. Sampling of fish was not conducted for this assessment, however, fish use can be characterized by considering general fish use of salt marsh-dominated estuaries in the area. Some important estuarine fish that use salt marshes are listed in Table 5. This list is based on information prepared by Werme (1981) (as presented by Teal 1986) for the Great Sippewissett Salt Marsh in Massachusetts. Most fish use the marsh portion of the estuarine system when it is temporarily flooded by tides, but some, such as the mummichog (*Fundulus heteroclitus*) and striped killifish (*F. majalis*), are permanent residents of the marsh ponds. Mummichogs were observed in the Town Pond channel. In general, the more frequently flooded the marsh is the more it is used by non-resident fish.

The inlet to Town Pond flows into Mount Hope Bay. Mount Hope Bay is an important fishery resource and supports a wide range of marine species and an important recreational fishery. It is an important winter flounder spawning area. Striped bass and bluefish are among the important recreational species in the bay.

There is very little Essential Fish Habitat associated with the project site. Only the inlet to the former Town Pond contains estuarine fish habitat. The only fish species from the National Marine Fisheries Service list of EFH species likely to use the site is winter flounder.

WILDLIFE

A list of birds, mammals, reptiles, and amphibians that may be associated with the wetland habitats in the vicinity of Town Pond is provided in Table 6. Likely inhabitants of the wildlife habitats in and around Town Pond are described in the following sections.

Intertidal Habitats

Unvegetated intertidal habitat or tidal flats and creeks provide feeding, resting and migratory habitat for shorebirds, gulls and terns, wading birds, waterfowl, diving birds, and raptors. They are most important for shorebirds and, when flooded with shallow water, wading birds because these species feed almost exclusively in intertidal zones (Whitlatch 1982).

Open Water

Permanent estuarine water is present in two small ponds just north of the railroad embankment and, of course in Mount Hope Bay. The permanent open water component of the salt marsh/estuarine system is important for wildlife. Open water provides important resting and feeding habitat for waterfowl and feeding habitat for wading birds.

Shallow water provides habitat for dabbling ducks, which do not dive during feeding, while deeper areas provide habitat for diving ducks and other diving birds. Small and medium sized mammals such as mink and otters may also feed in estuarine open water. Brant, black ducks, and great blue heron were observed using open water habitats during field investigations for the project.

Table 5
Fishes Inhabiting Great Sippewissett Salt Marsh
Massachusetts (From Werme 1981).*

Fishes that spend most of their lives within the marsh:

Common name	Scientific name
Atlantic silverside	*Menidia menidia*
mummichog	*Fundulus heteroclitus*
striped killifish	*Fundulus majalis*
sheepshead minnow	*Cyprinodon variegatus*
four-spined stickleback	*Gasterosteus aculeatus*
common eel	*Anguilla rostrata*

Fishes that use the marsh mostly as a nursery area:

winter flounder	*Pseudopleuronectes americanus*
tautog	*Tautoga onitis*
sea bass	*Centropristes striata*
alewife	*Alosa pseudoharengus*
menhaden	*Brevoortia tyrannus*
bluefish	*Pomatomus saltatrix*
mullet	*Mugil cephalus*
sand lance	*Ammodytes americanus*
striped bass	*Morone saxatilis*

*Listed in approximate order of abundance within each group.

The freshwater ponds making up the portion of Founder's Brook behind the berm adjacent to the west side of Town Pond appear to support an abundant wildlife community. Local residents have reported observations of muskrats, mink, otters, red fox, and snapping turtles, as well as an abundant warm water fish community. Raccoon tracks were observed in the vicinity of freshwater ponds at the site during field investigations. A berm between the ponds and phragmites marsh supports deciduous shrubs and trees and provides good linear cover and feeding habitat for wildlife using the adjacent marsh and ponds.

Salt Marshes

Salt marshes are important wildlife habitats. Over 100 species of invertebrates including insects, snails and crabs have been found on New England salt marshes. Although mammals are less abundant, small mammals such as meadow voles (*Microtus pennsylvanicus*), white-footed mouse (*Peromyscus leucopus*), and masked shrews (*Sorex cinereus*) use the dense mat of high marsh vegetation. Larger mammals such as raccoons (*Procyon lotor*), mink (*Mustela vison*), skunk (*Mephitis mephitis*), weasels (*Mustela* spp.), and muskrats (*Ondatra zibethicus*) feed on the marsh (Nixon 1982). The seeds of the high salt marsh dominants (salt meadow grass, black grass, and spike grass) provide food for black ducks (*Anas rubripes*), Canada geese (*Branta canadensis*) and other waterfowl, marsh birds, and small mammals. The shoots and rootstocks provide forage for muskrats, small mammals and waterfowl (Amos and Amos 1985; NAD, ACOE 1977; Niering 1968). The only reptile present in any great numbers on the New England salt marsh is the diamond-backed terrapin (*Malaclemys terrapin*) (Teal 1986).

Birds are the most conspicuous of the salt marsh wildlife. Nixon (1982) presented a list (Table 7 of birds that use salt marshes based on information provided by the U.S. Fish and Wildlife Service.

Phragmites

Phragmites marshes support a less abundant and diverse wildlife community than salt marshes and most other wetland types. It generally grows in less diverse stands and has relatively low value as a food item because of the coarseness of its stems and leaves and its hairy seeds. Phragmites does provide cover and nest sites for some species of birds such as red-winged blackbirds (*Agelaius phoeniceus*) and provides fall roosting sites for migrating tree swallows (*Iridoprocne bicolor*). Weiss (1995) indicated that thousands of tree swallows flock along the coast during the fall. Local residents have confirmed use of Town Pond by swallows. The wildlife value of phragmites includes food for muskrats, although of low quality, and insect production, which in turn serves as food for terrestrial and aquatic organisms (Howard *et al*. 1978; NAD, ACOE 1977).

Coastal Shrub Habitats

Coastal shrub and dune habitats are valuable for a number of species of wildlife. They provide cover and nesting habitat for shorebirds, song birds, and gulls and terns and cover and forage areas for mammals and song birds (Woodhouse, 1982).

Table 6
Bird Habitat Use-Species Associations in New England Salt Marshes

(From Nixon, 1982 as provided by Ralph Andrews of the U.S. Fish and Wildlife Service.)

Nest and feed in high marsh:

Sharp-tailed sparrow
Long-billed marsh wren (*Typha* or *Phragmites*)
Meadowlark
Savannah sparrow (highest areas)
Marsh hawk
Short-eared owl (local)
Black rail (rare)

Nest in high marsh, but feed in pools of *S. alterniflora* zone:

Clapper rail
Willet
Black duck
Blue-winged teal
Canada goose
Seaside sparrow

Nest in high marsh, but feed in open water:

Gulls
Terns

Nest in high marsh, but feed in open marsh:

Yellowthroat
Song sparrow
Catbird
Kingbird
Redwing
Grackle

Nest on woody islands; feed in the marsh:

Herons
Egrets
Glossy ibis

Nest elsewhere; feed on insects over marsh:

Swallow
Chimney swift

MOSQUITOES

Mosquitoes are part of the fauna of both freshwater marshes and salt marshes. Extensive mosquito control work has been conducted at Town Pond. Four species of mosquito have been collected in the marsh: *Aedes cantator, Ades vexans, Culex pipiens,* and *Culex restuans*. The primary problem mosquito in the Town Pond marsh is *Aedes cantator,* which can breed at densities of thousands per square foot in areas directly under the power lines (Correspondence dated November 24, 1998 from George D. Christie, Christie Mosquito Control, North Kingstown, RI).

Aedes sollicitans is the most common of the salt marsh mosquitoes and probably inhabits the existing high marsh on the study site. Teal (1986) described its life history: "The marsh mosquito, (*Aedes sollicitans*), lays its eggs on wet mud in the higher marsh rather than the low marsh. The eggs develop to the hatching point, then wait until they are flooded by an extra high tide or heavy rain before hatching. In warm weather they can become adults in about one week, emerging from the pools in hordes." Nixon (1982) indicated of the salt marsh mosquito, "...the *Aedes* spp. which breed on the high marsh travel farther and feed more voraciously (at least on man and his domestic animals) than species which breed in areas that are more or less permanently flooded".

THREATENED AND ENDANGERED SPECIES

There are no Federally listed or proposed threatened or endangered species under the jurisdiction of the Fish and Wildlife Service known to exist at the project site with the exception of occasional, transient bald eagles (*Haliaeetus leucocephalus*) or perigrine falcons (*Falco peregrinusanatum*) (Correspondence dated February 25, 1999).

The Rhode Island Natural Heritage Program has indicated that at the present time there are no state-listed threatened or endangered species utilizing the project site. Several species that are rare in the state of Rhode Island used the Town Pond area in the past. These include pied-billed grebe, common moorhen, green-winged teal, least bittern, marsh wren, and sora (Correspondence dated February 18, 1999).

WATER QUALITY

Salinity is an important parameter in the evaluation of salt marsh restoration projects. Pilson and Hunt (1989) measured salinity in Mount Hope Bay and Narragansett Bay in the vicinity of Town Pond. The salinity in Mount Hope Bay was slightly lower than in Narragansett Bay ranging from 29.00 parts per thousand (ppt) near the surface to 30.53 ppt at the bottom, compared to 30.05 to 31.21 ppt at the nearest location in Narragansett Bay. Mr. Thurston Gray, a volunteer for Save The Bay, sampled salinity at the railroad tracks over the inlet to the Town Pond site between June 1998 and April 2001. Salinity ranged from 0.0 to 26 ppt depending on

the direction of the tide, rainfall, and other factors. These salinity levels are well within the range necessary to restore salt marsh plants.

Mount Hope Bay near Town Pond is classified SA according to the Rhode Island Water Quality Regulations, Water Use Classification. However it is not meeting the criteria for that classification, and is therefore on the Section 303d list of the State's impaired waters, where it is listed as impaired for dissolved oxygen, nitrogen, phosphorus, and biodiversity. Founder's Brook is unassessed; therefore, its assumed classification is B. All wetlands and ponds are assumed to be Class A or SA depending on their salinity.

Class SA waters are designated for shellfish harvesting for direct human consumption, primary and secondary contact recreational activities, and fish and wildlife habitat. According to the classification, they shall be suitable for aquaculture, navigation, and industrial cooling and shall have good aesthetic value.

Class A waters are designated as a source of public drinking water supply, for primary and secondary contact recreational activities, and fish and wildlife habitat. According to the classification, they shall be suitable for compatible industrial process and cooling, hydropower, aquaculture, navigation, and irrigation and other agricultural uses and shall have good aesthetic value.

Class B waters are designated for fish and wildlife habitat and primary and secondary contact recreational activities. According to the classification, they shall be suitable for compatible industrial process and cooling, hydropower, aquaculture, navigation, and irrigation and other agricultural uses and shall have good aesthetic value.

SEDIMENT QUALITY

The project site was surveyed for evidence of hazardous, toxic, or radiological waste; no evidence of such contamination was observed. The material placed in Town Pond was from the Fall River entrance channel deepening. In general, material from deepening projects does not contain significant quantities of contaminants because it was deposited prior to industrialization. Based on land uses in the vicinity of the site, the relatively clean uses of areas surrounding Town Pond, and the source of the material, there is little reason to expect contamination of the sediments to be excavated. However, sediment chemistry testing was performed to confirm these expectations.

The New England District collected samples of the material to be excavated at the locations shown in Figure 13. Cores were collected to one meter depth at stations S–1 and S–3 and to 2 meters depth at station S–2 (i.e. the approximate depth of excavation at each location). If any layering is evident in the cores, one sample will be collected for each layer up to a maximum of two samples for stations S – 1 and S – 3, and three samples at station S – 2. Samples were not collected in the original substrate (i.e. below the sediment surface prior to

dredged material disposal).

In general, the testing confirmed initial expectations for the material. The results of the tests show concentrations of potential contaminants are mostly below detection limits and, with one exception, are below all applicable regulatory standards. Concentrations of total petroleum hydrocarbons (TPHs) exceed the Rhode Island Department of Environmental Management criterion for Class III dredged material. Since it did not violate the TCLP criteria, the material would not be considered a Hazardous Waste. However, according to the Department's Dredged Materials Disposal Requirements, the material would be considered a solid waste because tests exceeded the criterion for TPHs.

The concentrations for TPHs exceed the Class III criterion in three samples (Appendix C). This result is somewhat inconsistent given the source of the material and results for the other constituents, in particular the low concentrations of polycyclic aromatic hydrocarbons. High measured concentrations of TPHs can result from the presence of naturally occurring gums and oils not related to man-made contaminants and without the potential for adverse effects. To further consider these results the Corps' chemist obtained and reviewed the chromatograms for the samples. Although the results were correctly reported as within the range of gasoline range organics, diesel fuel and motor oil, none of the chromatograms for the samples exactly matched the chromatograms for gasoline, diesel fuel, or motor oil. It cannot be conclusively determined whether the concentrations reported for TPHs result from man-made oils and grease, or naturally occurring substances. However, given the source of the material, the lack any obvious source of contamination, and the results showing very low levels of contamination for other man-made sources, it is not likely that the TPH results indicate petroleum contamination.

AIR QUALITY

The entire state of Rhode Island is designated a non-attainment zone of ozone (O_3) and is part of the Northeast Ozone Transport Region which extends northeast from Maryland and includes all six New England states. Non-attainment zones are areas where the National Ambient Air Quality Standards (NAAQS) have not been met. Nitric oxide (NO), hydrocarbons, oxygen (O_2), and sunlight combine to form ozone in the atmosphere. Nitrogen oxides are released during the combustion of fossil fuels.

HISTORIC AND ARCHAEOLOGICAL RESOURCES

The proposed site is located on the south side of a railway embankment that runs along the shore of Mount Hope Bay, approximately 0.6 miles east of the Mount Hope Bridge. A small area of salt marsh exists north of the railway embankment. Founders Brook flows in a northerly direction through the former Town Pond area, through an opening in the railway embankment, and out into Mount Hope Bay. The former Town Pond area was originally an open cove and used as a port in the 1600's. Portsmouth's status as a major port declined with the rise to

prominence of Newport.

During the 1950's, the Town Pond was filled in with the dredged material spoils from the Fall River Harbor Navigation Improvement Project. The habitat at the project site historically consisted mostly of salt pond with a relatively small proportion of salt marsh. Disposal of dredged material in the pond converted the majority of the area from salt pond to common reed (*Phragmites australis*) marsh. The common reed marsh is now above the level of tidal inundation.

A review of archaeological site files at your office indicated that no known historic or archaeological resources are recorded for the study area. Several sites, however, are located in the immediate vicinity of the project area. RI 1632 is located opposite the proposed study area on Boyd's Lane. This site was located by walkover survey and consists of plowed, surface finds recorded by Rhode Island College. Further study was recommended. RI 1185 is situated to the south of the project area along Founder's Brook and consists of portions of a much larger prehistoric site which was disturbed during highway construction. Lastly, RI 153 (Founder's Memorial Grove) consists of a reported Native American burial site which was also destroyed during construction activities. Each of these sites is located outside of the bounds of proposed project implementation measures.

SECTION VI - ENVIRONMENTAL CONSEQUENCES

GENERAL

The purpose of this project is to restore previously existing estuarine habitats and their value for fish and wildlife. Except for short-term negative effects, this project will primarily have positive effects on the environment.

- The area of estuarine habitat including salt pond and salt marsh will be increased;
- Access to Town Pond by estuarine organisms will be restored, strengthening the ecologic link between the marsh and Mount Hope Bay;
- The contribution of the site to estuarine aquatic productivity will be restored;
- The majority of the relatively low value phragmites will be replaced by higher value salt marsh plants;
- The value of the site for shellfish, fish, and wildlife will be increased; and
- The recreational and aesthetic qualities of the site will be improved.

The effects of the project are described in detail in the following sections.

WETLANDS, VEGETATION, AND COVER TYPES

General

In general, the effect of the project on the vegetation community will be to reduce the amount of phragmites and replace it with salt marsh vegetation or unvegetated tidal habitats. More detailed predictions of the vegetation community and the factors controlling the change in plant species composition are presented in the following paragraphs.

Construction Phase Effects

There will be temporary impacts to wetland, beach, and upland vegetation during the construction period. Vegetation removal in the staging and access areas will temporarily disturb an area of approximately 1 to 2 acres of upland vegetation and asphalt at the southeastern end of the site off Anthony Road, near the Roger Williams College property. The size of disturbance of the staging area and access roads will be limited to the minimum necessary for construction access and a line of erosion control devices will be established along the perimeter. These areas will be allowed to revegetate following construction and areas with severe slopes or disturbed soils with a high potential to affect water quality will be replanted to limit erosion.

A small area of salt marsh (approximately 80 square feet) will be destroyed to deepen and realign the entrance channel inlet. Salt marsh plants will be removed prior to construction and planted along the new channel alignment to reestablish a salt marsh cordgrass fringe resulting in no net change in wetland area.

Long-term Effects

The most rapid and direct effect of the project on vegetation will be the removal of phragmites and other vegetation from the restoration area as the site is excavated and graded. Approximately 18 acres of phragmites, which is above the elevation of tidal influence, will be removed to restore salt marsh and estuarine habitat. Once elevations are established that are flooded by frequent tides estuarine habitats and vegetation communities will establish.

All of the alternatives require some phragmites wetland filling to construct a water control berm along the west side of the site to prevent flooding of Founder's Brook by salt water and to create a public access at the southern end of the site (Figures 3 through 8). The water control berm would fill approximately 3.2 acres of wetland and the public access area would fill approximately 0.35 acre of wetland. The berm would be seeded with coastal grass and shrubs would be planted at occasional intervals along the top.

If the alternatives that provide offsite disposal (Alternatives 2, 3, 4a, and 4b) prove to be impracticable or unavailable, on-site disposal will be necessary. Alternatives 5 and 6 have on-site disposal in phragmites wetlands. Alternative 5 would require 5 acres of wetland fill and Alternative 6 would require 7 acres of wetland fill. The disposal area will be seeded with coastal grasses (e.g. switchgrass) after construction is complete to create a coastal grass community.

The major goals of reintroduction of tidal flow with respect to the plant community are to increase the frequency of flooding and soil water salinity to eliminate common reed and restore conditions that favor the growth of salt marsh vegetation. The level of soil water salinity required to eliminate common reed and restore salt marsh is estimated at 20 parts per thousand (ppt) based on the pertinent literature (Howard et. al., 1978; Odum et. al., 1984; Mitsch and Gosselink, 1986; Garbisch, 1986; Sinicrope et. al., 1990). The salinity in Mount Hope Bay has been recorded at 29 to 30 ppt., which is sufficient to restore salt marsh.

Based on evaluations conducted for the Galilee Salt Marsh Restoration Project (Myshrall, University of Rhode Island, Department of Natural Resources Science, pers. com., May 1999) and the Sagamore Marsh Restoration project, at least eight flooding tides per month are necessary to maintain salt marsh. Portions of Town Pond above the elevation flooded by this tide up to the highest astronomic tide level will likely be composed of a mixture of phragmites and salt marsh vegetation. The lower limit of the salt marsh should occur at about the mean tide level.

Figure 14. Town Pond Actual and Predicted Vegetation Ranges

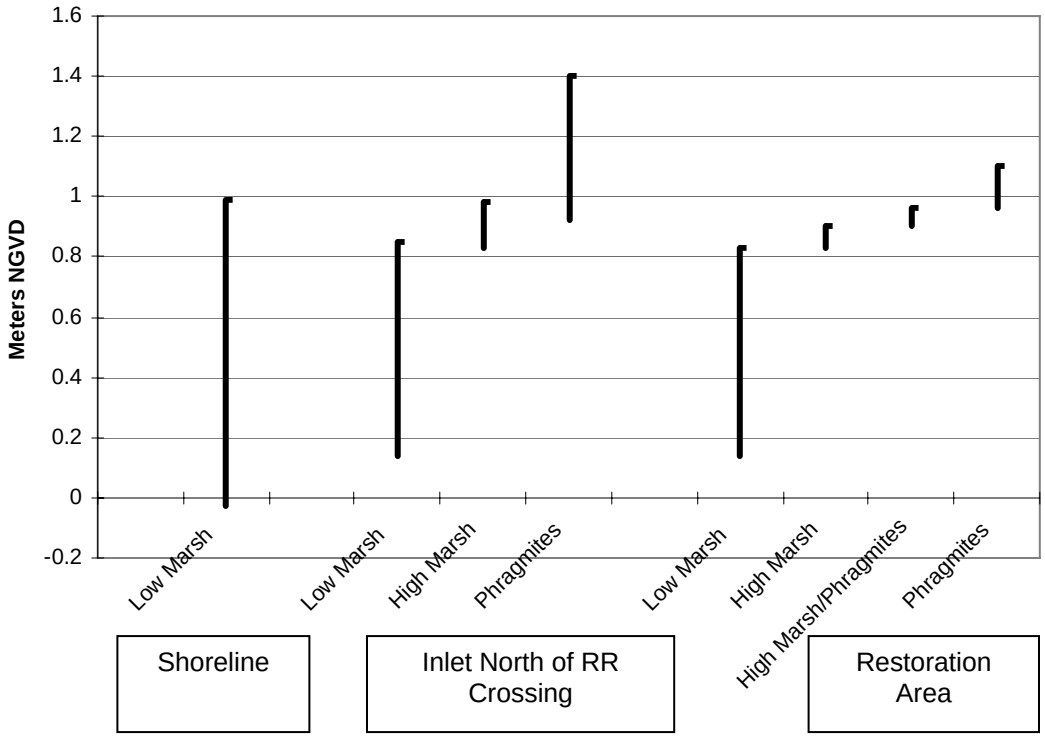


Table 8. Elevations of Habitat Types at the Town Pond Restoration Area

Habitat Zone	Lower Limit (feet/meters NGVD)	Upper Limit (feet/meters NGVD)
Permanent open water	-1.3/-0.4 (lowest graded elevation)	0.0
Mudflat (non-vegetated intertidal)	0.0	0.46/0.14
Low salt marsh	0.46/0.14	2.7/0.83
High salt marsh	2.7/0.83	2.9/0.88
Phragmites marsh/high marsh mixture	2.9/0.88	3.1/0.95
Phragmites marsh	3.1/0.95	not applicable

To estimate the elevation of habitat types in the restored marsh, Corps of Engineers staff measured the elevations of habitat types downstream of the restoration area along the inlet channel north of the railroad crossing and on the Mount Hope Bay shoreline. The elevation ranges of marsh /estuarine habitat zones were estimated based on those measurements and consideration of the tidal range that would be restored in the restoration area. (See Appendix D for a more detailed discussion.) The ranges of these habitat zones are shown in Figure 14 and Table 8.

Predictions of the post-project plant community for the alternatives are shown in Table 9. Column 1 of Table 7 shows the existing vegetation types throughout the marsh and bordering wetlands.

SHELLFISH AND BENTHIC INVERTEBRATES

Construction Effects

The project would have temporary adverse effects on shellfish and other benthic invertebrates during construction. Relatively immobile benthic organisms in the direct footprint of construction activities (e.g. the inlet channel) would be destroyed. However, larval and adult recruitment would quickly recolonize the disturbed benthic substrates. The surrounding benthic community would experience minor adverse effects due to potential slight increases in turbidity and suspended solids in the vicinity of the channel dredging, and possibly prior to the stabilization of the restored area.

The benthic community in the vicinity of the project consists of detritivores, predators, and suspension feeders. Suspension feeders, including shellfish, feed on materials suspended in the water column and are therefore affected by changes in turbidity. Suspension feeders are able to adjust to short term increases in suspended sediments by temporarily closing their feeding apparatus. When turbidity levels return to normal between short-term periods of soil disturbance, feeding resumes. Therefore, construction impacts to benthic invertebrates are anticipated to be of short duration and low intensity, and well within the tolerance range of benthic invertebrates.

Long Term Effects

The project would have permanent, positive effects on benthic resources. Benthic invertebrates and plants in the area of the inlet channel to be widened and deepened would be destroyed, but would completely recover after the completion of construction. Overall benthic invertebrates in the existing channel would experience a substantial improvement in habitat quality. Sampling conducted for this Environmental Assessment indicated that the number and diversity of benthic organisms declined substantially progressing upstream from Mount Hope Bay toward the railroad crossing of the inlet to Town Pond. The project would improve the quality of habitat in the channel and increase the diversity and abundance of benthic organisms

in the degraded upstream areas, which do not currently support estuarine benthic organisms.

The area of suitable habitat for estuarine benthic organisms would increase substantially with any of the restoration alternatives. The long-term effect of the project would be to increase the area of available benthic habitat and improve aquatic productivity and the quality of benthic resources. The increase in detrital export (a building block of estuarine communities) that results from the restoration of salt marsh is expected to increase the capacity of the area surrounding the site to support a productive benthic community, including shellfish.

No changes in salinity in Founder's Brook would occur with the project, so there would be no change to freshwater benthic communities.

FISH

Construction Effects

The project will have minor effects on finfish during construction. Since fish are mobile, they can avoid the relatively small area of increased turbidity that could result from construction. Fish that pass through the tidal inlet during construction may be exposed to higher turbidity levels as a result of soil disturbance during construction. However, the increase in turbidity is expected to be slight due to erosion control and construction sequencing. Most estuarine fish are tolerant of periodic increases in turbidity and can pass through areas of higher turbidity. There are no known anadromous fish runs at the project site.

Long Term Effects

The project would have positive long-term effects on fisheries. The overall quantity of estuarine aquatic habitat available to fish would increase. Fish that inhabit shallow estuaries such as mummichogs, silversides, and winter flounder would have additional habitat. In addition, the increase in estuarine productivity (e.g. detrital export) would benefit fish that feed directly on the detritus formed by the salt marsh and benthic organisms in the intertidal area. The improvement in aquatic productivity and populations lower in the food web would enhance the support of fish higher in the food web, including commercial fish.

The alternatives with permanent open water (i.e. Alternatives 3, 4a, and 4b) would have the greatest positive effect on fish communities due to the presence of permanent fish habitat.

Essential Fish Habitat

There would be essentially no impacts on Essential Fish Habitat from the project. Only the inlet to the former Town Pond provides estuarine fish habitat and changes to the inlet would be minor (deepening and reestablishing the historic outlet location). The project would provide additional habitat for listed species (e.g. winter flounder) if it were constructed.

WILDLIFE

Construction Effects

For all types of wildlife, there will be temporary disturbance of habitat during the estimated 8-month construction period. Some species may temporarily leave the area, but overall there would be a minor temporary decrease in the capacity to support wildlife populations during the construction time frame.

Long Term Effects

Effects of the project on particular wildlife species are summarized in Table 8. The quality of wildlife habitat is based on the interrelationship (juxtaposition and interspersion) between three key elements (food, cover, and water). Juxtaposition refers to the distribution between the requirements of a species (i.e., food, cover and water) in relation to each other and the area normally traveled by the species. Interspersion refers to the distribution of habitat components in relation to the habitat as a whole or the pattern of mixing of habitat types (King, 1938).

The relationship between habitat elements would change with the restoration project. As a result, there would be a change in the relative abundance of the various species of wildlife using the site. However, none of the vegetation types on the site would be completely eliminated, or reduced so significantly that the no longer provide habitat, as a result of the project, so all of the species presently using the site are expected to remain, although at different population levels.

In general, the change in the vegetation types and the relationship between vegetation types would improve. Phragmites, which primarily provides cover, would reduce in area, while salt marsh plant species, which provide food and limited cover, would increase in area. The increase in the area of salt marsh and pond would increase the forage area of the wetland improving the elements of juxtaposition and interspersion. Use of the site by some species associated with the phragmites components of the habitat may decline with the reduction in these habitat types; however, since cover is only one of the necessary components of the habitat, the overall quality of the habitat for even these species may improve.

Alternatives 5 and 6, which require on-site disposal and filling phragmites wetlands, would replace phragmites wetland with coastal grass communities.

Birds

The change from phragmites dominated marsh to salt marsh would result in an increase in bird species that nest and feed in or over the salt marsh and, potentially, a decrease in the species associated with phragmites habitats. The following species would probably increase in nesting and abundance: seaside sparrows, sharp-tailed sparrows, meadowlarks, black ducks, and Canada

geese. The following are examples of birds that would experience an increase in available feeding area: herons, egrets, ibis, gulls, and terns.

Even species such as the red-winged blackbird which nest in phragmites may increase in number as the relationship between the food and cover elements of the habitat changes. The decrease in cover habitat for these types of species is expected to be insignificant. Swallows, which roost in the marsh in concentration during fall migrations, would experience a decrease in vegetation suitable for roosting.

Mammals

Many of the mammals inhabiting Town Pond would benefit from the increase in feeding habitat available following restoration of estuarine habitat. Small mammals such as meadow voles and white-footed mice may experience a decrease in useable habitat area, but an increase in the quality of their foraging habitat. Larger mammals such as deer, raccoons, muskrats, skunks, otters, and mink would experience a decrease in available cover, but an increase in the quality of the feeding component. They are expected to experience overall positive impacts.

MOSQUITOES

The reestablishment of tidal flow and salt pond and salt marsh habitats would change the type of mosquitoes inhabiting the site from freshwater varieties to the more aggressive salt marsh mosquito. However, restoration of tidal flow would also enhance the ability of managers to manage the mosquito population and may result in an overall reduction in the number of mosquitoes. Furthermore, under all of the alternatives, the majority of the restored marsh would be composed predominantly of low salt marsh, intertidal flats, and salt pond, with a small proportion of high marsh. These habitats, which experience regular tidal flooding, do not produce mosquitoes.

Hellings and Gallagher (1992, *in* Nature Conservancy, 1993) indicated that the monitoring and control of mosquito breeding is nearly impossible in dense phragmites stands. Steinke (1987) indicated that when the town of Fairfield, Connecticut constructed a dike that restricted tidal flushing of a salt marsh, the State Mosquito Control Unit discontinued maintenance on mosquito ditches because it was impossible to maintain them without the flushing action of the tides. When phragmites moved in, even spraying of pesticides was stopped because of the lack of access in the dense stands. This led the State to describe the ditched and diked marshes as producing more mosquitoes than if the marshes were left in their original condition. Although affected by filling rather than diking, the Town Pond marsh is in a similar condition to the marsh described in Connecticut.

The state of Rhode Island will institute Open Marsh Water Management (OMWM) or other measures as needed to control mosquitoes once the estuarine habitat is restored. OMWM is a system for controlling mosquitoes where small ponds with permanent reservoirs are created to

provide habitat for mosquito-larvae-eating fish. The ponds are connected to other mosquito breeding depressions by radial level ditches (Payne, 1992). When the tide rises and floods mosquito breeding habitat, the larvae eating fish travel to the hatching sites and eat the larvae before they can transform to the adult phase. This technique can result in a 99% reduction in salt marsh mosquito populations (Capotosto, P.M., Connecticut Department of Environmental Protection, Wetlands Restoration Unit, pers. comm., February 1994). With OMWM the project is expected to result in an overall reduction in mosquitoes.

THREATENED AND ENDANGERED SPECIES

There are no Federally listed or proposed threatened or endangered species under the jurisdiction of the Fish and Wildlife Service known to exist at the project site with the exception of occasional, transient bald eagles (*Haliaeetus leucocephalus*) or perigrine falcons (*Falco peregrinusanatum*) (Correspondence dated February 25, 1999). Therefore, there would be no adverse impact on Federally listed threatened or endangered species from any project alternative.

The Rhode Island Natural Heritage Program has indicated that at the present time there are no state-listed threatened or endangered species utilizing the project site. Several species that are rare in the state of Rhode Island used the Town Pond area in the past. These include pied-billed grebe, common moorhen, green-winged teal, least bittern, marsh wren, and sora (Correspondence dated February 18, 1999). Therefore, there would be no adverse impact on state-listed threatened or endangered species from any project alternative.

WATER QUALITY

Construction Effects

On-site disposal meets the requirements for exclusion from testing of Section 230.60(c) of the Clean Water Act, Section 404(b)(1) Guidelines. The material would be disposed of either in dikes along various portions of the perimeter of the marsh, or in the southeast lobe of the marsh shown on Figure 1. In this case, the material would be disposed of on existing dredged material from the Fall River improvement dredging project. According to Section 230.6(c),

> Where the discharge site is adjacent to the extraction site and subject to the same sources of contaminants, and materials at the two sites are substantially similar, the fact that the material to be discharged may be a carrier of contaminants is not likely to result in degradation of the disposal site. In such circumstances, when dissolved material and suspended particulates can be controlled to prevent carrying pollutants to less contaminated areas, testing will not be required.

In the case of on-site disposal, the extraction site would be adjacent to the disposal site and pollutants could be maintained on-site by constructing upstream areas prior to establishing tidal flow. However, some sediment chemistry testing was performed for this project.

The sediment chemistry testing indicated that the material to be removed is very low in contaminants; therefore, the primary concern during construction would be the sediment suspension and turbidity increases. There may be a temporary short-term increase in turbidity and suspended solids in the vicinity of the project during construction and the initial restoration of tidal flow that could temporarily affect water quality. To minimize potential construction phase water quality impacts, excavation would be conducted behind a temporary berm of existing material. After the majority of grading is complete, the berm would be removed to create the connection to tidal water. Because the project would be constructed before tidal flooding is restored, impacts would be minor.

Long-Term Effects

The project is not expected to have any noticeable effects on water quality over the long term. Once the site is connected to tidal flow, it will be exposed to water quality similar to that near the entrance to Mount Hope Bay.

AIR QUALITY

The project would have no long-term impacts on air quality. During construction, equipment operating on the site would emit pollutants including nitrogen oxides that can lead to the formation of ozone. Rhode Island has no permit requirements for construction projects. In order to minimize air quality effects during construction, construction activities would comply with applicable provisions of the Rhode Island Air Quality Control Regulations pertaining to dust, odors, construction, noise, and motor vehicle emissions.

GROUNDWATER WELLS AND SEPTIC SYSTEMS

Construction of the project alternatives would increase tidal influence and could increase saltwater intrusion into nearby freshwater areas, including Founder's Brook. However, information indicates that the potential for saltwater intrusion into Founder's Brook and other nearby freshwater resources is low. Monitoring will be conducted to ensure that saltwater intrusion does not threaten freshwater ponds in the golf courses surrounding the project site. If the monitoring indicated that freshwater resources were threatened, appropriate action would be taken to avoid impacts to the freshwater resource.

FLOODING AND SALINITY CHANGES TO SURROUNDING FRESHWATER PONDS

The project would not increase flooding potential of surrounding developed areas. (See the

hydrology/hydraulics report (Appendix 2) for a more detailed evaluation.) The project features have been designed to avoid flooding Founders Brook and surrounding upland areas with salt water. Founders Brook borders the west side of Town Pond. Two features have been incorporated to avoid flooding Founders Brook and upland areas to the west of Town Pond. A broken flapgate on the end of a culvert at the outlet of Founders Brook will be replaced to preclude salt water from entering the brook. In addition, a permanent berm will be constructed between the restored marsh and Founders Brook. The height of the berm will be sufficient to prevent overtopping up to the 25-year flood elevation.

HISTORIC AND ARCHAEOLOGICAL RESOURCES

As the proposed project consists primarily of the restoration of former salt marsh in areas composed of dredged material from the Fall River Harbor navigation project, impacts to cultural resources are not expected. Deepening of the existing inlet from Mount Hope Bay, which crosses railroad tracks at the extreme northern end of the study area, is also unlikely to impact significant resources due to the waterlogged and disturbed context of the area.

Therefore, the proposed Town Pond restoration project will have no effect upon any structure or site of historic, architectural or archaeological significance as defined by the National Historic Preservation Act of 1966, as amended, and implementing regulations 36 CFR 800. The RI SHPO, in a letter dated April 12, 1999 has concurred with this determination.

RECREATION AND AESTHETICS

The project would improve the quality of recreational resources in the vicinity. The eisting prevalence of phragmites makes it difficult to use the site for recreational purposes. All of the project alternatives would produce a more open site improving its potential use for recreation. The improvement in the area and quality of estuarine resources will incrementally improve the quality of surrounding recreational and commercial fisheries due to improvements to fish habitat.

The reduction in the coverage of common reed in the marsh and its replacement with more open (pond and salt marsh) landscape types would improve the aesthetic value of the site and its value for passive recreational use such as bird watching.

A concern was expressed that the proposed project could increase the "rotten egg" odor sometimes associated with salt marshes. Hydrogen sulfide odor occurs when bottom deposits within an estuarine system release compounds containing sulfide. There is little oxygen below the surface layers of the sediment so organic material is decomposed by anaerobic (without oxygen) bacteria. These bacteria use sulfates rather than oxygen for their metabolic processes creating hydrogen sulfide and other sulfide compounds. Sulfides are converted to less odorous compounds in the aerobic portion of the marsh sediments and aerobic water. Where there is excessive buildup of organic material or poor flushing, anaerobic decomposition is more

prevalent and an odor problem can occur. Disruption of flushing can contribute to the buildup of sulfides and associated odors (Bella, 1977).

Teal and Teal (1969) indicated that sick marshes may have a hydrogen sulfide odor, but that this odor is very faint in a healthy marsh. Since the proposed project will improve flushing of the marsh system and oxygenation of the sediments, it is not expected to increase hydrogen sulfide odors over the long term. However, a temporary increase in the release of free sulfides can occur when bottom deposits are physically disturbed (Bella, 1977); therefore, there may be an increase in hydrogen sulfide odor during construction.

TRAFFIC

If off-site disposal of excavated material is implemented, the project would temporarily increase traffic during the construction period. As shown below in Table X, removal of all of the excavated material would require 4,000 to 10,000 dump truck trips (assuming 10% bulking of the material during excavation) to the Tiverton Landfill, Sachuest Point National Wildlife Refuge site, or other off-site disposal area. Trucks would access the Tiverton Landfill disposal site following an 8-mile haul route. Trucks would follow Route 24 across the Sakonnet Bridge to Route 77 in Tiverton to the entrance road to the landfill. Access to the Sachuest Point site would follow Route 138 to, then follow local roads for a 10-mile one-way trip.

Table 8. Dump Truck Trips for Restoration Alternatives

Alternative	Cubic Yards Removed from Site	Dump Truck Capacity	
		18-cy	25-cy
2	86,700	5,300	3,820
3	141,400	8,640	6,220
4a	132,400	8,090	5,825
4b	159,200	9,730	7,000

ENVIRONMENTAL JUSTICE AND PROTECTION OF CHILDREN

The project would not have a significant impact on a minority or low-income population or any other population in the United States. According to the 2000 census, 91.5% of the population of Newport County where the project is located is composed of white persons. More importantly, the potential adverse impacts of the project are minor.

The project would not create a disproportionate environmental health or safety risk for children. The project area is not contaminated, nor is it located in an area that is particularly

disproportionately used by children.

SECTION VII - SUSTAINABLE DEVELOPMENT; ACTIONS TAKEN TO MINIMIZE ADVERSE EFFECTS ENVIRONMENTAL IMPACTS

SUSTAINABLE DEVELOPMENT

Since this is an environmental restoration project, it involves changes to existing development (the marsh which is a former disposal site) to improve the quality of the environment. The restoration project itself is sustainable development in terms of its environmental effects since it would improve the quality of aquatic resources it affects.

ACTIONS TO MINIMIZE ADVERSE EFFECTS ON THE ENVIRONMENT

A number of design and construction requirements have been made to minimize adverse effects on the environment. Those factors requiring specific actions in later project phases are highlighted in this section.

The project has been designed to ensure that tidal water entering the site will not impact developed uplands. The outlet from Founder's will be equipped with a flap gate to exclude salt water from this freshwater resource. A berm will be constructed along the west side of the project to prevent salt water from entering Founder's Brook or increase flood potential of surrounding uplands.

The on-site disposal areas will be hydroseeded with an erosion control mixture containing switchgrass (*Panicum virgatum*) and other suitable grasses.

To minimize potential construction phase water quality impacts, the project south of the railroad embankment will be constructed behind a low cofferdam prior to modifying the inlet and completely restoring tidal exchange. This will limit the potential for water quality effects during construction. The wetland or water side of work staging areas and piles of excavated material outside the grading area will be surrounded by erosion control devices.

Mosquito control will be implemented as needed by the local sponsor to ensure that the restoration of tidal flow does not increase mosquito populations.

MONITORING

The Corps will establish approximately ten permanent sample stations along transects through the restored marsh to record the following:

- the surface elevation,
- depth of flooding relative to surface elevation at high and low water during

spring and mean tide phases,

- plant species composition, percent cover, and maximum height of each species of plant.

Sampling will be conducted immediately following implementation, and during August of each of the three years following implementation.

SECTION VII - AGENCIES, INTERESTED GROUPS AND THE PUBLIC CONSULTED

U.S. Fish and Wildlife Service
National Marine Fisheries Service
Environmental Protection Agency
RI Department of Environmental Management
RI Coastal Resources Management Council
Town of Portsmouth
Save The Bay
Aquidneck Island Land Trust
Abutters

(See Appendix EA-A – Pertinent Correspondence.)

SECTION IX - REFERENCES

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Table 6. Predicted Changes in Wildlife Use as a Result of Restoring Salt Marsh and Estuarine Habitat at Town Pond. "+" indicates an increase in habitat value or positive effect on wildlife populations; "-" indicates a decrease in habitat value or negative effect on wildlife populations; "N" indicates a negligible change; and "NA" indicates that the species does not use the Town Pond area for the activity listed and is not expected to use the site after the restoration project. The signs do not indicate that the animal will use the site. They indicate whether the change in habitat would benefit the species if it does use the site.

	BIRDS			
	Nesting	**Feeding**	**Resting**	**Overall**
Perching birds				
Red-winged blackbird[1,2,4]	-	+	-	N
Common yellowthroat[1,2]	+	+	+	+
Yellow warbler[1]	N	N	N	N
Song sparrow[1,2]	+	+	-	+
Willow flychatcher[1]	-	N	-	-
Gray catbird[1,2]	+	+	-	+
Sharp-tailed sparrow[1,2]	+	+	+	+
American robin[4]	N	N	N	N
European starling[1]	N	N	N	N
House finch[1]	N	N	N	N
American goldfinch[1,4]	N	N	N	N
Cedar waxwing[1]	N	N	N	N
Common grackle[1]	N	+	N	+
Swamp sparrow[1]	N	-	-	-
Northern cardinal[1]	N	N	N	N
Rufous-sided towhee[1]	N	N	-	-
Purple finch[1]	N	N	N	N
Mourning dove[1,4]	N	N	N	N
Black-billed cuckoo[1]	N	N	N	N
Carolina wren[1]	-	-	-	-
Marsh wren[1,2,6]	+	+	+	+
Black-capped chickadee[1]	N	N	N	N
Eastern phoebe[1]	N	N	N	N
Red-eyed vireo[1]	N	N	N	N
Yellow-rumped warbler[1]	N	+	+	+
American tree sparrow[1]	NA	N	N	N
Seaside sparrow[1,2]	+	+	+	+
Meadowlark[2]	+	+	+	+
Savannah sparrow[2]	+	+	-	+
Kingbird[2]	+	+	+	+
Grackle[2]	N	+	-	+
Swallow[2,4]	N	-	-	-
Chimney swift[2]	N	-	-	-

Belted kingfisher[4]	N	+	+	+

	Nesting	Feeding	Resting	Overall
Shorebirds				
Semipalmated sandpiper[1]	NA	+	+	+
Black-bellied plover[1]	NA	+	+	+
Sanderling[1]	NA	N	N	N
Dunlin[1]	NA	+	+	+
Killdeer[1]	N	+	+	+
Willet[2]	+	+	+	+
American oystercatcher[5]	N	+	+	+
Ruddy turnstone[5]	NA	+	+	+
Semipalmated plover[5]	NA	+	+	+
Piping plover[5]	NA	+	N	N
Short-billed dowitcher[5]	NA	+	+	+
Long-billed dowitcher[5]	NA	+	+	+
Greater yellowlegs[5]	NA	+	+	+
Lesser yellowlegs[5]	NA	+	+	+
Stilt sandpiper[5]	NA	+	+	+
Red knot[5]	NA	+	+	+
Pectoral sandpiper[5]	NA	+	+	+
Spotted sandpiper[5]	NA	+	+	+
Purple sandpiper[5]	NA	N	+	N
Least sandpiper[5]	NA	+	+	+
Western sandpiper[5]	NA	+	+	+
White-rumped sandpiper[5]	NA	+	+	+
Hudsonian godwit[5]	NA	N	N	N
Marbled godwit[5]	NA	+	+	+
Sora[6]	N	N	N	N

	Nesting	Feeding	Resting	Overall
Diving Birds				
Pied-billed grebe[6]	+	+	+	+
Common moorhen[6]	+	+	+	+
Double-crested cormorant	+	+	+	+
Waterfowl				
American black duck[1,2,4]	+	+	+	+
Mallard[1,4]	+	+	+	+
Canada goose[1,2]	+	+	+	+
Atlantic brant[4]	NA	+	+	+

Blue-winged teal[2]	+	+	+	+
Green-winged teal[3,6]	+	+	+	+
Lesser scaup	NA	+	+	+
Common pintail	NA	+	+	+
American widgeon[1]	NA	+	+	+
Hooded merganser[1]	N	+	+	+
Red-brested merganser[1]	NA	+	+	+
Gadwall[1]	+	+	+	+
Bufflehead[1]	NA	+	+	+
Mute swan[1,4]	+	N	+	+
Wading birds				
Great blue heron[1,4]	NA	+	+	+
Great egret[1,4]	NA	+	+	+
Snowy egret[1]	NA	+	+	+
Green-backed heron[3]	N	+	+	+
Black-crowned night heron[1]	NA	+	+	+
Yellow-crowned night heron[1]	N	+	+	+
Glossy ibis[2]	NA	+	+	+
American bittern[1]	N	+	N	N
Least bittern[6]	N	N	N	N
Virginia rail[1,4]	-	+	+	+
Clapper rail[2]	+	+	+	+
Gulls and Terns				
Herring gull[1]	NA	+	+	+
Great black-backed gull[1]	NA	+	+	+
Terns[2]	+	+	+	+
Raptors				
Northern harrier[1,2]	NA	+	N	+
Short-eared owl[2]	NA	+	+	+
Snowy owl	NA	+	+	+

MAMMALS

	Cover	Food	Overall
River otter[3,4]	-	+	+
Mink[2,3,4]	-	+	+
Long-tailed weasel[3]	N	+	+
Red fox[3,4]	N	+	N
Gray fox[3,4]	-	+	N
White-tailed deer[3]	-	+	N
Muskrat[2,3,4]	-	+	+
Raccoon[2,3,4]	-	+	+
Meadow jumping mouse[2]	-	+	N
Meadow vole[2,3]	N	+	+
Star-nosed mole[3]	-	-	N
Virginia opposum[3]	N	N	N
Masked shrew[2]	N	N	N
Short-tailed shrew[3]	N	N	N
Big brown bat[3]	N	-	-
House mouse[2,3]	N	+	N
Norway rat[3]	N	N	N
Striped skunk[2,3,4]	N	+	+

REPTILES AND AMPHIBIANS

	Cover	Food	Overall
Painted turtle[3]	-	-	-
Spotted turtle[3,4]	-	-	-
Snapping turtle[3,4]	-	-	N
Diamondback terrapin[3]	NA(+)	NA(+)	NA
Northern watersnake[3]	N	N	N
Salamanders[3]	-	-	N
Frogs[3]	-	-	N

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[3] - Odum, W.E., T.J. Smith III, J.K. Hoover, and C.C. McIvor. 1984. The ecology of tidal freshwater marshes of the United States east coast: a community profile. U.S. Fish and Wildlife Service. FWS/OBS-83/17. 177pp.

[4] - Reported or observed on-site.

[5] - Whitlatch, R.B. 1982. The ecology of New England tidal flats: a community profile. FWS/OBS-81/01. U.S. Fish and Wildlife Service. Office of Biological Services, Washington, D.C. 125 pp.

[6] – Enser, R.W. 1999. Correspondence from the Rhode Island Natural Heritage Program listing species rare in the state of Rhode Island that historically were present at or near Town Pond.

APPENDIX EA-C
SEDIMENT CHEMISTRY TESTING RESULTS

APPENDIX EA-A
PERTINENT CORRESPONDENCE

APPENDIX EA-B
BENTHIC INVERTEBRATE SAMPLING RESULTS

APPENDIX EA-D
ECOLOGICAL DESIGN CRITERIA

FINDING OF NO SIGNIFICANT IMPACT
TOWN POND RESTORATION, SECTION 1135 PROJECT
(FONSI)

After careful consideration of the information presented in the Environmental Assessment (EA), it is my conclusion that implementation of the proposed project is in the best overall public interest. Implementation of the proposed project would not require a significant commitment of physical, natural, or human resources.

Points considered include the effects of grading the former disposal site to elevations that will support estuarine habitats, disposal of dredged/excavated material, construction of a water control berm, and installation of water control structures to protect freshwater resources.

Dredged material placed on the project site in the early 1950's changed the preexisting estuarine salt pond and salt marsh habitats to common reed or *Phragmites* marsh, which has lower ecological value. The project would restore much of the former ecological value of the site by reestablishing estuarine habitats.

This action will restore approximately 15 acres of estuarine habitat. The selected alternative (Alternative 3) would restore the majority of the site to a combination of about half salt marsh and half salt pond. The existing dredged material will be excavated to elevations that will support high salt marsh, low salt marsh, mudflats, and salt pond. A weir at the entrance to the marsh near the railroad tracks that cross Founder's Brook will maintain open water over a portion of the site.

In my evaluation, this EA has been prepared in accordance with the National Environmental Policy Act of 1969. The determination that an Environmental Impact Statement is not required is based on the following considerations:

1. The proposed plan will result in a substantial net gain in wetland functions and values and area of estuarine habitat, including areas considered Special Aquatic Sites under the Clean Water Act (CWA), Section 404 (b)(1) Guidelines.

2. The proposed plan will not adversely affect any threatened or endangered species or cultural resources, nor violate any other Federal environmental laws, regulations, or executive orders.

3. A CWA Section 404 (b)(1) Evaluation prepared for this project indicates that impacts to Special Aquatic Sites have been minimized to the maximum extent practicable. Both Water Quality Certification and Coastal Zone Management Consistency Concurrence will be obtained.

4. Impacts associated with the proposed work include filling of 10.6 acres of common reed or *Phragmites* marsh to dispose of dredged material excavated from the site. Other minor impacts include construction-related disturbance effects, minor increases in turbidity, and habitat change, but overall the project will have substantial positive net ecological effects.

5. Potential impacts will be minimized to the maximum extent possible.

6. The project will not cause significant secondary or cumulative impacts. It will not increase flooding potential of surrounding residential areas, change the salinity of surrounding groundwater resources, nor increase mosquito production.

7. Coordination with appropriate Federal, State, and local agencies insured that concerns and suggestions were made known to the Corps of Engineers so that these items could be addressed during project planning.

Based on my review and evaluation of the environmental effects as presented in the EA, I have determined that the proposed Section 1135, Environmental Restoration Project at Town Pond in Portsmouth, Rhode Island is not a major federal action significantly affecting the quality of the human environment. This project is therefore exempt from requirements to prepare an Environmental Impact Statement.

_____ _____

Date

Thomas L. Koning
Colonel, Corps of Engineers
District Engineer

IX. COMPLIANCE WITH ENVIRONMENTAL FEDERAL STATUTES AND EXECUTIVE ORDERS

Federal Statutes

1. Archaeological Resources Protection Act of 1979, as amended, 16 USC 470 et seq.

Compliance: Issuance of a permit from the Federal land manager to excavate or remove archaeological resources located on public or Indian lands signifies compliance.

2. Preservation of Historic and Archeological Data Act of 1974, as amended, 16 U.S.C. 469 et seq.

Compliance: Project has been coordinated with the State Historic Preservation officer. No impacts to archaeological resources are anticipated.

3. American Indian Religious Freedom Act of 1978, 42 U.S.C. 1996.

Compliance: The project will not impede access by native Americans to sacred sites, possession of sacred objects, and the freedom to worship through ceremonials and traditional rites.

4. Clean Air Act, as amended, 42 U.S.C. 7401 et seq.

Compliance: Public notice of the availability of this report to the Environmental Protection Agency has been provided for compliance pursuant to Sections 176c and 309 of the Clean Air Act.

5. Clean Water Act of 1977 (Federal Water Pollution Control Act Amendments of 1972) 33 U.S.C. 1251 et seq.

Compliance: A Section 404(b)(1) Evaluation and Compliance Review have been incorporated into the project report. An application shall be filed for State Water Quality Certification pursuant to Section 401 of the Clean Water Act.

6. Coastal Zone Management Act of 1782, as amended, 16 U.S.C. 1451 et seq.

Compliance: A CZM consistency determination shall be provided to the State for review and concurrence that the proposed project is consistent with the approved State CZM program.

7. Endangered Species Act of 1973, as amended, 16 U.S.C. 1531 et seq.

Compliance: Coordination with the U.S. Fish and Wildlife Service (FWS) and/or National Marine Fisheries Service (NMFS) has determined that there are no formal consultation requirements pursuant to Section 7 of the Endangered Species Act.

8. Estuarine Areas Act, 16 U.S.C. 1221 et seq.

Compliance: Not applicable; report is not being submitted to Congress.

9. Federal Water Project Recreation Act, as amended, 16 U.S.C. 4601-12 et seq.

Compliance: Public notice of availability to the project report to the National Park Service (NPS) and Office of Statewide Planning relative to the Federal and State comprehensive outdoor recreation plans signifies compliance with this Act.

10. Fish and Wildlife Coordination Act, as amended, 16 U.S.C. 661 et seq.

Compliance: Coordination with the FWS, NMFS, and State fish and wildlife agencies signifies compliance with the Fish and Wildlife Coordination Act.

11. Land and Water Conservation Fund Act of 1965, as amended, 16 U.S.C. 4601-4 et seq.

Compliance: Public notice of the availability of this report to the National Park Service (NPS) and the Office of Statewide Planning relative to the Federal and State comprehensive outdoor recreation plans signifies compliance with this Act.

12. Marine Protection, Research, and Sanctuaries Act of 1971, as amended, 33 U.S.C. 1401 et seq.

Compliance: Not applicable. The project does not involve the transportation or disposal of dredged material in ocean waters pursuant to Sections 102 and 103 of the Act, respectively.

13. National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470 et seq.

Compliance: Coordination with the State Historic Preservation Office signifies compliance.

14. Native American Graves Protection and Repatriation Act (NAGPRA), 25 U.S.C. 3000-3013, 18 U.S.C. 1170

Compliance: Regulations implementing NAGPRA will be followed if discovery of human remains and/or funerary items occur during implementation of this project.

15. National Environmental Policy Act of 1969, as amended, 42 U.S.C 4321 et seq.

Compliance: Preparation of an Environmental Assessment signifies partial compliance with NEPA. Full compliance shall be noted at the time the Finding of No Significant Impact or Record of Decision is issued.

16. Rivers and Harbors Act of 1899, as amended, 33 U.S.C. 401 et seq.

Compliance: No requirements for projects or programs authorized by Congress. The proposed aquatic ecosystem restoration project is being conducted pursuant to the Congressionally-approved authority.

17. Watershed Protection and Flood Prevention Act as amended, 16 U.S.C 1001 et seq.

Compliance: Floodplain impacts have been considered in project planning.

18. Wild and Scenic Rivers Act, as amended, 16 U.S.C 1271 et seq.

Compliance: The project site does not contain Wild and Scenic Rivers.

19. Magnuson-Stevens Act, as amended, 16 U.S.C. 1801 et seq.

Compliance: Coordination with the National Marine Fisheries Service and preparation of an Essential Fish Habitat (EFH) Assessment signifies compliance with the EFH provisions of the Magnuson-Stevens Act.

Executive Orders

1. Executive Order 11593, Protection and Enhancement of the Cultural Environment, 13 May 1971

Compliance: Coordination with the State Historic Preservation Officer signifies compliance.

2. Executive Order 11988, Floodplain Management, 24 May 1977 amended by Executive Order 12148, 20 July 1979.

Compliance: Public notice of the availability of this report or public review fulfills the requirements of Executive Order 11988, Section 2(a)(2).

3. Executive Order 11990, Protection of Wetlands, 24 May 1977.

Compliance: Public notice of the availability if this report for public review fulfills the requirements of Executive Order 11990, Section 2 (b).

4. Executive Order 12114, Environmental Effects Abroad of Major Federal Actions, 4 January 1979.

Compliance: Not applicable to projects located within the United States.

5. Executive Order 12898, Environmental Justice, 11 February 1994.

Compliance: The project is not expected to have a significant impact on minority or low income population, or any other population in the United States.

6. Executive 13007, Accommodation of Sacred Sites, 24 May 1996

Compliance: Not applicable on non-Federal lands.

7. Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks. 21 April, 1997.

Compliance: The project would not create a disproportionate environmental health or safety risk for children.

8. Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, 6 November 2000.

Compliance: Consultation with Indian Tribal Governments, where applicable, and consistent with executive memoranda, DoD Indian policy, and USACE Tribal Policy Principles signifies compliance.

Executive Memorandum

Analysis of Impacts on Prime or Unique Agricultural Lands in Implementing NEPA, 11 August 1980.

Compliance: Not applicable. The project does not involve or impact agricultural lands.

White House Memorandum, Government-to-Government Relations with Indian Tribes, 29 April 1994.

Compliance: Consultation with Federally Recognized Indian Tribes, through a public notice, signifies compliance.

NEW ENGLAND DISTRICT
U.S. ARMY CORPS OF ENGINEERS, CONCORD, MA

CLEAN WATER ACT

SECTION 404 (b)(1) EVALUATION

PROJECT: Town Pond Estuarine habitat Restoration Project, Portsmouth, Rhode Island.

PROJECT MANAGER: David Larsen TEL. 978-318-8113

FORM COMPLETED BY: Lawrence Oliver TEL. 978-318-8347

PROJECT DESCRIPTION:

The recommended alternative for this project is described in detail in Part IV of the Project Modification Report. In general, the proposed plan involves grading the existing marsh to elevations that will support a combination of salt marsh and non-vegetated intertidal flats and subtidal pond habitats. The low marsh generally between 0.4 to 2.7 feet NGVD will be planted with salt marsh cordgrass plants during the spring after sufficient time has elapsed after tidal exchange has been restored to determine the areas that have the correct tidal regime. Alternative 6 has unavoidable on-site disposal in phragmites wetlands and would require approximately 10.6 acres of wetland fill. The disposal area will be seeded with coastal grasses (e.g. switchgrass) after construction is complete to create a coastal grass community.

The recommended alternative (Alternative 6) would restore about half salt marsh and half open water. The existing dredged material would be excavated to elevation 2.9 ft (0.88 m) along the inland edge of the project area and slope at 1 percent toward the interior of the marsh for a width of 16 ft (5 m). From 16 ft (5 m) out, the slope would change to 1:10 for 33 ft (10 m) of width for most of the perimeter. Areas of wider salt marsh would slope from elevation 2.7 ft (8.3 m) to the edge shown at variable slopes between 1 to 10 percent. The remainder of the site would slope to the centerline invert at a constant slope (based on distance). The main channel would have an invert sloping from –2 ft (-0.6 m) at Mount Hope Bay to –1.3 ft (-0.4 m) at the railroad bridge. The centerline invert of the restored pond upstream of the railroad bridge would slope from –3.3 ft (-1.00 m) at the bridge to –2.0 ft (-0.60 m) at the upstream end. A weir with a top elevation of -0.2 ft (-0.06 m) would maintain open water depths between 1.8 to 3.1 ft (0.54 to 0.94 m) deep with a median depth at the halfway point of 2.4 ft (0.74 m). Upstream of the railroad bridge there would be no channel.

High marsh would be located between elevation 2.7 to 2.9 ft (0.88 m to 0.83 m) for a width of 16 ft (5 m) on the 1:100 slope. Low marsh would occur between elevation 0.46 to 2.7 ft (0.14 to 0.83 m) on a variable slope for an area of approximately 9 acres. Mudflat would occur between the lower limit of low marsh (0.46 ft; 0.14 m) and the upper edge of the open water (-0.2 ft; -0.06 m). The water surface elevation would be controlled by a weir placed just upstream of the culvert that runs parallel to the railroad bed to maintain permanent open water. The crest of the weir would be placed at –0.2 ft (-0.06 m) to create a low water elevation 8 inches (20 cm) below the lowest elevation of salt marsh to avoid waterlogged soil conditions. The weir would allow periodic flushing of the system if needed and would allow minor adjustments to water levels to be made easily. There would be 2.33 acres (0.95 hectares) of high marsh, 4.48 acres (1.81 hectares) of low marsh, 2.98 acres (1.20 hectares) of mudflats, and 5.37 acres (2.17 hectares) of permanent open water. A weir with a top elevation of -0.2 ft (-0.06 m) would maintain permanent open water depths between 0.2 to 2.9 ft (0.54 to 0.88 m) deep with a median depth at the halfway point of 2.3 ft (0.71 m).

Alternative 3, which avoids much of the on-site disposal in wetlands, will be implemented if an off-site disposal site is found to be available and practicable to use.

1. Review of Compliance (Section 230.10(a)-(d)).

		YES	NO
a.	The discharge represents the least environmentally damaging practicable alternative and if in a special aquatic site, the activity associated with the discharge must have direct access or proximity to, or be located in the aquatic ecosystem to fulfill its basic purpose.	X	
b.	The activity does not appear to: 1) violate applicable state water quality standards or effluent standards prohibited under Section 307 of the CWA; 2) jeopardize the existence of Federally listed threatened and endangered species or their habitat; and 3) violate requirements of any Federally designated marine sanctuary.	X	
c.	The activity will not cause or contribute to significant degradation of waters of the U.S. including adverse effects on human health, life stages of organisms dependent on the aquatic ecosystem, ecosystem diversity, productivity and stability, and recreational, aesthetic, and economic values.	X	
d.	Appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem.	X	

2. Technical Evaluation Factors (Subparts C-F).

		N/A	Not Significant	Significant
a.	Potential Impacts on Physical and Chemical Characteristics of the Aquatic Ecosystem (Subpart C)			
	1) Substrate		X	
	2) Suspended particulates/turbidity		X	
	3) Water column impacts		X	
	4) Current patterns and water circulation		X	
	5) Normal water fluctuations		X	
	6) Salinity gradients		X	
b.	Potential Impacts on Biological Characteristics of the Aquatic Ecosystem (Subpart D)			
	1) Threatened and endangered species	X		
	2) Fish, crustaceans, mollusks, and other organisms in the aquatic food web		X	
	3) Other wildlife (mammals, birds, reptiles and amphibians)		X	
c.	Potential Impacts on Special Aquatic Sites (Subpart E).			
	1) Sanctuaries and refuges	X		
	2) Wetlands		X	
	3) Mud flats		X	
	4) Vegetated shallows	X		
	5) Coral reefs	X		
	6) Riffle and pool complexes	X		
d.	Potential Effects on Human Use Characteristics (Subpart F).			
	1) Municipal and private water supplies	X		

		N/A	Not Significant	Significant
	2) Recreational and commercial fisheries		X	
	3) Water-related recreation		X	
	4) Aesthetics impacts		X	
	5) Parks, national and historic monuments,national seashores, wilderness areas, research sites and similar preserves		X	

3. Evaluation and Testing (Subpart G).

a.	The following information has been considered in evaluating the biological availability of possible contaminants in dredged or fill material. (Check only those appropriate.)		
	1) Physical characteristics		X
	2) Hydrography in relation to known or anticipated sources of contaminants		X
	3) Results from previous testing of the material or similar material in the vicinity of the project		X
	4) Known, significant sources of persistent pesticides from land runoff or percolation		X
	5) Spill records for petroleum products or designated hazardous substances (Section 311 of CWA)		
	6) Public records of significant introduction of contaminants from industries, municipalities, or other sources.		
	7) Known existence of substantial material deposits of substances which could be released in harmful quantities to the aquatic environment by man-induced discharge activities		
	8) Other sources (specify)		
	List appropriate references. See Environmental Assessment.		
		YES	NO
b.	An evaluation of the appropriate information in 3a above indicates that there is reason to believe the proposed dredged material is not a carrier of contaminants, or that levels of contaminants are substantively similar at extraction and disposal sites and not likely to require constraints.	X	

4. Disposal Site Delineation (Section 230.11(f)).

a.	The following information has been considered in evaluating the biological availability of possible contaminants in dredged or fill material. (Check only those appropriate.)	
	1) Depth of water at disposal site	X
	2) Current velocity, direction, variability at disposal site	X
	3) Degree of turbulence	X
	4) Water column stratification	
	5) Discharge vessel speed and direction	
	6) Rate of discharge	X
	7) Dredged material characteristics (constituents, amount, and type of material, settling velocities)	X
	8) Number of discharges per unit of time	

	9) Other factors affecting rates and patterns of mixing (specify)		
	List appropriate references. See Environmental Assessment.		
		YES	NO
b.	An evaluation of the appropriate information factors in 4a above indicated that the disposal sites and/or size of mixing zone are acceptable.	X	

5. Actions to Minimize Adverse Effects (Subpart H).

	YES	NO
All appropriate and practicable steps have been taken, through application of recommendation of Section 230.70-230.77 to ensure minimal adverse effects of the proposed discharge.	X	

List actions taken.

The disposal site and water control berm are confined to the smallest practicable area to minimize smothering of organisms (230.70a).

The water control berm and disposal site will be constructed at the upland storage/dewatering facilities to reduce erosion (230.72a1).

Using planning and construction practices to institute habitat development and restoration to produce a new or modified environmental state of higher ecological value by displacement of some or all of the existing environmental characteristics (230.75d).

The following actions will be taken to minimize adverse impacts to the biological resources within the projects area:

The project site will not be connected to tidal water until construction of project features is complete.

6. Factual Determination (Section 230.11).

A review of appropriate information, as identified in Items 2 – 5 above, indicates there is minimal potential for short or long term environmental effects of the proposed discharge as related to:			
		YES	NO
a.	Physical substrate at the disposal site (review Sections 2a, 3, 4, and 5 above)	X	
b.	Water circulation, fluctuation and salinity (review Sections 2a, 3, 4, and 5)	X	
c.	Suspended particulates/turbidity (review Sections 2a, 3, 4 and 5)	X	
d.	Contaminant availability (review Sections 2a, 3, and 4)	X	
e.	Aquatic ecosystem structure, function and organisms (review Sections 2b and 2c, 3, and 5)	X	
f.	Proposed disposal site (review Sections 2, 4, and 5)	X	
g.	Cumulative effects on the aquatic ecosystem	X	
h.	Secondary effects on the aquatic ecosystem	X	

7. Findings of Compliance or Non-compliance

	YES	NO
The proposed disposal site for discharge of dredged or fill material complies with the Section 404(b)(1) guidelines.	X	

24 JUL 02

Date

Thomas L. Koning
Colonel, Corps of Engineers
District Engineer

APPENDIX EA-A
PERTINENT CORRESPONDENCE

DEPARTMENT OF THE ARMY
NORTH ATLANTIC DIVISION, CORPS OF ENGINEERS
FORT HAMILTON MILITARY COMMUNITY
BUILDING 301
BROOKLYN,NY 11252

IN REPLY REFER TO

CENAD-CM-PP (1105-2-1150A) 17 May 2002

MEMORANDUM FOR COMMANDER, New England District, CENAE-EP-P

SUBJECT: Final Detailed Project Report, Town Pond (Boyd's Marsh), Portsmouth, RI, Section 1135, PWI 096188

1. In accordance with EC 1105-2-217, para. 8 b, and ER 1105-2-100, para. F-11, Approval Authorities, the subject report, Town Pond Restoration is approved and efforts may begin for the preparation of Plans and Specifications.

2. The Detailed Project Report evaluated several alternatives to restore the Town Pond area to the historical ecological conditions that existed prior to the Federal navigation improvement project that resulted in the placing of dredged material in the area in the early 1950's. The recommended plan is to restore a combination of fifty-percent salt marsh – fifty percent open water/intertidal habitats with on-site disposal of excavated material. An estimated 99,800 cubic yards of existing dredged material would be excavated to promote tidal exchange to Town Pond. There would be 2.33 acres of high marsh, 4.48 acres of low marsh, 2.98 acres of mudflats, and 5.37 acres of permanent open water. A weir would maintain permanent open water depths between 2.88 ft to 1.77 ft. deep. Over time, the interior marsh will be transformed from a lower value brackish habitat to a high value salt pond and salt marsh habitat. Project implementation provides for a net gain of 15 acres of estuarine habitat. Material excavated to restore the salt marsh and salt pond habitats will be placed on Phragmites marsh on the project site because there are no practicable off-site disposal alternatives.

3. The cost of the project is $2,551,000. The non-Federal sponsor, Rhode Island Department of Environmental Management, concurs with the recommendations of the ERR and intends to sign the negotiated Project Cooperation Agreement and is responsible for 25% of the cost of the project including the value of LERRD's and 100% of the cost for operation and maintenance of the project.

Samuel P Tosi

Encl

SAMUEL P. TOSI, P.E.
Chief, Planning and Policy Division
Civil Works & Management Directorate

CENAE-EP-VE

7 February 2002
Mr. Oliver/78347

MEMORANDUM FOR THE RECORD

SUBJECT: Meeting of the U.S. Fish and Wildlife Service, RI Department of Environmental Management (RIDEM), and the Corps of Engineers to discuss the Town Pond Final Coordination Act Report (FCAR) and Monitoring Plan

1. **DATE OF MEETING**: 24 January 2002

2. **LOCATION**: RIDEM Headquarters, Providence, RI

3. **PARTICIPANTS**: Greg Mannesto – U. S. Fish and Wildlife Service (USFWS)
Tom Ardito – RIDEM
Terry Walsh – RIDEM
David Larsen – Corps of Engineers
Larry Oliver - Corps of Engineers

4. **REPORT**: The purpose of the meeting was to discuss the FCAR dated January 3, 2002 and the draft monitoring plan for the Town Pond Restoration Project.

We discussed the need to place excavated material on-site and the alternatives we considered to avoid placing the material on-site. Mr. Mannesto asked that we contact Roger Williams University, which owns the property along the southeast corner of the site to ask whether we could place the material there. (Subsequent to the meeting, we contacted the university and determined that their development plans for the area would not be consistent with placing the material on their property.) We discussed the relationship among the height and position of the berm and disposal site and the size of the material storage area. We concluded that it is necessary to place the material on-site generally as configured in the plan outlined in the feasibility report and agreed to continue to work to minimize the size of the disposal site and viewing area to maximize the restoration area.

We discussed the methods used to estimate the elevations of various habitat types in the restoration area and the ratio of high marsh to low marsh in the plan. We concluded that we should explore providing additional high marsh in the finger of marsh at the northeast corner of the site and in the expanded areas of restored marsh near the viewing area at the southern end of the marsh.

We also discussed the channel north of the railroad bed and indicated that we would explore creating channels into the *Phragmites* areas surrounding this channel.

We agreed that we would review the draft plans with the USFWS once they are available.

Finally, we discussed the draft monitoring plan and agreed to changes, including monitoring during years two, three, and five following construction, rather than one, two, and three, and apportioning salt marsh samples between high marsh and low marsh.

5. IMPORTANCE OF THE MEETING: This meeting allowed us to discuss the USFWS letter and monitoring for the Project.

Lawrence R Oliver

LAWRENCE R. OLIVER
New England District, Corps of Engineers

CF:
Oliver
Hubbard
Larsen
Mannesto
Ardito
Walsh

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

235 Promenade Street, Providence, RI 02908-5767 TDD 401-831-5508

February 5, 2002

Mr. David Larsen
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA

Re: Boyd's Marsh Restoration Project
WQC File No. 99-02

Dear Mr. Larsen:

The RIDEM, Office of Water Resources, has reviewed the draft Environmental Assessment for the subject project and the supplemental information submitted on January 9, 2002 by Larry Oliver in response to comments on the alternatives analysis that we discussed at our meeting last December.

Our conclusion is that the project on the whole will result in significant restoration of important salt marsh habitat. Although there will be loss of some existing wetland habitat, the resulting impacts are felt to be limited in scope and of short-term duration. The project is expected to result in improvement in coastal wetland habitat that will contribute positively to water quality objectives in this area of Mount Hope Bay. Accordingly, it is our opinion that the project as proposed will comply with state water quality standards.

Attached herewith is a memorandum from Brian Tefft, Principal Wildlife Biologist of DEM's Fish and Wildlife Division, who was involved in a similar restoration project in Galilee, RI several years ago. He has had an opportunity to visit the site of this proposed project and has offered his knowledgeable viewpoint as to the potential project impacts. Also attached are our final comments on the EA that we ask be incorporated for the record of decision. We also wish to give support to the recommendation made by Greg Mannesto of US Fish and Wildlife that, during the final design of the project, you give consideration to the possibility that a future project may enable further restoration of the salt marsh. With that in mind, it may be possible to design the dredge disposal site in such a way as to facilitate the removal, and perhaps beneficial reuse, of the fill material in the future.

We look forward to receiving the detailed design drawings so that we may complete our review of the Boyd's Marsh Restoration Project and issue a Water Quality Certification. We thank you for your efforts in preparing the EA and for the opportunity to comment on this important project.

Sincerely,

Russell J. Chateauneuf, P.E., Chief
Groundwater/Wetlands Protection

Enclosures

xc: Tom Ardito, RIDEM

Boyd's Marsh Restoration Project
WQC File No. 99-02
Comments on draft environmental assessment

Office of Water Resources

The RIDEM has reviewed the Environmental Assessment for the Boyd's Marsh Restoration Project and supplemental information relating to the alternative analysis submitted on January 9, 2002.

This supplemental information does improve the description of alternatives which are currently provided in the Draft Environmental Assessment. This more thorough description of the upland alternatives to wetland filling does aid the Department in determining compliance with the State Water Quality Regulations. This new information should be incorporated into the EA along with the following.

1. A more thorough description of existing conditions within the proposed wetland impact area should be provided. This description should focus on the homogenous stand of common reed present and the expected types of wildlife that are most likely present within this area.
2. A more thorough description of expected impacts to the existing uses of the proposed wetland impact area should be provided. Specifically, a description of the short and long-term impacts from disposal of dredge on-site to wildlife species that currently utilize the wetland area should be provided.
3. For each alternative, a definitive description of the alternative should be provided including whether on- or off-site disposal is part of the alternative, the location of each off-site disposal site associated with each alternative, and the quantity of sediment that would be generated and disposed.
4. For the preferred alternative, the consideration given and the specific measures recommended to avoid and minimize impacts to existing wetlands, and their functions and values, should be provided.
5. The preferred alternative should be clearly stated within the Environmental Assessment.

Tiv.7 w

RIDEM Fish and Widlife
PO Box 218
West Kingston, RI
02908

Memo

To: Russell J. Chateauneuf, P.E. Chief Groundwater/Wetlands Protection

From: Brian C. Tefft, Principal Wildlife biologist - Fish and Wildlife Brian C. Tefft

CC: Tom Ardito

Date: 01/31/2002

Re: Boyd's Marsh / Town Pond Restoration, Portsmouth

I have had the opportunity to make two recent site visits to the proposed Boyd's Marsh / Town Pond wetland restoration project area. Impacts to wildlife and wildlife habitats that will occur during the restoration and after are certain to be a concern, as they were in the Galilee salt marsh restoration. I would like to address these concerns.

The point to keep in focus is that the wildlife habitat, which has developed on Boyd's marsh occurred as a result of massive amounts of human disturbance when the parcel was filled with dredge spoil in the 1950's. Prior to that event, the indigenous coastal pond and salt marsh that was productive, thriving, and naturally occurring, supporting native populations of fish, shellfish, shorebirds, wading birds, waterfowl and small mammals. The destruction of these habitats and their replacement with the monoculture of tall reed (*Phragmities australis)* resulted in vast diminishing of wildlife habitat values. It is well documented that the tall reed has many features that make it poor wildlife habitat, including its dense growth pattern that impacts wildlife use, the fact that it has virtually no food value for wildlife, and that the plant is invasive (particularly on disturbed sites) out competing other plants with higher food and cover values to native wildlife.

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ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES

Restoration of Boyd's marsh, by removal of dredge spoils and Phragmities, will result in only short-term disturbance to common and/or nuisance wildlife, such as starlings and Norway rats. The shrub and *Phragmities* habitats that dominate much of the perimeter of the marsh provide cover and to a lesser extent, food and nesting space for some common songbirds such as cardinals, robins, titmouse and chickadees. The restoration will have limited short-term impact (temporary) upon these common birds that would relocate during construction and re-colonize these edge habitats that will remain after the restoration is complete. Small common mammals, including voles, mice, skunk, raccoon and opossum will easily relocate during construction and then re-invade areas that will be restored with native plant communities. Large mammals, particularly white-tailed deer and coyotes, live in the extant habitats in small numbers. Both species are highly adaptable in a human dominated landscape and may suffer limited temporary displacement during construction and then re-colonize the area after restoration. My experience at the Galilee project indicates that the deer continued to live in the marsh during construction with no apparent ill effect.

In summary, the benefits to the wildlife community with the restoration in the long run vastly out weigh the short term limited impacts to wildlife during the construction of the project.

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

235 Promenade Street, Providence, RI 02908-5767 TDD 401-831-5508

February 3, 2002

Mr. John R. Kennelly
Chief, Planning Branch
Department of the Army
New England District, Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Re: Town Pond Restoration, Portsmouth, RI

Dear Mr. Kennelly:

The Department of Environmental Management (DEM) has reviewed the draft Town Pond Environmental Restoration Report dated July, 2001. This study, consisting of an Environmental Restoration Report (ERR) and Environmental Assessment, documents of the Corps' feasibility investigation for restoring salt pond and salt marsh habitat at the former dredge material disposal site in Portsmouth, Rhode Island. Assuming that all required regulatory approvals can be obtained as well as Federal funding, construction could begin in late 2002.

According to the ERR, the cost of the project, including the feasibility study, preparation of plans and specifications, construction, construction management, lands, easements, rights-of-way, relocations, and disposal areas (LERRDs) totals $2,550,000. These costs include an estimated $2,126,000 for construction and $95,000 for LERRDs.

We understand that the non-Federal sponsor is responsible for 25% of the total project cost and for 100% of any operations and maintenance (O&M) cost. According to the ERR, the non-federal share is estimated at $638,000, of which $543,000 is in cash contributions and the remaining estimated $95,000 will be credited real estate costs for the value of the project lands. The O&M costs are expected to be $2,500. We also understand that all of the LERRD costs associated with this project are eligible for cost sharing.

30% post-consumer fiber

The DEM hereby concurs with the recommendations of the draft ERR and supports the plan (alternative #6) recommended in the ERR. The DEM also hereby acknowledges our intention to sign the draft Project Cooperation Agreement (PCA) that is being negotiated between the Corps and DEM as the non-Federal sponsor of the project.

Please direct any questions you may have on this letter to Mr. Thomas Ardito at 401-222-3961, Extension 7237.

Sincerely,

Jan H. Reitsma
Director
Rhode Island
Department of Environmental Management

cc: F. Vincent
M. Grant
R. Chateauneuf
T. Walsh
G. Schultz
R. Ribb
T. Ardito
K. Ayers
A. Gettman
J. Stolgitis
B. Tefft

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Field Office
70 Commercial Street, Suite 300
Concord, New Hampshire 03301-5087

January 3, 2002

John Kennelly
Engineering/Planning Division
Evaluation Branch
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742

Dear Mr. Kennelly:

This responds to your November 7, 2001 letter requesting our review of the proposed Draft Project Modification Report and Environmental Assessment of Town Pond Restoration (Boyd's Marsh), Portsmouth, Rhode Island. The following comments are provided in accordance with the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and constitutes our final Fish and Wildlife Coordination Act report on the project.

Town Pond (Boyd's Marsh) has excellent restoration potential and this project will restore valuable salt pond/salt marsh habitat that was eliminated by placing dredge material on this area in the early 1950s. We agree with the Corps that the restoration should be a combination of 50% salt marsh-50% open water/intertidal habitat. Our letter of February 25, 1999 recommended this 50/50 mix, but we recommended that the dredge material be taken off-site. The Corps Preferred Alternative 6 retains the dredge material on-site and restores approximately 16.6 acres with an approximately 7-acre on-site storage area. We still prefer that the dredge material be taken off-site, but if cost considerations of the local sponsor (RIDEM) limit the amount of material that can be disposed of off-site, the storage area should be redesigned to maximize the amount of salt pond/salt marsh restored. Also, the material should be placed as conveniently as possible to allow for easy removal in the future.

There are many potential ways to reduce the size of the proposed storage area. First, most of the dredge material should be moved closer to Anthony Road. The public viewing area and parking lot should be located on a large mound of dredge material that would provide a good view of the restoration site. The largest amount of dredge material should be stockpiled along Anthony Road between the viewing area and the access road to the power transmission lines. The material could then be easily transported off-site. Some material could be located adjacent to the access road and/or

under the power transmission line right-of-way. Finally, the proposed berm to protect the fresh water stream from the salt water restoration area could be enlarged to incorporate more dredge material. The redistribution of dredge material to other on-site locations allows the proposed storage area to be eliminated and increases the restoration area by approximately 40%.

It is important to understand the tidal flow and hydrology of the site before we develop final plans and elevations for different types of salt marsh features. Restoration can be accomplished by removing the dredged material to elevations of the low and high salt marsh found at the restored Common Fence Point salt marsh. If possible, at least a 2 to 1 ratio of high marsh to low marsh should be recreated. Nixon (1982) found that Rhode Island salt marshes had a 2 to 1 ratio, while Maine had an 11 to 1 ratio, and New Hampshire, a 14 to 1 ratio. Within the newly-graded high marsh, small panes and ponds should be created for habitat diversity. Tidal channels need to be dug to some ponds but not all of the ponds. This will allow more plant diversity between the channels and the high and low salt marsh. These salt marsh features are important because a great deal of wildlife activity takes place in and around the panes, ponds, and tidal channels.

The proposed channel north of the railroad needs to be redesigned to handle increased tidal flow. The tidal channel should not be the factor that limits tidal exchange because salt water needs to reach all sections of Phragmites in order to reduce the height and dominance of Phragmites in favor of other salt marsh vegetation. If funding limits the number of acres that can be restored, then at a minimum, tidal channels could be cut into the remaining acres of Phragmites.

We strongly support this project and recommend that the Corps choose an alternative which restores the largest amount of the impacted area to 50% salt marsh and 50% salt pond with a ratio of high marsh to low marsh of at least 2 to 1. We recommend that the Corps and the local sponsor continue to pursue plans to dispose of the dredge material off-site. Thank you for your cooperation and please contact Greg Mannesto of our Rhode Island Field Office at 401-364-9124 if we can be of further assistance.

Sincerely yours,

William J. Neidermyer

William J. Neidermyer
Assistant Supervisor
Federal Activities
New England Field Office

CC: Reading File
Laura Ernst, CRMC
Peter Holmes, EPA
Rick Enser, RI NHP
Tom Ardito, RIDEM
ES: GMannesto:1-3-02:401-364-9124

References

Nixon, S.W. 1982. The Ecology of New England High Salt Marshes: A Community Profile. USFWS, Div. Biol. Serv., Washington D.C., FWS/OBS-81/55. 70 pp.

Oliver

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

DIVISION OF AGRICULTURE
MOSQUITO ABATEMENT COORDINATION
4808 Tower Hill Road
Wakefield, RI 02879

[redacted]
(401) 789-6280
FAX (401) 783-5876

David Larsen
Engineering/Planning
ACOE
Concord, Mass

December 11, 2001

Dear Mr. Larsen,

I am responding to the ACOE Nov. 30 Public Notice titled "Town Pond Restoration, Portsmouth, Rhode Island". I am in support of the plan as it will eliminate a sizable mosquito production site, which is a public health issue. My office will continue to participate in this very worthwhile project.

Sincerely,

Alan D. Gettman, PhD
Mosquito Abatement Coordinator

Public Notice

U.S. Army Corps
Of Engineers
New England District
696 Virginia Road
Concord, MA 01742-2751

Date: November 30, 2001

Comment Period Closes: December 30, 2001

Evaluation Branch, Engineering/Planning Division

TOWN POND RESTORATION
PORTSMOUTH, RHODE ISLAND

Interested parties are hereby notified that the U.S. Army Corps of Engineers, New England District, in partnership with the State of Rhode Island and Providence Plantations, through their Department of Environmental Management, is proposing restoration of the Town Pond, in Portsmouth, Rhode Island. The project is proposed under the authority contained in Section 1135 of the Water Resources Development Act of 1986 (PL99-662), as amended. Section 1135, entitled "Project Modifications For Improvement of Environment". This public notice provides information about salt marsh restoration and disposal of material to be excavated within the project area and documents all pertinent laws and regulations that are applicable.

Project Description: The habitat at the project site historically consisted mostly of salt pond with a relatively small proportion of salt marsh. Disposal of dredged material in the pond in the early 1950's to construct the Fall River Navigation Improvement Project converted the majority of the area from salt pond to common reed (*Phragmites australis*) marsh. The common reed marsh is now above the level of normal tidal inundation.

The recommended alternative would restore a combination of salt pond and salt marsh by grading and excavation. The plan will require deepening of the existing inlet to the marsh to ensure adequate tidal flow. The recommended alternative is designed to separate tidal flows from freshwater in Founder's Brook, adjacent to the west side of the project site.

The plan calls for disposal of the excavated material on-site, which will require filling of existing wetlands. Although some fill in wetlands may be necessary, the goal of the project is to maximize restoration of estuarine habitats and minimize wetland filling.

Purpose and Need for Work: The purpose of this project is to restore estuarine habitat, salt marsh and the associated values of these habitats to fish and wildlife. The majority of Town Pond within the area to be restored contains degraded freshwater habitat dominated by common reed and freshwater wetland vegetation due to the elimination of tidal flooding and filling with dredged material. Where it dominates large areas of a habitat, common reed is a nuisance species with relatively low value for fish and wildlife. Grading to lower elevations and restoration of periodic tidal inundation with salt water will restore valuable estuarine habitats.

Project Description Alternatives: Several project alternatives were considered. The following paragraphs summarize each alternative. Alternative 6 is the alternative recommended for implementation.

Alternative 1, No Action Alternative

If no action is taken to restore the salt marsh and estuarine habitats, it will continue to exist in its present degraded condition dominated by common reed. The site may change to a shrub then forested freshwater wetland over a very long period of time, but the persistence of common reed suggests that this process would be slow, particularly if fires occur in the marsh. The improvements in fish and wildlife resource values that would be generated with an estuarine restoration project would not be achieved.

Alternative 2, Restore Salt Marsh and Creek Habitats with Off-Site Placement of Excavated Material

The existing dredged material would be excavated to elevation 2.88 ft along the inland edge of the project area and slope at 1 percent toward a tidal creek. At the tidal creek the slope would change to 1:3. The main channel would have a 5-ft bottom width and an invert sloping from -1.9 ft at Mount Hope Bay to -1.3 ft at the railroad bridge, then to 0.0 ft at the upstream end. Feeder channels would have a 3.3 ft bottom width.

High marsh is expected to occur between elevation 2.88 ft to 2.72 ft for a width of 16.4 ft. Low marsh is expected to occur between elevation 2.72 ft to 0.46 ft for a width of 226 ft. Mudflat would be created with a one percent slope (may be adjusted to fit design), between the lower limit of low marsh and the upper edge of the channel. The portion of the main tidal creek below elevation 0.0-ft would contain permanent open water.

A berm would be constructed to separate Founder's Brook from the area of restored tidal exchange. The berm would be constructed of material excavated for the project and selected vegetation would be planted to naturally inhibit foot travel along its crest. A new culvert with concrete headwalls would be built to replace the antiquated culvert at the end of the brook that is southwest of the railroad bridge. A new flap gate would be provided at the downstream end of the culvert where Founder's Brook flows enter the tidal marsh. The channel connecting Town Pond to Mount Hope Bay would be partially relocated and deepened. No channel modifications are proposed at the railroad bridge. However, stone riprap will be placed around each of the two abutments to protect them from potential tidal scouring. It is expected that the Town Pond entrance channel will find a new equilibrium once tidal flow is restored. It is likely to meander less than it does at present due to the increased volume of water flowing in and out with each tide cycle.

The estimated excavation quantity is 86,700 CY and the estimated construction cost is $3.05M. All excavated material, except that used for the berm, is assumed to be placed off-site, 10 miles away, without a fee.

Alternative 3, Restore A Combination Of Fifty-Percent Salt Marsh-Fifty Percent Open Water/Intertidal Habitats with Off-Site Placement of Excavated Material

The existing dredged material would be excavated to elevation 2.88 ft along the inland edge of the project area and slope at 1 percent toward the interior of the marsh for a width of 16.5 ft. From 16.4 ft out, the slope would change to 1:10 for 32.81 ft of width for most of the perimeter. Wider areas of salt marsh would slope from elevation 2.72 ft to the edge shown at variable slopes between 1 to 10 percent. The remainder of the site would slope to the centerline invert at a constant slope (based on distance). The main channel would have an invert sloping from –1.97 ft at Mount Hope Bay to –1.31 ft at the railroad bridge. The centerline invert of the restored pond upstream of the railroad bridge would slope from –3.28 ft at the bridge to –1.97 ft at the upstream end. A weir with a top elevation of –0.20 ft would maintain open water depths between 3.08 ft to 1.77 ft deep with a median depth at the halfway point of 2.43 ft.

High marsh is expected to occur between elevation 2.88 ft to 2.72 ft for a width of 16.4 ft on the 1:100 slope. Low marsh is expected to occur between elevation 2.72 ft to 0.46 ft on a variable slope for an area of approximately 9 acres. Mudflat would occur between the lower limit of low marsh (0.46 ft) and the upper edge of the open water (-0.20 ft). The water surface elevation would be controlled by a weir placed just upstream of the culvert that runs parallel to the railroad bed to maintain permanent open water. The crest of the weir would be placed at -0.20 ft to create a low water elevation 0.66-ft below the lowest elevation of salt marsh to avoid waterlogged soil conditions. The weir would allow periodic flushing of the system if needed and would allow minor adjustments to water levels to be made easily.

A berm would be constructed to separate Founder's Brook from the area of restored tidal exchange. The berm would be constructed of material excavated for the project and selected vegetation would be planted to naturally inhibit foot travel along its crest. A new culvert with concrete headwalls would be built to replace the antiquated culvert at the end of the brook that is southwest of the railroad bridge. A new flap gate would be provided at the downstream end of the culvert where Founder's Brook flows enter the tidal marsh. The channel connecting Town Pond to Mount Hope Bay would be partially relocated and deepened. No channel modifications are proposed at the railroad bridge. However, stone riprap will be placed around each of the two abutments to protect them from potential tidal scouring. It is expected that the Town Pond entrance channel will find a new equilibrium once tidal flow is restored. It is likely to meander less than it does at present due to the increased volume of water flowing in and out with each tide cycle.

The estimated excavation quantity is 141,400 CY and the estimated construction cost is $4.05M. All excavated material, except that used for the berm, is assumed to be placed off-site, 10 miles away, without a fee.

Alternative 4, Restore the Previously Existing Intertidal/Subtidal Habitats with Salt Marsh Fringe and Off-Site Placement of Excavated Material

The existing dredged material would be excavated to elevation 2.88 ft along the inland edge of the project area and slope at 1 percent toward a tidal creek for a width of 16.4 ft. From 16.4 ft out, the slope would change to 1:10 for 32.8 ft. The remainder of the site would slope to the centerline invert at a constant slope (based on distance). The main channel would have an invert sloping from -1.97 ft at Mount Hope Bay to -1.3 ft at the railroad bridge. Upstream of the railroad bridge there would be no channel. Two potential centerline invert elevations with the same slope would be considered.

Alternative 4A. The centerline invert of the restored pond upstream of the railroad bridge would slope from -1.3 ft at the bridge to 0.0 ft at the upstream end. This would maintain a constant slope from Mount Hope Bay to the upstream end of the project. A weir with a top elevation of -0.20 ft would maintain open water depths between 1.12 ft to 0.0 ft deep with a median depth at the halfway point of 0.53 ft.

Alternative 4B. The centerline invert of the restored pond upstream of the railroad bridge would slope from -3.28 ft at the bridge to -1.97 ft at the upstream end. This would allow a deeper pond to be created to enhance waterfowl and fisheries habitat value. A weir with a top elevation of -0.2 ft would maintain open water depths between 3.08 ft to 1.77 ft deep with a median depth at the halfway point of 2.33 ft.

Under both of these open water alternatives, high marsh is expected to occur between elevation 2.88 ft to 2.72 ft for a width of 16.4 ft on the 1:100 slope. Low marsh is expected to occur between elevation 2.72 ft to 0.46 ft for a width of 22.6 ft on a 1:10 slope. Mudflat is expected to occur between the lower limit of low marsh (0.46 ft) and the upper edge of the open water (-0.2 ft). The water surface elevation would be controlled by a weir placed just upstream of the culvert that runs parallel to the railroad bed to maintain permanent open water. The crest of the weir would be placed at -0.2 ft to create a low water elevation 0.66 ft below the lowest elevation of salt marsh to avoid waterlogged soil conditions. The weir would allow periodic flushing of the system if needed and would allow minor adjustments to water levels to be made easily. An additional 26,800 CY excavation would be required for Alternative 4B to create depths of 1.77 ft to 3.08 ft of permanent open water behind the weir, but the quality of the habitat may be greater.

For both options a berm would be constructed to separate Founder's Brook from the area with restored tidal exchange. The berm would be constructed of material excavated for the project and selected vegetation would be planted to naturally inhibit foot travel along its crest. A new culvert with concrete headwalls would be built to replace the antiquated culvert at the end of the brook that is southwest of the railroad bridge. A new flap gate would be provided at the downstream end of the culvert where Founder's Brook flows enter the tidal marsh. The channel connecting Town Pond to Mount Hope Bay would be partially relocated and deepened. No channel modifications are proposed at the railroad bridge. However, stone riprap will be placed around each of the two abutments to protect them from potential tidal scouring. It is expected that the Town Pond entrance channel will find a new equilibrium once tidal flow is restored. It is likely to meander less than it does at present due to the increased volume of water flowing in and out with each tide cycle.

For Alternative 4A, the estimated excavation quantity is 132,400 CY and the estimated

construction cost is $3.81M. For Alternative 4B, the estimated excavation quantity is 159,200 CY and the estimated construction cost is $4.38M. All excavated material, except that used for the berm, is assumed to be placed off-site, 10 miles away, without a fee.

Alternative 5, Restore Salt Marsh and Creek Habitats with On-Site Placement of Excavated Material

As with Alternative 2, the existing dredged material would be excavated to elevations that would support salt marsh (mostly low marsh) with creeks to convey tidal flow. There would be approximately 1.20 acres of high marsh, 13.72 acres of low marsh, 0.2 acres of mudflats, and 0.5 acres of tidal creeks.

A berm would be constructed to separate Founder's Brook from the area with restored tidal exchange. The berm would be constructed of material excavated for the project and selected vegetation would be planted to naturally inhibit foot travel along its crest. A new culvert with concrete headwalls would be built to replace the antiquated culvert at the end of the brook that is southwest of the railroad bridge. A new flap gate would be provided at the downstream end of the culvert where Founder's Brook flows enter the tidal marsh. The channel connecting Town Pond to Mount Hope Bay would be partially relocated and deepened. No channel modifications are proposed at the railroad bridge, however, stone riprap will be placed around each of the two abutments to protect them from potential tidal scouring. It is expected that the Town Pond entrance channel will find a new equilibrium once tidal flow is restored. It is likely to meander less than it does at present due to the increased volume of water flowing in and out with each tide cycle.

Excavated material not used to construct the berm would be placed at an area on the east side of the marsh extending from the edge of the access road along a broad arc that defines the limit of the restoration on the east side. This area is situated to maximize the horizontal distance from the proposed restoration to the ponds used for irrigation on the abutting golf course.

The estimated excavation quantity is 68,300 CY and the estimated construction cost is $2.25M.

Alternative 6, Restore A Combination Of Fifty-Percent Salt Marsh-Fifty Percent Open Water/Intertidal Habitats with On-Site Placement of Excavated Material

This is the alternative recommended for implementation.

As with Alternative 3, the existing dredged material would be excavated to elevations that would support about half salt marsh and half mudflat/open water. There would be 2.33 acres (0.95 hectares) of high marsh, 4.48 acres (1.81 hectares) of low marsh, 2.98 acres (1.20 hectares) of mudflats, and 5.37 acres (2.17 hectares) of permanent open water. A weir with a top elevation of -0.2 ft would maintain permanent open water depths between 2.88 ft to 1.77 ft with a median depth at the halfway point of 2.33 ft.

A berm would be constructed to separate Founder's Brook from the area with restored tidal exchange. The berm would be constructed of material excavated for the project and selected vegetation would be planted to naturally inhibit foot travel along its crest. A new culvert with concrete headwalls would be built to replace the antiquated culvert at the end of

the brook that is southwest of the railroad bridge. A new flap gate would be provided at the downstream end of the culvert where Founder's Brook flows enter the tidal marsh. The channel connecting Town Pond to Mount Hope Bay would be partially relocated and deepened. No channel modifications are proposed at the railroad bridge. However, stone riprap will be placed around each of the two abutments to protect them from potential tidal scouring. It is expected that the Town Pond entrance channel will find a new equilibrium once tidal flow is restored. It is likely to meander less than it does at present due to the increased volume of water flowing in and out with each tide cycle.

Excavated material not used to construct the berm would be placed at an area on the east side of the marsh extending from the edge of the access road along a broad arc that defines the limit of the restoration on the east side. The minimum slope is 1:3, although slopes of 1:4 or 1:5 would be preferred, provided there is enough area. This area is situated to maximize the horizontal distance from the proposed restoration to the ponds used for irrigation on the abutting golf course.

The estimated excavation quantity is 99,800 CY and the estimated construction cost is $2.55M.

Coordination: The proposed work is being coordinated with the following Federal, State and local agencies:

Federal Agencies:
U.S. Environmental Protection Agency, Region 1, Boston, MA
U.S. Fish and Wildlife Service, Concord, NH
National Marine Fisheries Service, Gloucester, MA
Natural Resources Conservation Service, West Warwick, RI

State Agencies:
Rhode Island Department of Environmental Management
Rhode Island Coastal Resources Management Council
Rhode Island Natural Heritage Program
Rhode Island Historic Preservation Office
Rhode Island Department of Administration, Office of Strategic Planning

Local Agencies:
Town of Portsmouth Rhode Island

Endangered Species: No Federal or State listed threatened or endangered species are expected to be affected by the proposed project. Coordination with the U.S. Fish and Wildlife Service and National Marine Fisheries Service has been conducted to determine whether there are Federally listed endangered or threatened species in the proposed project area. Coordination with the Rhode Island Natural Heritage Program has also been conducted.

Environmental Impacts: A Draft Environmental Assessment and Finding of No Significant Impact has been prepared and will be available for public review upon request. A determination has been made that an Environmental Impact Statement for the proposed restoration project is not required under the provisions of the National Environmental Policy Act of 1969. Those who desire a copy of the Draft Environmental Assessment and Finding of

No Significant Impact should contact Mr. David Larsen, US Army Corps of Engineers, New England District, Engineering/Planning Division at 696 Virginia Road, Concord, MA 01742, ATTN: Engineering/Planning Division, within 30 days of this notice.

Cultural Resources: No State listed historical or cultural resources are expected to be impacted by the proposed restoration project. The study was coordinated with the Rhode Island State Historic Preservation Officer in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended.

Federal Consistency with Coastal Zone Management: A determination regarding the consistency of the project with the approved State coastal zone management program will be provided to the Coastal Resources Management Council prior to implementation.

Executive Order 11988 Floodplain Management: This project must be located in the floodplain to achieve the project purpose.

Compliance: This Public Notice is being issued in compliance with several environmental laws and regulations (see Attachment A).

Additional Information: Any person who has an interest which may be affected by the proposed restoration at Town Pond may request a public hearing. The request must be submitted in writing to me within 30 days of the date of this notice and must clearly set forth the interest which may be affected and the manner in which the interest may be affected by this activity.

Please bring this notice to the attention of anyone you know to be interested in the project. Comments are invited from all concerned parties and should be directed to the District Engineer at 696 Virginia Road, Concord, MA 01742, ATTN: Engineering/Planning Division (Mr. David Larsen), within 30 days of this notice.

Nov 30, 2001
Date

Brian E. Osterndorf
Colonel, Corps of Engineers
District Engineer

Attachment A

PERTINENT LAWS, REGULATIONS AND DIRECTIVES

The proposed activity was reviewed in accordance with the following laws and executive orders as applicable:

Federal Statutes

Preservation of Historic and Archaeological Data Act of 1974, as amended, 16 U.S.C. 469 et seq.

Clean Air Act, as amended, 42 U.S.C. 7401 et seq.

Clean Water Act of 1977 (Federal Water Pollution Control Act Amendments of 1972) 33 U.S.C. 1251 et seq.

Coastal Zone Management Act of 1972, as amended, 16 U.S.C. 1431 et seq.

Endangered Species Act of 1973, as amended, 16 U.S.C. 1531 et seq.

Estuarine Areas Act, 16 U.S.C. 1221 et seq.

Federal Water Project Recreation Act, as amended, 16 U.S.C. 4601-12 et seq.

Fish and Wildlife Coordination Act, as amended, 16 U.S.C. 661 et seq.

Land and Water Conservation Fund Act of 1965, as amended, 16 U.S.C. 4601-4 et seq.

Marine Protection, Research, and Sanctuaries Act of 1972, as amended, 33 U.S.C. 1401 et seq.

National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470 et seq.

National Environmental Policy Act of 1969, as amended, 42 U.S.C. 4321 et seq.

Rivers and Harbors Act of 1899, as amended, 33 U.S.C. 401 et seq.

Watershed Protection and Flood Prevention Act, as amended, 16 U.S.C. 1001 et seq.

Executive Orders

Executive Order 11988, Floodplain Management, 24 May 1977 amended by Executive Order 12148, 20 July 1979.

Executive Order 11990, Protection of Wetlands, 24 May 1977.

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, 11 February 1994.

Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks, 21 April 1997.

Executive Memorandum

Analysis of Impacts on Prime or Unique Agricultural Lands in Implementing NEPA, 11 August 1980.

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

235 Promenade Street, Providence, RI 02908-5767 TDD 401-831-5508

4 April 2001

Mr. V.A. Sridhar
U.S. Fish and Wildlife Service
7333 W. Jefferson Ave #375
Lakewood, CO 80235

Re: Sachuest Landfill / Town Pond Restoration

Dear Mr. Sridhar:

Thank you for taking the time to speak with me on March 27th regarding the potential use of approximately 65,000 cubic yards of sediment from the Town Pond Restoration Project in the remediation of landfill(s) at Sachuest Point National Wildlife Refuge. Mr. David Larsen of the U.S. Army Corps of Engineers, New England Division is the federal project manager on the Town Pond Restoration Project and is in charge of completing the restoration plan for the site. I relayed the substance of our conversation to Mr. Larsen, who agreed to send you all available sediment data as soon as possible. On receipt of my copy of his letter to you, I will forward it to interested state parties per the cc list below.

In our conversation, you also mentioned that the Department of Environmental Management (DEM) would need to approve the use of the Town Pond material at the Sachuest Point site. I have discussed this with Mr. Ron Gagnon, Chief of our Office of Technical and Customer Assistance, who has asked that you address a letter to:

Ms. Laurie Grandchamp
Supervising Engineer
DEM Office of Waste Management
235 Promenade Street, Room 380
Providence, RI 02908

requesting approval for the use of this material in the remediation of the Sachuest Point site.

Enclosed for your files is a letter dated February 19 of this year, from Ms. Grandchamp to Mr. John Kennelly of the Corps, granting approval for use of a limited quantity of this material at the Tiverton municipal landfill, for purposes of a pilot study which is now under way.

Thank you again, Mr. Sridhar, for your interest in the Town Pond Restoration Project. I look forward to meeting with you when you are here in May, at which time Mr. Larsen will also be available, and hope to hear from you again soon. If I can provide you with additional information or assistance, please do not hesitate to call me at (401) 222-3961 ext. 7237.

Sincerely,

Thomas Ardito
Policy & Outreach Coordinator
Narragansett Bay Estuary Program
R.I. Department of Environmental Management

enclosure

cc (less enclosure): R. Gagnon, T. Walsh, R. Ribb, L. Grandchamp, J. Crawford, DEM
J. Kennelly, D. Larsen, L. Oliver, ACOE
D. Reis, L. Ernst, CRMC
Gary Andres, USFWS

Oliver

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

235 Promenade Street, Providence, RI 02908-5767 TDD 401-831-5508

CERTIFIED MAIL

February 19, 2001

John R. Kennelly, Deputy Chief
Engineering/Planning Division
Department of the Army
New England District, Corp of Engineers
696 Virginia Road
Concord, MA 01742

RE: Town Pond Restoration Landfill Disposal Pilot Study

Dear Mr. Kennelly:

The RIDEM, Office of Waste Management (OWM) has reviewed the Disposal Plan for the Town Pond Restoration Project Pilot Study. The plan describes the procedures for excavating 75 cubic yards of dredge material from Town Pond and transporting it to the Tiverton Landfill as a pilot test to assess the suitability of the material for cover at the landfill.

Based on the limited analytical information provided and the procedures detailed in the Disposal Plan, the Office of Waste Management approves the disposal of the 75 cubic yards of the dredge material as cover at the Tiverton Landfill with the following conditions:

1. Prior to the transportation of the dredge material to the landfill, all of the material must by properly dewatered in accordance with the procedures required by the Water Quality Certification. Specifically, free water must be allowed to drain from the dredge material on the upland area adjacent to the site as described in the Water Quality Certification Application prior to transportation to the landfill.

2. The performance of this material must meet the minimum performance criteria for landfill cover as set forth in the Solid Waste Regulations.

3. A copy of the report describing the results of the pilot study will be provided to the OWM.

30% post-consumer fiber

4. The Department reserves the right to rescind this approval based upon the compliance status of the Tiverton Landfill.

If you have any questions, please call Daniel Russell at 222-2797, ext. 7528.

Sincerely,

Laurie A. Grandchamp

Laurie Grandchamp
Supervising Engineer
Office of Waste Management

cc: Ron Gagnon, DEM OWM
Terry Walsh, DEM, OWR
James Towers, Town of Tiverton

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

235 Promenade Street, Providence, RI 02908-5767 TDD 401-831-5508

January 30, 2001

Mr. Richard Ribb
Narragansett Bay Estuary Program
Rhode Island Department of Environmental Management
235 Promenade Street
Providence, RI 02908

RE: WQC File No. 00-108; Town Pond (Boyd's Marsh), Portsmouth

Dear Mr. Ribb,

The RIDEM-Office of Water Resources (OWR) has reviewed your application for a Water Quality Certificate for the above referenced project. The project involves performing a wetland restoration project pilot study. The study involves dredging approximately seventy-five cubic yards of sediment from within the Town Pond wetland complex and transport of the dredged material to Tiverton Landfill to determine the materials' suitability as cover.

We have reviewed the subject application and site plans entitled "Boyd's Marsh Restoration, Section 1135, Portsmouth, Rhode Island," sheet 1 of 1 (plus accompanying plans), date not indicated, received December 22, 2000. The State water associated with this project is Town Pond (Boyd's Marsh) (Class SA).

It is the opinion of the Water Quality Certification Program that said project is in compliance with the requirements of the State Water Quality regulations provided that the applicant complies with the above plans and the following conditions.

1. Material used for construction is clean and free of matter that could cause pollution of the waters of the State.

2. Shellfish excavated from the area are not made available for any use, including human consumption or for bait.

3. Dredged material shall be disposed of on the property known as Tiverton Landfill, as shown on the above referenced plans. No other areas on or off site are authorized for dewatering, disposal, or stockpiling.

4. All sediments generated during construction must be disposed of properly. Sediment shall not be disposed of in or near state or federally regulated wetlands.

5. No sewage, refuse, or waste of any kind shall be discharged into waters of the State.

6. The Water Quality Certification does not remove your obligation to obtain any necessary permits from other local, state, or federal agencies.

7. This Water Quality Certificate shall expire three (3) years from the date of issuance if project construction is not completed in that time.

This is the State's Water Quality Certification. Violations of the terms and conditions of this WQC may result in withdrawal of this Certification. Such withdrawal may constitute violation of other permits or approvals for which this WQC was provided. In addition, violation of the terms and conditions of this Certification may result in violation of the State's Water Quality regulations and appropriate enforcement action.

Sincerely,

Russell J. Chateauneuf, P.E., Chief
Groundwater/Wetlands Protection

RJC/nbp
G/W/C/Neal/State WQC/00-108 RIDEM Town Pond-Portsmouth.doc

Cc: Terry Simpson; OWR
Tom Ardito; NBEP

02/02/2001 FRI 13:46 FAX 401 222 3564 RIDEM WATER RESOURCES 003

Oliver/78347/ja

December 19, 2000

Engineering/Planning Division
Evaluation Branch

Mr. Ronald Gagnon, Chief
Office of Technical and Customer Assistance
Rhode Island Department of Environmental Management
235 Promenade Street
Providence, Rhode Island 02908-5767

Dear Mr. Gagnon:

Enclosed with this letter please find the Disposal Plan and application for Water Quality Certification for the Town Pond Restoration Project Pilot Study. As we've discussed, this pilot study will allow us to determine whether the dredged material we hope to excavate from Town Pond will be acceptable to the operators of the Tiverton Landfill. Please distribute the plan and application package to the appropriate offices in your department. The Water Quality Certification Application Form requires the signature of the owner of the property. Since the state of Rhode Island owns the property, I have assembled the appropriate information and enclosed the application form unsigned.

If you have any questions about this information, the pilot study, or the overall restoration project, please contact Mr. Larry Oliver of our Environmental Resources Section, at (978) 318-8347, or the project manager, Mr. David Larsen at 978-318-8113.

Sincerely

John R. Kennelly
Deputy Chief, Engineering/Planning Division

Enclosure

CF:
Oliver ✓
Hubbard
O'Donnell
Read File
E/P Files
(Oliver/PilotWQCsolidwaste.doc)

N.PERSONE @ DEM....

Boyd's Marsh Meeting
9/6/2000
RIDEM Rm 300

In Attendance	Representing	Telephone Number
Bob Driscoll	Town of Portsmouth	683-3255
LARRY OLIVER	CORPS OF ENGINEERS	978-318-8347
Laura Fraser	corps of engineers	978-318-8068
John Kennelly	Corps of Engineers	978-318-8505
David Larsen	Corps of Engineers	978-318-8113
Neal Personeus	RIDEM WQC Program	401-222-4700 x 7610
DANIEL RUSSELL	RIDEM OFFICE OF WASTE MGMT.	401-222-2797 x 7521
Carolyn Weymouth	RIDEM/OTCA	(401) 222-4700, x-4422
Ron Gagnon	RIDEM/OTCA	222-6822 x 7500
John Ratcliffe	TIVERTON D.P.W FAX - 401-625-6763	401/625-6760
JIM TOWERS	TIVERTON ADMINISTRATOR	401/625-6710
Terry J. Walsh	RIDEM/OWR-WQC	401/222-3961 x 7243
RICHARD RIBB	RIDEM/NARRA. BAY ESTUARY PROG.	401/222-3961 x.7271
CHARLES LAMBERSON	STATE REP	847-2810

L. Oliver copy.

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

235 Promenade Street, Providence, RI 02908-5767 TDD 401-831-5508

April 3, 2000

Mr. David Larson, Project Manager
ACOE/New England Division
Engineering & Planning Division
696 Virginia Road
Concord, MA 01742-2751
Meter code 100

Subject: Boyd's Marsh Sediment Testing

Dear Mr. Larson:

The purpose of this letter is to summarize our meeting of March 3, 2000 at which the Army Corps of Engineers (ACOE) and the Rhode Island Department of Environmental Management (RIDEM) discussed the adequacy of sediment testing performed at Boyd's Marsh in Portsmouth, Rhode Island. In attendance at the subject meeting were the following:

David Larson	ACOE Engineering and Planning Division
Larry Oliver	ACOE Engineering and Planning Division
Ron Gagnon	RIDEM/OTCA
Terry Walsh	RIDEM/Water Quality Certification Program
Carolyn Weymouth	RIDEM/OTCA

The subject of our discussion was the adequacy of sediment testing performed by the ACOE to meet RIDEM Division of Waste Management requirements for upland disposal of the dredged material at a landfill. The following factors specific to this project were considered:

- Testing already performed shows TPH values falling into the Class III range. All other contaminant concentrations are below applicable regulatory standards. These results indicate that the proposal is eligible for RIDEM's Office of Waste Management review for upland disposal at a landfill as cover material.

- RIDEM's Water Quality Certification Program has determined that no further sediment testing will be required for the portion of the dredged material that is to remain on-site within 200' of the shoreline.

- The disposal of the subject dredged material is an integral part of the plan to restore Boyd's Marsh, in Portsmouth, R.I. RIDEM recognizes the public benefit that the proposed project would serve and is acting as the local sponsor in the restoration partnership.

- RIDEM policy for disposal of dredged material at upland sites is under revision. No written guidance was provided to the ACOE regarding the number of samples and number of iterations of tests that would be required for upland disposal of dredged material off site prior to their undertaking the sampling/testing under discussion.

Following discussion of the above factors, it was determined that RIDEM's Office of Waste Management will not require further sediment testing for this project if the ACOE applies to dispose of the subject dredged material as cover at the Tiverton Landfill. It was further agreed that complete information regarding any dewatering and storage of the material prior to its use as cover at the landfill will be provided to the RIDEM for review and approval.

It was noted that the decision to accept the sampling and testing already accomplished was a case-specific determination made on this project and should **not** be considered indicative of RIDEM requirements for every project.

If the above information differs in any way from your understanding of our discussion of February 16, 2000, please contact me so that we can clarify the issue together. I can be reached at 222-4700, x-7500. We appreciate the opportunity to have met with you and look forward to seeing our shared goal of restoring Boyd's Marsh accomplished .

Please be aware that this letter is not to be construed as a permit to undertake work or as any indication that any permit for this project will ultimately be granted. This letter does not relieve the project proponent from his obligation to obtain any local, state or federal approvals or permits required by ordinance or law.

Sincerely,

Ronald Gagnon

Ronald Gagnon, Chief
Office of Technical and Customer Assistance

Cc: T. Gray

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

235 Promenade Street, Providence, RI 02908-5767 TDD 401-831-5508

December 14, 1999

Mr. Larry Oliver
Department of the Army
New England District, Corps of Engineers
Engineering/Planning Division
Planning Branch
696 Virginia Road
Concord, MA 01742-2751

Re: **Boyd's Marsh Restoration Project**

Dear Mr. Oliver:

The purpose of this letter is to summarize the discussion that took place at our 11/18/99 meeting at the Rhode Island Department of Environmental Management. Meeting with you on that occasion were Dan Russell, RIDEM Office of Waste Management, Terry Walsh, RIDEM Office of Water Resources and Carolyn Weymouth, of the Office of Technical & Customer Assistance.

As we discussed, the RIDEM Office of Water Resources, Water Quality Program will not require further sediment testing for the portion of the dredged material that is to remain on-site, within 200 feet of the shoreline.

Any dredged material which is proposed for upland disposal will fall under the jurisdiction of the RIDEM Office of Waste Management. As such, any additional sediment testing requirements will be dictated by this program. When details of the proposed project are finalized, the Office of Waste Management will be able to determine what, if any, additional sediment testing will be required.

Please feel free to contact me, or Carolyn Weymouth of my staff, at (401) 222-4700 should you have questions. My extension is 7500 and Carolyn is at x-4422. We look forward to continuing to work with you as this most important project progresses.

Sincerely,

Ronald Gagnon

Ronald Gagnon, Chief
Office of Technical & Customer Assistance

RIDEM/ACOE MEETING
Sediment Testing/Boyd's Marsh
1 pm, November 18, 1999, SUITE 250, RIDEM

IN ATTENDANCE	REPRESENTING
Carolyn Weymouth	RIDEM/OTEA
LARRY OLIVER	CORPS OF ENGINEERS
DANIEL RUSSELL	RIDEM/OWM
Terry Walsh	RIDEM/WQC

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

235 Promenade Street, Providence, RI 02908-5767 TDD 401-831-5508

October 27, 1999

John R. Kennelly, Deputy Chief
Engineering/Planning Division
Corps of Engineers, New England District
696 Virginia Road
Concord, MA 01742-2751

Dear Mr. Kennelly:

I am in receipt of your September 10, 1999 letter and the accompanying sediment testing results for samples taken at Boyd's Marsh, in Portsmouth, R.I. You ask, in your letter, that the RI Department of Environmental Management (RIDEM) assess the material's suitability for upland disposal.

Unfortunately, the information that you have provided is not adequate for us to make such an assessment. Some months ago, Mr. Larry Oliver, ACOE Engineering and Planning Division, provided this Department with a description of a sediment chemistry testing plan for Boyd's Marsh and requested our comments on the adequacy of the sampling. RIDEM responded, in a February 15, 1999 letter addressed to Mr. Oliver (copy enclosed), that more than three sediment samples would likely be required and that more than one TCLP would most likely be needed to characterize the quantity of sediment to be dredged. The results sent to us with your September 10, 1999 letter indicate that only three sediment samples were taken and that only one TCLP was performed for a total volume of sediment which may exceed 204,000 cubic yards.

These samples and test do not appear adequate to make the assessment of suitability for upland disposal that you request.

Based upon the limited sediment testing performed, the TPH values fall into the Class III range. All other contaminant concentrations are below applicable regulatory standards in the test results submitted. Provided that further testing yields similar results, it appears that this proposal is eligible for RIDEM's Office of Waste Management review for disposal at upland locations. Other aspects of the project (filling of state water and dredging) require both the 401 Water Quality Certification and the State Water Quality Certification.

RIDEM will continue its review of the sediment disposal issue upon receipt of the Water Quality Certification Application. A copy of this application is provided for your use.

Kindly feel free to contact me, or Carolyn Weymouth, of my staff, should you have questions or if we can be of assistance. I can be reached at (401) 222-4700, x-7500 and Carolyn at (401)222-4700, x-4422.

Sincerely,

Ronald Gagnon

Ronald Gagnon, Chief
Office of Technical and Customer Assistance

cc: T. Gray, R. Ribb, E. Szymanski,

Larsen

Larsen/kab/78113

September 10, 1999

Engineering/Planning Division
Planning Branch

Mr. Ronald Gagnon
State of Rhode Island and Providence Plantations
Department of Environmental Management
Office of Technical and Customer Assistance
235 Promenade Street
Providence, Rhode Island 02908

Dear Mr. Gagnon:

The U.S. Army Corps of Engineers, New England District, has conducted a sampling and testing program for the material we propose to excavate as a consequence of environmental restoration plans formulated for Boyd's Marsh in Portsmouth, Rhode Island.

Many of the plans under consideration would produce more material that could be disposed of on site, so the identification of a disposal site will be an important factor in the selection of a restoration plan. Onsite, we anticipate a disposal capacity of 19,000 cubic meters (25,000 cubic yards). We currently estimate that a volume of material ranging from 55,000 to 120,000 cubic meters (72,000 to 157,000 cubic yards) will need to be disposed of offsite.

We have had discussions with the town of Tiverton regarding their landfill, which has been identified as a logical site for disposal of some of the material to be excavated. We have sent the test results to the town and asked them to indicate whether or not the material is suitable for disposal at the town landfill.

Ultimately, the use of any of this material at an upland disposal site will be based on Department of Environmental Management approval. We have enclosed the sampling plan and the results of our tests.

In general, the testing confirmed our initial expectations for the material. Improvement dredging material normally does not carry significant concentrations of contaminants. The results of the tests show concentrations of potential contaminants are mostly below detection limits and, with one exception, are below all applicable regulatory standards. Concentrations of total petroleum hydrocarbons (TPHs) exceed the Rhode Island Department of Environmental Management criterion for

Class III dredged material. Since it did not violate the TCLP criteria, the material would not be considered a Hazardous Waste. However, according to the Department's Dredged Materials Disposal Requirements, the material would be considered a solid waste because tests exceeded the criterion for TPHs.

As you can see in the enclosed tables, the concentrations for TPHs exceed the Class III criterion in three samples. This result is somewhat inconsistent given the source of the material and results for the other constituents, in particular the low concentrations of polycyclic aromatic hydrocarbons. High measured concentrations of TPHs can result from the presence of naturally occurring gums and oils not related to man-made contaminants and without the potential for adverse effects.

To further consider these results, our chemist obtained and reviewed the chromatograms for the samples. Although the results were correctly reported as within the range for gasoline range organics, diesel fuel and motor oil, none of the chromatograms for the samples exactly matched the chromatograms for gasoline, diesel fuel, or motor oil. We cannot conclusively determine whether the concentrations reported for TPHs result from man-made oils and grease, or naturally occurring substances. However, given the source of the material, the lack of any obvious source of contamination, and the results showing very low levels of contamination from other man-made sources, we feel this is suitable for disposal in the landfill.

Please review the test results and provide your assessment of the material's suitability for upland disposal.

If you have any questions or need further information, please contact the study manager, David Larsen, at (978) 318-8113.

Sincerely,

John R. Kennelly
Deputy Chief, Engineering/Planning Division

Enclosure

CF:
Mr. Larsen
Mr. Oliver

NK 9/10
for C/PPS

C/PL BR JK 9/10

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

HISTORICAL PRESERVATION & HERITAGE COMMISSION

Old State House • 150 Benefit Street • Providence, R.I. 02903-1209

Preservation (401) 222-2678 FAX (401) 222-2968
Heritage (401) 222-2669 TDD (401) 222-3700

April 12, 1999

Mr. Kenneth E. Hitch
Chief
Engineering/Planning Division
NED, U. S. Army Corps of Engineers
Regulatory Division
696 Virginia Road
Concord, MA 01742-2751

Re: Restoration of Boyd's Marsh
Portsmouth

Dear Mr. Elliott:

The Rhode Island Historical Preservation Commission has reviewed the above-referenced proposal in accordance with the National Historic Preservation Act.

The project will have no effect on any property listed on or eligible for listing on the National or State Registers of Historic Places. Therefore, we have no objections.

These comments are provided in accordance with Section 106 of the National Historic Preservation Act. If you have any questions or comments, please contact Richard E. Greenwood, Project Review Coordinator of this office.

Very truly yours,

Richard E. Greenwood

for Edward F. Sanderson,
Executive Director
Deputy State Historic
Preservation Officer

(H:1)

March 25, 1999
224 Heritage Drive
Portsmouth, RI 02871

Michael W. Pratt
Colonel, Army Corps of Engineers
District Engineer
New England District
696 Virginia Rd.
Concord, MA 01742-2751

Dear Colonel Pratt:

We are sending this letter to ensure there is a clear and permanent record of the comments and concerns of the abutting residential property owners to the planned restoration of Boyd Marsh.

We would like to support the Boyd Marsh Restoration Project but believe we must take a position that ensures our present natural environment, privacy, security and financial investment are protected. We, as abutters to the proposed restoration project, believe that certain safeguards of our property and privacy must be protected.

We had been told we would be informed of, and included in, any meetings concerning this project. The recent meeting with the Portsmouth Town Council on 3 March 1999, as reported in the local newspaper, was held without prior notice to the parties affected by this project. As abutters we have concerns that certain versions of this plan may effect our immediate home environments.

There is an abundance of wildlife that presently use the waterway and berm area for food, shelter, and nesting. This sanctuary must not be destroyed under the guise of ecological restoration.

The berm area, with its mature trees and undergrowth provides a buffer area and privacy screen to help shield the homes from noise, light, and intrusion from the Anthony Road Bay Point Conference Center and Route 24 traffic activity. To remove this natural buffer would be counter productive. Additionally if a plan is adopted which includes a road, trail, or pathway of some sort in the restored area, it seems invasive and punitive to locate it adjacent to the present berm and residential area when it could just as easily be built on the present electric pole maintenance road or along the uninhabited side of the marsh by the Montaup Country Club.

The concern of the possibility of rising home insurance rates due to the proximity of a newly developed tidal effected waterway persists. The "50 year" and "100 year" flood levels and a hurricane surge level through the restored marsh area could cause abutting areas to flood easier.

The present neighborhood is a close knit, established enclave. Changes in the berm environment and status could have a significant negative impact. We will do all in our power, up to and including legal action, to ensure the present berm area is not altered. A restoration project should not place the safety, privacy or financial security of residents at risk.

We have extended an open invitation to the official agencies involved to visit the neighborhood, which has thus far not been accepted. We question the commitment of these federal, state, and town representatives to the concerns of the abutters when a site visit did not seem important; **actions speak louder than words**. A site visit by decision makers would be an appropriate action to ensure the best possible alternative for all involved is selected. In view of the fact that the map used for the presentations thus far, still, after a year of request by the taxpayers involved, do not indicate the existence of houses on the abutting property, we seriously doubt informed, intelligent decisions can be made without a vision of the actual environment.

We request the agencies and decision makers responsible for this proposed project consider the human element of this ecological environment.

Anna W. Dewick
Anna Dewick 224 Heritage Dr.

Charles T. Dewick

Mary E. Fournier
174 Heritage Dr.

Susan Bott
[illegible] Heritage Dr

[illegible]
194 Heritage Dr.

[illegible] T. F. Cuccia
164 Heritage Dr

cc:
RI Department of Environmental Management
RI Coastal Resources Management Council
Town of Portsmouth, Rhode Island

John Cyphers
204 HERITAGE DR

Diane L. Cyphers

Patricia E Davis
214 Heritage Dr

Mary T. Mason
214 Heritage Dr.

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Tiverton, Rhode Island, United States
Photographed on 29 Mar 1995

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Microsoft SQL Server

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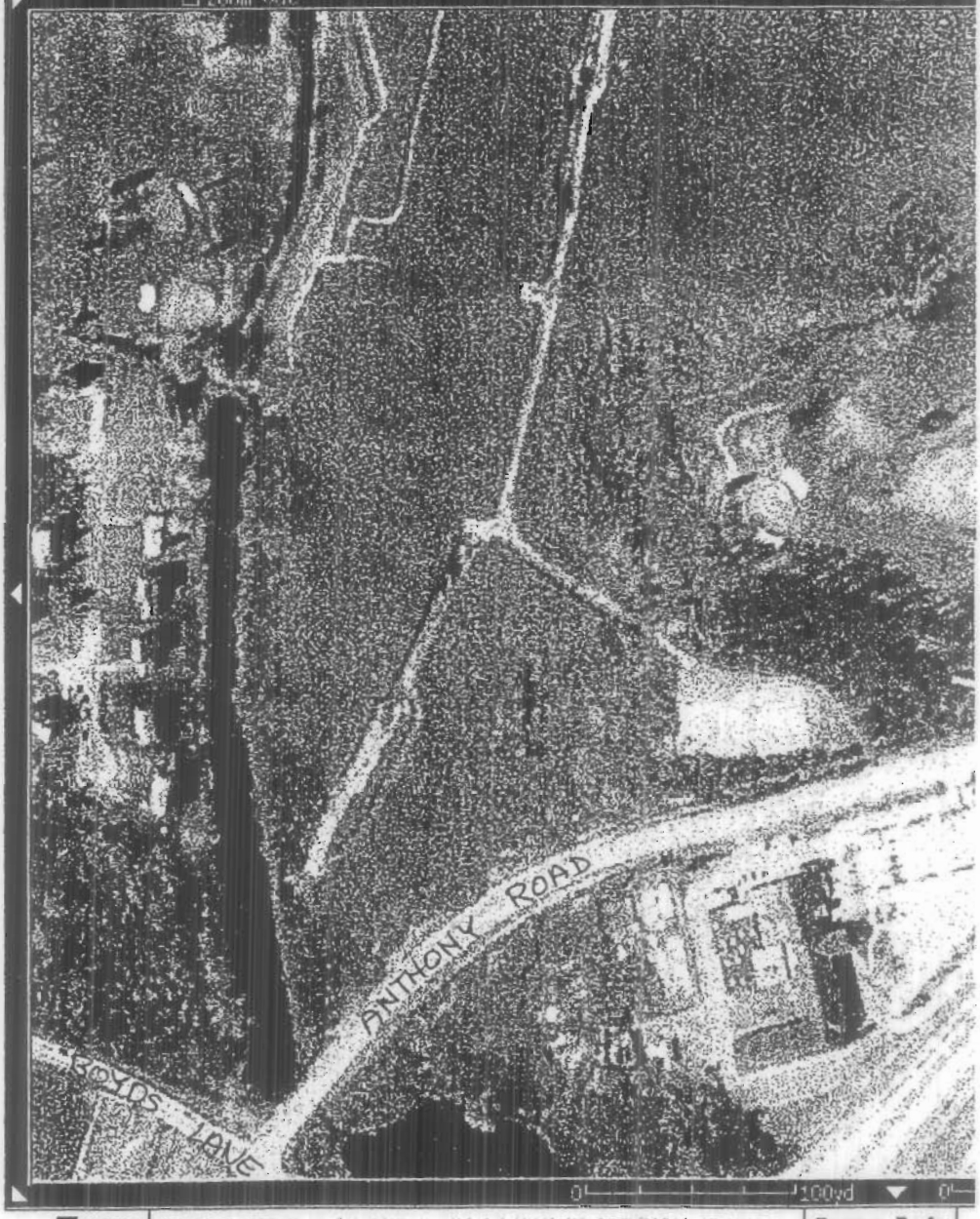
View Map | Window Size: Small | Medium

Zoom out | 1km



Home | Image Info

Page built with 26 Database queries Page Imag
Photograph courtesy of the United State

Note:

Sattelite View of Heritage Drive, abutters Homes, fresh water area and berm. (Photographed on 29 March 1995) Can be found on Web site--www.terraserver.microsoft.com/

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
JOHN F. KENNEDY FEDERAL BUILDING
BOSTON, MASSACHUSETTS 02203-0001

March 16, 1999

Colonel Michael W. Pratt
District Engineer
New England District
U.S. Army Corps of Engineers
696 Virginia Road
Concord, Massachusetts 01742-2751

Dear Colonel Pratt:

This letter is in reference to the Army Corps of Engineers, New England District investigation for evaluating alternatives to restore salt marsh and estuarine habitat at Boyd's Marsh in Portsmouth, Rhode Island under Section 1135 of the Water Resources Development Act of 1986.

The purpose of the evaluation is to restore degraded estuarine habitat/salt marsh to pre-disturbance conditions in the hopes of gaining water quality and wildlife improvements. The majority of Boyd's Marsh within the area proposed for restoration contains degraded freshwater habitat dominated by common reed. The degraded condition was caused by the elimination of tidal flooding and filling with dredged material from the early 1950's.

EPA is pleased to participate in the evaluation effort to identify appropriate marsh restoration alternatives. The Environmental Protection Agency has been working with local , state and federal agencies to increase such coastal habitat restoration projects. We have already begun constructive participation in this improvement project with members of your staff (Mr. Larry Oliver) on selection of a preliminary sediment sampling plan.

Thank you for the opportunity to comment on this project. We look forward to selection of an alternative that will help implement the restoration of this salt marsh and help to improve coastal salt marsh habitat in Rhode Island. If you have any question, please contact Melvin P. Holmes of my staff at (617) 918-1397.

Sincerely,

Robert E. Mendoza, Director
Rhode Island State Program

POCASSET COUNTRY CLUB

March 16, 1999

Mr. Michael W. Pratt, Colonel
US Army Corps of Engineers
New England District
696 Virginia Road
Concord, MA 01742-2751

Dear Mr. Pratt:

Pocasset Country Club "PCC" is an adjacent property owner to Boyd's Marsh. As an interested party, PCC has reason for concern regarding potential aspects of the proposed restoration project.

PCC is worried that particulars of the proposed restoration project could decrease the value of the business. As a business, PCC's property is not only valued by its land holdings, but also by its business revenue.

Founder's Brook is the golf course's only irrigation source. Any adverse effects to the brook's current flow rate, flow quantity, quality or salinity level of the brook could damage the property and the business.

PCC is concerned that the proposed project's systems, structures or vegetation may adversely affect the property's natural surface water drainage and subsurface water drainage during periods of rain, snow-melt runoff, high tides or storm surges, decreasing the property's value and the business's value.

Part of PCC's value is attributable to its view of the marsh. PCC's property value and business value would decrease if the proposed project's new systems, structures or vegetation impede the view of the marsh any more than in its current condition.

Any proposed use of the golf course property for restoration activities, i.e., operation/storage of equipment/materials, or as a point of access/egress to the project, could have a serious effect on the golf course and its operations.

During the November 16, 1998, meeting hosted by the Department of the Army's, Corps of Engineers, New England District, regarding this proposed restoration plan, a nature trail was tentatively proposed along the border between the marsh and PCC. If this nature trail is approved, PCC would be concerned that the trail lacks adequate systems to control hikers and to protect the golf course property from damage, trespassing, littering and vandalism.

Please keep us informed as the plans for the project progress so that we can continue to have the opportunity to comment on those aspects of the plan which might impact our property.

Sincerely,

David A. Rosow, Jr.
Vice President

807 BRISTOL FERRY RD PORTSMOUTH, RI 02871

TELE. (401) 683-7300 FAX. (401) 683-2930

Town of Portsmouth

2200 East Main Road / Post Office Box 155 / Portsmouth, Rhode Island 02871-0155

Robert G. Driscoll
Town Administrator

(401) 683-3255
Fax (401) 683-6804

12 March 1999

Mr. David A. Larsen, Civil Engineer
US Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Re: Boyd's Marsh Restoration Project

Dear Dave:

Harry Chase, a local farmer whose family once owned a farm which abutted Boyd's Marsh when it was known as Town Pond, has told me that he has home movies showing the condition of Town Pond before it was filled in and in brief snippets some of the work being done filling in the marsh. If there is any utility in viewing these films please let me know and I will put you in touch with Mr. Chase.

Yours truly,

Robert G. Driscoll
Town Administrator

RGD/bam

Town Council
of the
Town of Portsmouth

2200 East Main Road / Portsmouth, Rhode Island 02871

9 March 1999

Colonel Michael W. Pratt
US Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

ATTN: Environmental Resources

Re: Restoration of Boyd's Marsh

Dear Col. Pratt:

The Portsmouth Town Council has voted to endorse the concept of restoring Boyd's Marsh and is committed to continue to work with the Army Corps of Engineers in the development and review of alternative modes of restoration. This is a valuable project and we are happy to see that progress is being made on it. The Town reserves the right to make further and additional comments as the plans for the project are developed. With best wishes,

Yours truly,

Stephen P. Pappas, President
Portsmouth Town Council

SPP/bam

TOWN OF TIVERTON, RHODE ISLAND

James C. Goncalo
Town Administrator

March 1, 1999

Department of the Army
New England District, Corps of Engineers
696 Virginia Road
Concord, MA 01742

Attn: Mr. David Larson

Re: Boyds Marsh Restoration Project

Dear Mr. Larson:

Thank you for your letter of January 26, 1999 and a copy of the preliminary sampling plan for the Boyds Marsh Sampling Plan. Tiverton appreciates the cooperation of both the Corps and Portsmouth in attempting to provide us with this potentially very useful product.

We forwarded your sampling plan to our engineer and asked if there were any other tests that they might recommend that would allow us to meet DEM requirements to use the dredged material for our landfill operation. I have included their comments for your review.

Please consider their recommendations and provide me with your comments! Once again, thank you for your cooperation.

Sincerely,

JCGoncalo

James C. Goncalo
Town Administrator

File: h\dredge

Town Hall · 343 Highland Road · Tiverton, Rhode Island 02878-4499 · Phone (401) 625-6710 · Fax (401) 625-6777

Printed on Recycled Paper

PARE ENGINEERING CORPORATION
Engineers — Planners — Consultants

February 3, 1999

Mr. John Ratcliffe
Public Works Director
Tiverton Public Works
50 Industrial Way
Tiverton, RI 02878-3128

RE: Tiverton Sanitary Landfill
Alternate Cover Material
Boyd's Marsh Dredging
PARE Project No. 94139.01

Dear Mr. Ratcliffe:

I am in receipt of your correspondence pertaining to the use of dredge spoils from the Army Corps of Engineer's dredging project at Boyd's Marsh in Portsmouth, RI. It is proposed that this material be considered for use as cover at the Town's Sanitary Landfill.

I agree that the Town should entertain proposals for receipt of cover material from various offsite sources, as onsite sources are limited, however it is critical that appropriate inquires be conducted to insure the materials suitability. As you are aware, the landfill maintains a quarterly groundwater monitoring program mandated by State Solid Waste Regulations. Any material that has the potential to degrade groundwater quality should be closely scrutinized before acceptance. The suitability of a material can only be determined through extensive analytical testing. Finally, once a material is determined suitable, a petition for its use must be made to the RIDEM.

We have reviewed the information provided and offer the following for consideration.

- The proposed analytical testing program appears comprehensive. It is critical that the TCLP (toxicity characteristic leaching procedure) analysis for metals be performed. This is a test that attempts to predict how contaminants will leach in a landfill type environment. Currently, only one of the seven samples is proposed for TCLP analysis. Given the volume of material involved, the TCLP analysis should be expanded to include all seven samples. Especially when considering the statement that the material is expected to have a much higher percentage of silt and clay and thus a greater potential to hold contaminants.

- The Town should premise its consideration for acceptance of this material on favorable test results and ultimately RIDEM approval. A high silt and clay content may make this material undesirable due to problems with handling, spreading and compacting.

8 Blackstone Valley Place, Lincoln, RI 02865 • 401-334-4100 • fax: 401-334-4108 • e-mail: pare@parecorp.com

- The material should be properly dewatered before delivery to the site. Material that is not dewatered will be difficult to handle given the available personnel and equipment that the Town maintains at the landfill.

- I would suggest that if the material were ultimately found suitable, that a limited amount be accepted initially on a trial basis. If found acceptable, arrangements for larger quantities can be made.

- The material would be used as "initial" cover, which is cover that is applied to the working face on a daily basis. The volume accepted should be based upon a determination of an amount that can reasonably be stored and utilized over the period of the project.

- The suitability for use as final closure cover can also be considered, however the landfill facility has an expected remaining life of over ten years. If it were to be used for final capping, the material would require long-term storage.

In summary, we believe that the acceptance of this material should not be discounted at this point. However, at this time there is insufficient documentation to make an informed decision. When further analytical data becomes available, a final decision can be rendered.

Please do not hesitate to contact the undersigned should you have any questions regarding this matter.

Sincerely,

Russell L. Houde, P.E.
Senior Project Engineer

RLH/dp

cc: Thomas B. Nicholson, P.E., PARE

Z:\Environmental\94139.00\Corresp\ALTCOVER-LBT.doc

Public Notice

Army Corps
of Engineers
New England District
696 Virginia Road
Concord, MA 01742-2751

Date: March 1, 1999
Comment Period Closes: March 31, 1999

RESTORATION OF BOYD'S MARSH
UNDER SECTION 1135 OF THE
WATER RESOURCES DEVELOPMENT ACT OF 1986
PROJECT MODIFICATIONS FOR THE IMPROVEMENT OF THE ENVIRONMENT

PORTSMOUTH, RHODE ISLAND

Interested parties are hereby notified that the U.S. Army Corps of Engineers, New England District, is conducting an investigation to evaluate alternatives to restore salt marsh and estuarine habitat at Boyd's Marsh in Portsmouth, Rhode Island. (See Figure 1.) This work is being conducted at the request of the Rhode Island Department of Environmental Management. The work is authorized under Section 1135 of the Water Resources Development Act of 1986 (33 U.S.C. 2294 et seq.). Attachment No. 1 lists pertinent laws, regulations and directives.

Project Description: The habitat at the project site historically consisted mostly of salt pond with a relatively small proportion of salt marsh. Disposal of dredged material in the pond in the early 1950's to construct the Fall River Navigation Improvement Project converted the majority of the area from salt pond to common reed (*Phragmites australis*) marsh. The common reed marsh is now above the level of tidal inundation.

Alternatives under consideration include restoration of salt marsh, or a combination of salt pond and salt marsh by grading and excavation. All of the restoration alternatives will require deepening of the existing inlet to the marsh to ensure adequate tidal flow. The inlet supports estuarine habitats including fringing salt marsh that may be disturbed by the deepening. Alternatives will be designed to avoid impacting freshwater in Founder's Brook, adjacent to the west side of the project site.

Alternatives for disposal of the excavated material include disposal on-site, which may require filling of existing wetlands, or offsite disposal at a landfill or one of the two golf courses adjacent to the site. Potential landfill sites are located in Bristol and Tiverton, Rhode Island. Although some fill in wetlands may be necessary, the goal of the project is to maximize restoration of estuarine habitats and minimize wetland filling.

Purpose of the Work: The purpose of this project is to restore estuarine habitat, salt marsh and the associated values of these habitats to fish and wildlife. The majority of Boyd's Marsh within the area to be restored contains degraded freshwater habitat dominated by common reed and freshwater wetland vegetation due to the elimination of tidal flooding and filling with dredged material. Where it dominates large areas of a habitat, common reed is a nuisance species with

relatively low value for fish and wildlife. Grading to lower elevations and restoration of periodic tidal inundation with salt water will restore valuable estuarine habitats.

Additional Information: Additional information may be obtained from Mr. Larry Oliver, New England District, U.S. Army Corps of Engineers, Environmental Resources Section, 696 Virginia Road, Concord, Massachusetts 01742-2751, telephone number (978) 318-8347.

Coordination: The proposed work is being coordinated with the following Federal, State, and local agencies.

U.S. Fish and Wildlife Service
U.S. Environmental Protection Agency
National Marine Fisheries Service
Natural Resources Conservation Service
Rhode Island Department of Environmental Management
Rhode Island Coastal Resources Management Council
Rhode Island Department of Administration, Office of Strategic Planning
Rhode Island Natural Heritage Program
Rhode Island Historic Preservation Office
Town of Portsmouth Rhode Island

Environmental Impacts: An Environmental Assessment and Finding of No Significant Impact will be prepared and will be available for public review upon request. A determination has been made that an Environmental Impact Statement for the proposed restoration project is not required under the provisions of the National Environmental Policy Act of 1969.

Clean Water Act: A Clean Water Act, Section 404(b)(1) evaluation will be completed for the project. State Water Quality Certification will be obtained prior to implementation.

Coastal Zone Management Consistency: A determination regarding the consistency of the project with the approved State coastal zone management program will be provided to the Coastal Resources Management Council prior to implementation.

Endangered Species: Coordination with the U.S. Fish and Wildlife Service and National Marine Fisheries Service will be conducted to determine whether there are Federally listed endangered or threatened species in the proposed project area. Coordination with the Rhode Island Natural Heritage Program will also be conducted to determine whether there are State-listed species in the project area.

Cultural Resources: The proposed work is being coordinated with the Rhode Island State Historic Preservation Officer in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended.

Executive Order 11988 Floodplain Management: This project must be located in the floodplain to achieve the project purpose.

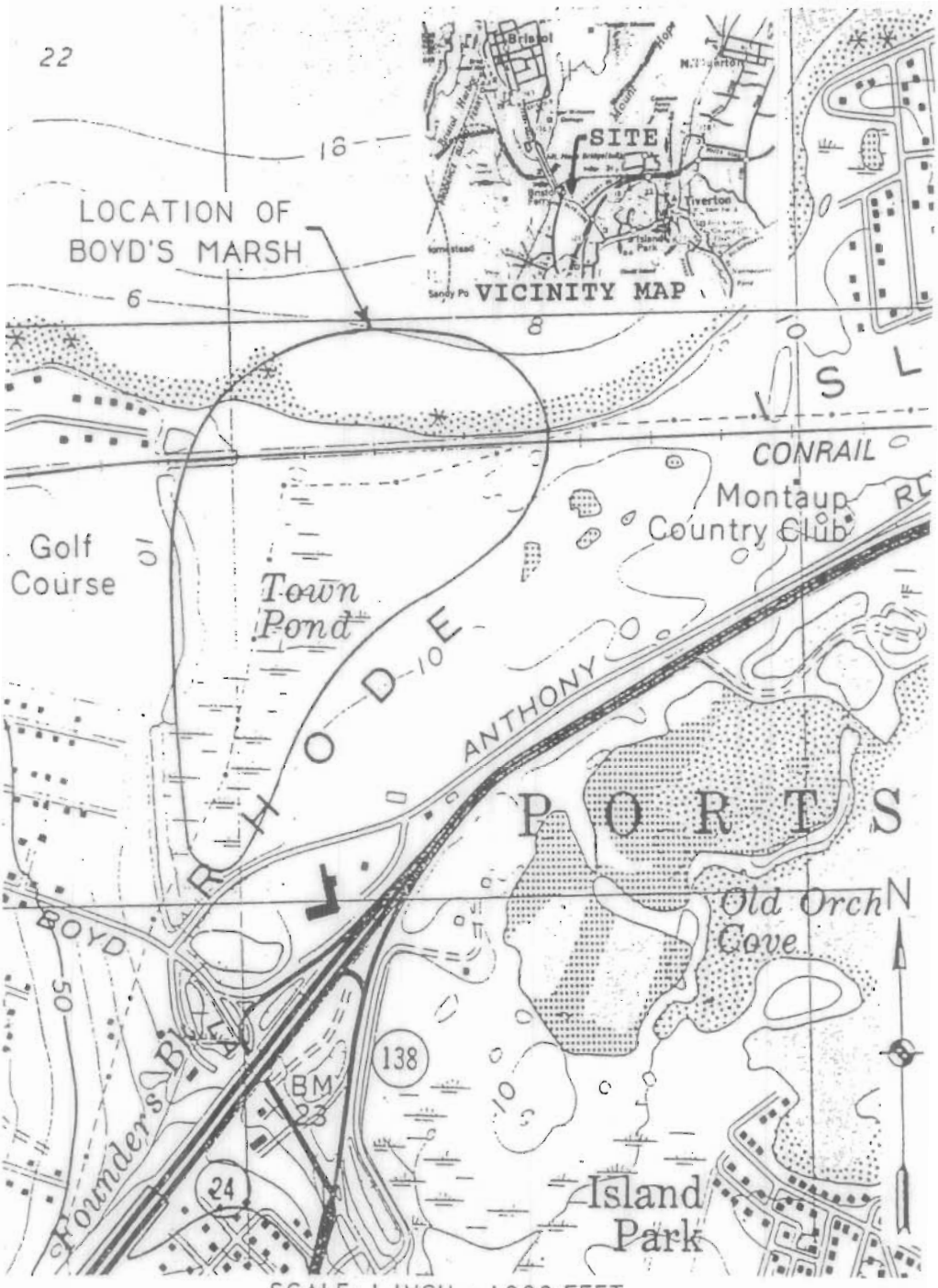
Alternatives: Four alternatives to the proposed action, including the No Action Alternative, are being considered in the study process. If no action is taken by any authority to restore the estuarine habitats, the marsh will continue to exist in its present degraded condition. The improvements in fish and wildlife resource value that would be generated with the project would not be achieved.

The construction alternatives include an alternative that maximizes the area of salt marsh restored, two alternatives that restore mostly salt pond (of different depths) with a fringe of salt marsh, and an alternative with nearly equal amounts of salt marsh and salt pond.

Any person who has an interest that may be affected by the proposed project may request a public hearing. The request must be submitted in writing to me within 30 days of the date of this notice and must clearly set forth the interest that may be affected and the manner in which the interest may be affected by the activity.

Please bring this notice to the attention of anyone you know to be interested in the project. Comments are invited from all interested parties and should be directed to me at 696 Virginia Road, Concord, Massachusetts 01742-2751, ATTN: Environmental Resources Section within 30 days of this notice.

Michael W. Pratt
Colonel, Corps of Engineers
District Engineer



DEPARTMENT OF THE ARMY NEW ENGLAND DIVISION CORPS OF ENGINEERS WALTHAM, MA	SECTION 1135 PORTSMOUTH, RI **BOYD'S MARSH RESTORATION** LOCATION MAP	1/3

FIGURE 1

Attachment 1

PERTINENT LAWS, REGULATIONS AND DIRECTIVES

The proposed activity will be reviewed in accordance with the following laws and executive orders as applicable:

Federal Statutes

Preservation of Historic and Archaeological Data Act of 1974, as amended, 16 U.S.C. 469 et seq.

Clean Air Act, as amended, 42 U.S.C. 7401 et seq.

Clean Water Act of 1977 (Federal Water Pollution Control Act Amendments of 1972) 33 U.S.C. 1251 et seq.

Coastal Zone Management Act of 1972, as amended, 16 U.S.C. 1431 et seq.

Endangered Species Act of 1973, as amended, 16 U.S.C. 1531 et seq.

Estuarine Areas Act, 16 U.S.C. 1221 et seq.

Federal Water Project Recreation Act, as amended, 16 U.S.C. 4601-12 et seq.

Fish and Wildlife Coordination Act, as amended, 16 U.S.C. 661 et seq.

Land and Water Conservation Fund Act of 1965, as amended, 16 U.S.C. 4601-4 et seq.

Marine Protection, Research, and Sanctuaries Act of 1972, as amended, 33 U.S.C. 1401 et seq.

National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470 et seq.

National Environmental Policy Act of 1969, as amended, 42 U.S.C. 4321 et seq.

Rivers and Harbors Act of 1899, as amended, 33 U.S.C. 401 et seq.

Watershed Protection and Flood Prevention Act, as amended, 16 U.S.C. 1001 et seq.

Executive Orders

Executive Order 11988, Floodplain Management, 24 May 1977 amended by Executive Order 12148, 20 July 1979.

Executive Order 11990, Protection of Wetlands, 24 May 1977.

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, 11 February 1994.

Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks, 21 April 1997.

Executive Memorandum

Analysis of Impacts on Prime or Unique Agricultural Lands in Implementing NEPA, 11 August 1980.

U.S. FISH & WILDLIFE SERVICE

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Field Office
22 Bridge Street, Unit #1
Concord, New Hampshire 03301-4986

U.S. Department of the Interior 1849•1999

February 25, 1999

Kenneth Hitch
Evaluation Branch
Engineering/Planning Division
U.S. Army Corps of Engineers
696 Virginia Road
Concord, Massachusetts 01742-2751

Dear Mr. Hitch:

This responds to your January 29, 1999 letter requesting information on the presence of federally-listed and proposed endangered or threatened species in relation to the Section 1135 investigation to consider alternatives to restore estuarine habitat at Boyd's Marsh in Portsmouth, Rhode Island. The following comments are also provided in accordance with the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.).

Based on information currently available to us, no federally-listed or proposed threatened and endangered species under the jurisdiction of the U.S. Fish and Wildlife Service are known to occur in the project area, with the exception of occasional transient bald eagles (Haliaeetus leucocephalus) or peregrine falcons (Falco peregrinus anatum). However, we suggest that you contact Rick Enser of the Rhode Island Natural Heritage Program, 235 Promenade St., Providence, Rhode Island 02908, at 401-222-2776, for information on state-listed species that may be present.

Preparation of a Biological Assessment or further consultation with us under Section 7 of the Endangered Species Act is not required. Should project plans change, or additional information on listed or proposed species becomes available, this determination may be reconsidered. A list of federally-designated endangered species in Rhode Island is enclosed for your information.

At this time, not enough information is available to provide extensive comments on the effects of the proposed alternatives on fish and wildlife resources. However, we recommend that dredged material be taken off-site. The creation of a large on-site disposal area would reduce potential area for salt pond and salt marsh restoration. A 1939 aerial photo, taken prior to the area being filled, shows this area was mostly open water. We believe you should consider restoring at least 50% of the area to pre-1939 conditions. We recommend at least a 50/50 mix of open water and marsh vegetation to increase diversity and maximize fish and wildlife values of the site.

We recommend that you reconsider the need for the proposed berm because a berm would result in less available area for habitat restoration. The tradeoffs between keeping the berm and not keeping it need to be evaluated from an environmental perspective. If, following reevaluation of its impact, a berm is required, some freshwater emergent vegetation should be restored along the freshwater channel to compensate for the area buried by the berm. The close proximity of salt pond/saltmarsh/freshwater/freshwater marsh will add diversity to the site and habitat value for waterfowl, wading birds, saltmarsh nesting birds, and fish.

The Common Fence Point Restoration Project, which is located within 1 mile of the site, is a good model for salt pond and saltmarsh restoration elevations. All of the dredged material at this restoration site was trucked off-site to the Tiverton landfill. It was used as cap material for their landfill.

The restoration plan presently lacks goals. Plans to monitor the restoration should be designed to determine whether agreed-upon goals are met. Monitoring should be conducted for a minimum of five years, and there should be enough flexibility in the plans so that adjustments can be made if goals are not being met. Readjustments may require regrading or replanting to reach desired goals, especially to meet a top priority of phragmites control.

Please contact Greg Mannesto of our Rhode Island Office at (401) 364-9124 if we can clarify our position or if we can be of further assistance.

Sincerely,

Kenneth C. Carr
Acting Supervisor
New England Field Office

Enclosure

CC: Corti Collins, NMFS
Peter Holmes, EPA
Rich Enser, DEM
Reading File
ES: GMannesto:2-25-99:401:364:9124

FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES IN RHODE ISLAND

Common Name	Scientific Name	Status	Distribution
FISHES:			
Sturgeon, shortnose*	Acipenser brevirostrum	E	Atlantic coastal waters and rivers
REPTILES:			
Turtle, green*	Chelonia mydas	T	Oceanic straggler in southern New England
Turtle, hawksbill*	Eretmochelys imbricata	E	Oceanic straggler in southern New England
Turtle, leatherback*	Dermochelys coriacea	E	Oceanic summer resident
Turtle, loggerhead*	Caretta caretta	T	Oceanic summer resident
Turtle, Atlantic ridley*	Lepidochelys kempii	E	Oceanic summer resident
BIRDS:			
Eagle, bald	Haliaeetus leucocephalus	T	Entire state, occasional
Falcon, American peregrine	Falco peregrinus anatum	E	No current nesting; entire state-migratory
Plover, Piping	Charadrius melodus	T	Atlantic coast, Washington and Newport Counties
Roseate Tern	Sterna dougallii dougallii	E	Atlantic coast
MAMMALS:			
Whale, blue*	Balaenoptera musculus	E	Oceanic
Whale, finback*	Balaenoptera physalus	E	Oceanic
Whale, humpback*	Megaptera novaeangliae	E	Oceanic
Whale, right*	Eubalaena spp. (all species)	E	Oceanic
Whale, sei*	Balaenoptera borealis	E	Oceanic
Whale, sperm*	Physeter catodon	E	Oceanic
MOLLUSKS:			
NONE			
INSECTS:			
Beetle, American burying	Nicrophorus americanus	E	Washington
Beetle, northeastern beach tiger	Cicindela dorsalis dorsalis	T	Washington, extirpated
PLANTS:			
Small Whorled Pogonia	Isotria medeoloides	T	Providence, Kent Counties
Gerardia, Sandplain	Agalinus acuta	E	Washington

* Except for sea turtle nesting habitat, principal responsibility for these species is vested with the National Marine Fisheries Service

Rev. 6-15-98

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

235 Promenade Street, Providence, RI 02908-5767 TDD 401-831-5508
Planning & Development
Phone No. 222-2776
Fax. No. 222-2069

Kenneth Hitch, P.E.
Engineering/Planning Division
Army Corps of Engineers
New England District
696 Virginia Road
Concord, MA 01742-2751

February 18, 1999

RE: Boyd's Marsh, Portsmouth, RI.

Dear Mr. Hitch:

Thank you for contacting the Rhode Island Natural Heritage Program for information regarding the presence of endangered or threatened species in the vicinity of Boyd's Marsh, in reference to the proposed project for restoring estuarine habitat in this area.

At the present time, there are no federal or state-listed threatened or endangered species utilizing this site; however, I can offer some historical perspective regarding the presence of several nesting birds at Boyd's Marsh. Some of these species are currently listed as rare species in Rhode Island.

Review of historical data indicates the former importance of the complex of fresh and brackish wetlands at Boyd's Marsh prior to use of the area for both dredge disposal and as a landfill. Although full-scale inventory data is not available, periodic observations by professional and amateur ornithologists reveals the following records during the period of the late 1930's-early 1960's. These include:

1. Pied-billed Grebe. Adult with young at Boyd's marsh, 7/24/1940. This record was one of the last recorded instances of this species nesting in Rhode Island for over 50 years until it was reconfirmed as a nester at Trustom Pond, South Kingstown in 1994.

2. Common Moorhen. Adults with a brood of young through the summer of 1961 and also noted for several prior seasons. Boyd's Marsh was one of only three nesting sites ever confirmed for this species in Rhode Island, and it has not been recorded as a nester in the state since 1961.

3. Green-winged Teal. Never a common nester in Rhode Island (not confirmed for the past decade), but generally thought to nest at Boyd's Marsh at least between the late 1950's through the early 1960's.

In addition to the above, records are also available documenting the presence of Least Bittern, Marsh Wren, and Sora, all currently considered to be Species of Concern in Rhode Island. What is not clear from these records is the exact location of nesting birds. Most of these species are generally associated with fresh/brackish habitats, especially wetlands dominated by narrow-leaved cattail (*Typha angustifolia*), and therefore they may have been generally associated with the former wetlands that existed south of Boyd Lane where the landfill was located. However, it is apparent that the entire fresh/brackish complex that existed from Mount Hope Bay south to the Sakonnet River was an extremely valuable system that served as habitat for a high diversity of species during the first half of the 1900's.

If I can provide any additional information please contact me at the number listed above, extension 4308.

Sincerely,

Richard W Enser

Richard W. Enser, Coordinator
RI Natural Heritage Program

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

235 Promenade Street, Providence, RI 02908-5767 TDD 401-831-5508

February 15, 1999

Mr. Larry Oliver
ACOE/New England District
Engineering & Planning Division
696 Virginia Rd..
Concord, MA. 01742-2751
meter code 100

Dear Mr. Oliver:

The Department of Environmental Management has reviewed the preliminary sediment sampling plan which you have proposed for the restoration project at Boyd's Marsh, in Portsmouth, R.I. I regret to inform you that we can not completely answer your inquiry regarding testing requirements at this time. DEM's Office of Waste Management can only respond to requests for use of alternative cover material which are submitted to them by specific operating landfills. We have the following comments for your consideration at this juncture.

Proposed Disposal Options

For all disposal options, it appears that one TCLP for a total of 204,000 cubic yards of material is not adequate.

For disposal within on-site wetlands, the concern the DEM Water Quality Certification (WQC) Program has is the re-introduction of pollutants into the water column. It appears that the ACOE acknowledges that there may be pollutants in the sediment (see paragraph 3). It is not clear what is meant by the statement that "pollutants could be maintained on-site."

The Department is assuming that open water disposal is not an option.

Any dredged material which is determined to be hazardous will fall under the jurisdiction of the Office of Waste Management's *Rules and Regulations for Hazardous Waste Management.*

If, based on sediment testing, the material is Class 1A or 1 material (any quantity), or Class II and less than 10,000 cubic yards, the WQC Program may review the suitability of the proposed disposal site, as long as the proposed disposal location is on-site or near-shore (within 200' of coastal wetland).

If, based on sediment testing, the material is Class II and more than 10,000 cubic yards, or Class III material, or any material proposed to go to an off-site, upland location, the material will be regulated as solid waste by the Office of Waste Management.

On-Site Disposal

The ACOE should clarify what is meant by "on-site" disposal. This may mean on-site in wetlands or on-site within 200' of coastal wetland (near-shore).

- For proposed disposal in wetland located on-site, the WQC Program will review the suitability of the proposed disposal site. This review would be based on the sediment sampling results. Filling wetlands should not be viewed a viable alternative for disposal without addressing the Antidegradation Policy. Filling of saltmarsh would require a 401 Water Quality Certification review as well as a State Water Quality Certification review under Rule 13 of the State Water Quality Regulations.

- For on-site disposal within 200' of a wetland, the Water Quality Certification will also review the suitability of the proposed disposal site.

- If the proposed disposal location is "on-site" but upland in nature, the Office of Waste Management will provide input on the review of the disposal location.

Sediment Testing

- For the above two disposal locations, based on an estimated volume of 204,000 cubic yards, the WQC program will most likely require more than three sediment chemistry tests and possibly more than one TCLP test. Please note, for Common Fence Point, one composite sample (2 or 3 cores) was required. This was based on a volume of dredge material much smaller than what is being proposed for Boyd's Marsh. Figure 2 of your submission shows a proposal for three bulk sediment tests and one TCLP. As such, more samples will be required for this project.

- It is the WQC Program's policy to base the number and of samples and sampling procedures on the proposed disposal location. The applicant must propose the disposal location prior to the WQC Program's approval of the sampling protocol.

- Page 3 of the sampling plan states that *"The constituents shown in Attachment 3 will be measured in each sample to cover all likely disposal alternatives. (The parameters required for open water disposal, or disposal in wetland are not covered.)"* However, since the parameters shown in attachment 3 are not supposed to cover open water disposal or disposal in a wetland, attachment 3 really only relates to upland disposal, and not "all likely disposal alternatives" unless upland disposal is the only likely alternative. It should be noted that for upland disposal, the Office of Waste Management and/or the RI Resource Recovery Corporation may require more sampling.

- The WQC Program believes that the proposed disposal of dredged material in wetland must be considered in light of the State's Antidegradation Policy. As such, constituents for disposal in wetland must be listed also. Page 2 of your submission, which describes where in wetland the material is likely to be placed,

appears to acknowledge that wetland disposal is a "likely" proposed disposal option.

- It is not clear why a maximum of two layers would be sampled for at S-1 and S-3 and three layers at S-2. The number of layers should dictate the number of samples taken.
- What is the reason for proposing the TCLP at S-2?
- It is not clear what is meant by a "*relatively thin veneer of silt overlying the coarse substrate.*" Also, golf courses, residential and agricultural land uses can be a source of contamination. The WQC Program does not agree that sediment sampling in the inlet cannel north of the railroad embankment is unnecessary. This issue will be considered further during the WQC review.

This concludes DEM's comments at this time. It should be noted that these remarks address the testing requirements of the Department's Water Quality Certification Program only.

Thank you for consulting with DEM on this matter. Please feel free to contact me or Carolyn Weymouth, of my staff, should you have questions.

Sincerely,

Ronald Gagnon

Ronald Gagnon
Chief, Office of Technical & Customer Assistance

cw\RG

cc: T. Gray
T. Walsh

Oliver

Oliver/ja/78347

January 29, 1999

Engineering/Planning Division
Evaluation Branch

Mr. Michael Bartlett
U.S. Fish and Wildlife Service
New England Field Offices
22 Bridge Street, Unit #1
Concord, New Hampshire 03301-4986

Dear Mr. Bartlett:

The U.S. Army Corps of Engineers is conducting a Section 1135 investigation to consider alternatives to restore estuarine habitat at Boyd's Marsh in Portsmouth, Rhode Island. Our partner in this effort is the Rhode Island Department of Environmental Management. The purpose of this letter is to request a list of endangered or threatened species for the project area pursuant to Section 7(c) of the Endangered Species Act of 1973, as amended.

The habitat at the site historically consisted mostly of salt pond with a relatively small proportion of salt marsh. Disposal of dredged material in the pond the early 1950's to construct the Fall River Navigation Improvement Project converted the majority of the area from salt pond to common reed (*Phragmites australis*) marsh. The common reed marsh is above the level of tidal inundation.

Alternatives under consideration to restore the site include restoration of salt marsh, or a combination of salt pond and salt marsh. All of the restoration alternatives will require deepening of the existing inlet to the marsh. The inlet supports estuarine habitats including fringing salt marsh that may be disturbed by the deepening.

Alternatives for disposal of the excavated material include disposal on-site, which may require filling of existing wetland, or offsite disposal at a landfill or one of the golf courses adjacent to the site. The potential landfill sites are located in Bristol and Tiverton, RI. Although some fill in wetlands may be necessary, our goal will be to maximize the restoration of estuarine habitats and minimize wetland filling.

A site location map and site plans for each of the restoration alternatives are enclosed to aid in your review. The potential onsite disposal location is also shown on an enclosure.

Please contact Mr. Larry Oliver of my staff at (978) 318-8347 if you have any questions or require additional information about the project.

Sincerely,

Kenneth Hitch, P.E.
Chief, Engineering/Planning Division

Enclosures

Copy Furnished:

Mr. Ronald Gagnon
Rhode Island Department of Environmental Management
235 Promenade Street
Providence, Rhode Island 02903

CF: Oliver, Hubbard, Larsen, Read File, Eng/Plng Div file ***(c:.frm)***

SAME LETTER SENT TO:

Mr. Michael Bartlett
U.S. Fish and Wildlife Service
New England Field Offices
22 Bridge Street, Unit #1
Concord, New Hampshire 03301-4986

Mr. Doug Beach
National Marine Fisheries Service
One Blackburn Drive
Gloucester, Massachusetts 01930

Mr. Rick Enser
Rhode Island Natural Heritage Program
Department of Environmental Management
235 Promenade Street
Providence, Rhode Island 02903

Oliver

Oliver/78347/ja

January 28, 1999

Engineering/Planning Division
Evaluation Branch

Mr. Grover Fugate, Executive Director
RI Coastal Resources Management Council
Oliver H. Stedman Government Center
Tower Hill Road
Wakefield, Rhode Island 02879

Dear Mr. Fugate:

The U.S. Army Corps of Engineers is conducting a Section 1135 investigation to consider alternatives to restore estuarine habitats at Boyd's Marsh in Portsmouth, Rhode Island. Our partner in this effort is the RI Department of Environmental Management. The purpose of this letter is to formally request your comments on the project prior to completing our environmental assessment.

The habitat at the project site historically consisted mostly of salt pond with a relatively small proportion of salt marsh. Disposal of dredged material in the pond in the early 1950's to construct the Fall River Navigation Improvement Project converted the majority of the area from salt pond to common reed (*Phragmites australis*) marsh. The common reed marsh is now above the level of tidal inundation.

Alternatives under consideration include restoration of salt marsh, or a combination of salt pond and salt marsh by grading and excavation. All of the restoration alternatives will require deepening of the existing inlet to the marsh to ensure adequate tidal flow. The inlet supports estuarine habitats including fringing salt marsh that may be disturbed by the deepening.

Alternatives for disposal of the excavated material include disposal on-site, which may require filling of existing wetland, or offsite disposal at a landfill or one of the two golf courses adjacent to the site. The potential landfill sites are located in Bristol and Tiverton, Rhode Island. Although some fill in wetlands may be necessary, our goal will be to maximize the restoration of estuarine habitats and minimize wetland filling.

A site location map and site plans for each of the restoration alternatives are enclosed to aid in your review. The potential onsite disposal location is also shown on an enclosure.

Please contact Mr. Larry Oliver of my staff at (978) 318-8347 if you have any questions or require additional information about the project.

Sincerely,

Kenneth Hitch, P.E.
Chief, Engineering/Planning Division

Enclosures

Copy Furnished:

Mr. Ronald Gagnon
Rhode Island Department of Environmental Management
235 Promenade Street
Providence, Rhode Island 02903

CF: Oliver, Hubbard, Larsen, Read File, Eng/Plng Div file ***(c:.frm)***

SAME LETTER SENT TO:

Mr. Grover Fugate, Executive Director
RI Coastal Resources Management Council
Oliver H. Stedman Government Center
Tower Hill Road
Wakefield, Rhode Island 02879

Ms. Carolyn Weymouth
Department of Environmental Management
Office of Environmental Coordination
235 Promenade Street
Providence, Rhode Island 02903

Ms. Alicia M. Good, Director
Division of Water Resources
Department of Environmental Management
235 Promenade Street
Providence, Rhode Island 02903

Mr. Robert Mendoza
Environmental Protection Agency
Rhode Island State Office
J.F.K. Federal Building
Boston, Massachusetts 02203-2211

Mr. Kevin Nelson
Department of Administration
Office of Strategic Planning
One Capitol Hill
Providence, Rhode Island 02908

Mr. Robert Driscoll
Town of Portsmouth
Town Hall
2200 E. Main Road
Portsmouth, Rhode Island

Olivia
Coal Bn

Larsen/eml/78113

January 26, 1999

Engineering/Planning Division
Planning Branch

Mr. James Goncalo
Town Administrator
Town of Tiverton
343 Highland Road
Tiverton, Rhode Island 02878

Dear Mr. Goncalo:

The U.S. Army Corps of Engineers, New England District, is performing a feasibility study for an environmental restoration project at Boyd's Marsh in Portsmouth, Rhode Island. The restoration of salt marsh or salt pond habitat will be accomplished by grading and reintroducing tidal exchange into areas of the marsh that had been filled with dredged material in the early 1950s. The Rhode Island Department of Environmental Management (RIDEM) has stated its intent to be the non-Federal sponsor for the project.

Tiverton's landfill has been identified as a candidate site for disposal of some of the material that would be excavated for the restoration project. New England District soon plans to conduct sampling and testing of the material at Boyd's Marsh. Our preliminary program, as proposed, calls for up to seven samples to be tested for the analytical parameters shown on attachment 3 of the enclosure and one sample for TCLP analysis: volatile organic compounds, semi-volatile organic compounds, RCRA metals, pesticides, PCBs, and cyanide.

Is there any other testing criteria or requirement that the town of Tiverton requires for material to be accepted at its landfill? Please advise us if there are further requirements, and provide information in sufficient detail so that it can be considered when we perform our sampling and testing.

If you have any questions or need further information, please contact the Study Manager, David Larsen, at (978) 318-8113.

Sincerely,

Kenneth E. Hitch, P.E.
Chief, Engineering/Planning Division

Enclosure

CF:
Mr. Larsen, Plng Br
Mr. Oliver, Eval Br
Reading
Eng/Pln Div Files (Larsen: boydlet6)

Oliver/ja/78347

January 26, 1999

Engineering/Planning Division
Evaluation Branch

Mr. Michael Bartlett
U.S. Fish and Wildlife Service
New England Field Offices
22 Bridge Street, Unit #1
Concord, New Hampshire 03301-4986

Dear Mr.Bartlett:

The U.S. Army Corps of Engineers is conducting a Section 1135 investigation to consider alternatives to restore estuarine habitat at Boyds Marsh in Portsmouth, Rhode Island. Our partner in this effort is the Rhode Island Department of Environmental Management. The purpose of this letter is to formally request your comments on the project pursuant to the U.S. Fish and Wildlife Coordination Act of 1934, as amended.

The habitat at the project site historically consisted mostly of salt pond with a relatively small proportion of salt marsh. Disposal of dredged material in the pond in the early 1950's to construct the Fall River Navigation Improvement Project converted the majority of the area from salt pond and salt marsh to common reed (*Phragmites australis*) marsh. The common reed marsh is above the level of tidal inundation.

Alternatives under consideration include restoration of salt marsh, or a combination of salt pond and salt marsh by grading and excavation. All of the restoration alternatives will require deepening of the existing inlet to the marsh. The inlet supports estuarine habitats including fringing salt marsh that may be disturbed by the deepening.

Alternatives for disposal of the excavated material include disposal on-site (which may require filling of existing wetland), or offsite disposal at a landfill or one of the golf courses adjacent to the site. The potential landfill sites are located in Bristol and Tiverton, Rhode Island. Although some fill in wetlands may be necessary, our goal will be to maximize the restoration of estuarine habitats and minimize wetland filling.

A site location map and site plans for each of the restoration alternatives are enclosed to aid in your review. The potential onsite disposal location is also shown on an enclosure.

Please contact Mr. Larry Oliver of my staff at (978) 318-8347, if you have any questions or require additional information about the project.

Sincerely,

Kenneth E. Hitch, P.E.
Chief, Engineering/Planning Division

Enclosures

Copy Furnished:

Mr. Ronald Gagnon
RI Department of Environmental Management
235 Promenade Street
Providence, Rhode Island 02903

CF: Oliver, Hubbard, Read File, Eng/Plng Div File, ***(fwcoord)***

SAME LETTER SENT TO:

Mr. Michael Bartlett
U.S. Fish and Wildlife Service
New England Field Offices
22 Bridge Street, Unit #1
Concord, New Hampshire 03301-4986

Mr. Peter Colosi
National Marine Fisheries Service
One Blackburn Drive
Gloucester, Massachusetts 01930

Mr. John Stolgitis, Chief
Department of Environmental Management
Division of Fish and Wildlife
Oliver H. Stedman Government Center
4808 Tower Hill Road
Wakefield, Rhode Island 02879

USDA

United States
Department of
Agriculture

Natural
Resources
Conservation
Service

60 Quaker Lane, Suite 46
Warwick, RI 02886-0111
401-828-1300 (Phone)
401-828-0433 (FAX)

Nov. 25, 1998

Mr. Larry Oliver
Biologist
US Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

RE: Boyd's Marsh Restoration Project, Portsmouth, RI

Dear Larry:

As you and I discussed on the phone several days ago, I have a copy of the railroad track plan for the section of rail line that crosses Boyd's Marsh in Portsmouth, RI. Enclosed is a copy of that track plan. Please note the existing rail bridge at the site is labeled "Town Pond Tideway" and is located at mile post 44.93. The plan shows that a "48 in. Armco pipe" was located at mile post 45.05. This 48" culvert might still exist. This culvert is shown to be located 0.09 mile (approx. 475 ft.) west of the existing bridge. I'm not sure if this information is of any value, but I offer it for what it is worth.

I spoke with Jim Turenne, Soil Scientist with NRCS in West Wareham, MA, regarding possible use of the NRCS ground penetrating radar at the Boyd's Marsh project. Jim will be contacting you directly to discuss this possibility in more detail.

We look forward to the possibility of partnering with the Corps on this interesting project.

If you have any questions please contact me at (401) 822-8830.

Sincerely,

Everett Stuart

Everett Stuart
Soil Scientist

N.FAST. REG. NEWPORT SEC. TRK. MP 10.0-MP 0

Newport Secondary Rail Line Track

Scale

Town of Portsmouth

2200 East Main Road / Post Office Box 155 / Portsmouth, Rhode Island 02871-0155

Robert G. Driscoll
Town Administrator

(401) 683-3255
Fax (401) 683-6804

11 January 1999

Mr. David Larson
Dept. of the Army
New England District Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Re: Boyd's Marsh Project

Dear Mr. Larson:

I am happy to report that the Town of Tiverton, Rhode Island is interested in receiving any dredge material from the Boyd's Marsh project which cannot be utilized on-site as long as the material is suitable for landfill cover. At this time Tiverton's commitment is open ended in terms of the amount of material they will be able to accept, and I have promised to keep them advised on the status of this project. With best wishes,

Yours truly,

Robert G. Driscoll
Town Administrator

RGD/bam

CHRISTIE MOSQUITO CONTROL
36 Ewing Road, North Kingstown, RI 02852-2020
Tel. (401) 885-7055
Fax (401) 885-0877
E-Mail: chripest@ids.net

24 November 1998

Larry Oliver
New England Division, Corps of Engineers
696 Virginia Road
Concord MA 01742-2751

Dear Larry,

It was a pleasure meeting you at the November 16th meeting regarding restoring the Boyd's Lane marsh in Portsmouth, RI.

As I told you at the meeting, I have done extensive mosquito-control work in the marsh. I have collected *Aedes cantator, Aedes vexans, Culex pipiens,* and *Culex restuans*. The primary problem mosquito is spring-breeding *Aedes cantator*, which can breed at densities of thousands per square foot in the areas directly under the power lines.

Over the past decade Portsmouth has tried aerial applications and ground treatments to get control. Aerial applications worked but only one helicopter company was willing to do the work at a reasonable cost and, when they chose to stop doing this type of work, the aerial applications ended. Ground applications dent, but do not stop, breeding.

From a mosquito-control perspective, a restoration project to either create salt marsh or salt pond, would be very beneficial.

Thank you,

George D Christie

George D. Christie

Boyd's Marsh / Portsmouth, RI
Working Group Meeting 11-16-98
Attendance

Name	Organization	Telephone / e-mail
David Larsen	US Army Corps of Engineers	DAVID. A. LARSEN @ USACE. ARMY.
Heather Sullivan	"	(978) 318-8113 HEATHER. SULLIVAN @ [illegible] -854
LARRY OLIVER	"	LAWRENCE. R. OLIVER @ USACE ARMY. MIL 978-318-8247
Greg MANNESTO	US Fish and Wildlife Ser.	401 364 9124 GREG_MANNESTO @ FWS. GOV
Al Gettman	DEM Mosquito Abate.	(401) 222-6151
George Christie	Town of Portsmouth	Chripest@ ids.net 885-7055
Andy Lipsky	Save The Bay	401-272-3540 habitat@ savethebay.org
Carolyn Weymouth	RIDEM/OTEF	(401) 222-4700, x-4123
Charles C. Allin	DEM/Fish & Wildlife	222-1267
Brian C. TEFFT	DEM Fish + Wildlife	222-1267
ROBERT HARVEY	EUA - NEWPORT ELEC	508-559-2000 X 3350
Wenley Ferguson	Save The Bay	401-272-3540
THURSTON L. GRAY	PORTSMOUTH RESIDENT	401-847-8676
MIL KINSELLA-SULLIVAN	A/LT	SENDS HER REGRETS
JOSEPH FIACHAND	RI NRCS	401-822-8818
Everett Stuart	USDA - NRCS	401-822-8830
JERRY CULVER	Portsmouth Resident - Bretton Heritage Dr	401-683-6549
Pat DAVIS	Portsmouth Resident	(401) 683-3253
Mary E. Cournoyer	Portsmouth Resident 194 Heritage Dr.	(401) 683-6484
Alex Cournoyer	" " "	" " "
CHUCK DECOICK	" " CTY "	" " 5571
TOM ARDITO	RIDEM NARRag. BAY ESTUARY PROGRAM	222-3961 EXT. 7237 ARDITO@ EARTHLINK. NET
CHRIS DEACUTIS	RIDEM NBEP	222-3961 x7270 deacutis@ uriacc. uri. edu
Melvin Peter Holmes	U.S. EPA Region I RI Unit	617 565-3605 Holmes. Peter@ EPAMAIL. EPA. G
CHIRD RITB	RIDEM/NBEP	222-3961 x7271 rritb@ dem. state. ri. us
Robert DRISCOLL	TOWN OF PORTSMOUTH	683-3255 Town of Ports.

Name	Organization	phone/email
D. CAPOBIANCO		401-683-1580
Jane Capobianco		401-683-1580
RON GAGNON	RI DEM/OCA	222-6522-X7500
Nally Felag	State Senate Elect-Dist. 46	849-5952 *3453
CHARLES LAMBERSON	STATE REPRESENTATIVE	683 9194
Helen Cottrell	RIDEM/Narr. Bay Estuary Program	401-222-4700 X7273
DAVID ROSOW	BERNARD/POCASSET INVESTMENT	203/259-7272
Kevin Nelson	RI Statewide Planning Prog.	222-2093
Ken Tremblay	181 CHASE Rd Portsmouth, RI	687-4800
DAVE REGAN	EASTERN UTILITIES	1508 678 2234 X3324
DAVE REGAN NATIONAL SECRETARY	TIVERTON ROD & GUN CLUB P.O. BOX 115 TIVERTON, R.I. 02878	1401 624 6847

CENAE-EP-EE (1105-2-10)

23 October 1998
Oliver/78347/ja

MEMORANDUM FOR THE RECORD

SUBJECT: Boyds Marsh Restoration Project Coordinated Site Visit

1. **DATE OF MEETING**: 20 October 1998

2. **LOCATION**: Boyds Marsh Project Site

3. **PARTICIPANTS**: See attached sign-in sheet

4. **REPORT**: This meeting was held to explain the Boyds Marsh Restoration Project and alternatives to environmental agencies and others and allow them to see the project site. We provided the people that attended the meeting with draft copies of alternative plans and copies of 1939 and 1996 aerial photographs of the site.

I used the 1939 aerial photograph to show the group the previous condition of the site (i.e. "modern historic conditions"), which was mostly salt pond rather than salt marsh. Next, we looked at a base plan overlain on a recent aerial photograph to look at some of the constraints on project design (e.g. the utility lines, road crossings of the former pond at the upstream end, the golf courses on two sides, and Founders Brook). Mr. Driscoll of the town of Portsmouth, indicated that Founders Brook is important for drainage of the upstream areas. Mr. Allin of the RI Division of Fish and Wildlife indicated that there is a package sewage treatment system for a hotel upstream of the project site. We discussed how the restoration project would affect freshwater (especially Founders Brook).

I indicated that the previous condition of the site as salt marsh meant that there would be different types of restoration alternatives (salt marsh to salt pond) and that alternatives that require more excavation will be more expensive and have a greater disposal problem. Mr. Larsen provided the estimated excavation quantities associated with all of the disposal options. I indicated that we would discuss technical factors and disposal alternatives in detail at the technical meeting that Mr. Larsen is setting up. I indicated that for any of the alternatives the existing tidal inlet between the railroad crossing and Mount Hope bay would have to be deepened. The inlet is good quality habitat. Mr. Allin asked if we considered reconfiguring the channel to make it straighter and reduce impacts to the existing inlet habitat. I indicated that we had talked about it, but could look at in greater detail.

Next, I described the salt marsh restoration alternative. I indicated that all the alternatives are preliminary and minor adjustments can be made. The salt marsh restoration alternative requires the least excavation and would restore a combination of high marsh, low marsh, and salt marsh channels. Based on our analysis, high marsh would be established between elevations 0.88 m to 0.83 m NGVD. Low marsh would be established between 0.83 m to 0.14 m NGVD.

Next, we discussed the pond restoration alternatives. I explained that we developed two pond alternatives: shallower and deeper options which will have different habitat benefits, excavation quantities and costs. I indicated that a weir would most likely be incorporated into these projects to allow management of water levels. Mr. Holmes asked if we had information about former anadromous fish use. I said I would look into it.

I indicated that we would also look at an alternative with about 50% salt marsh and 50% mudflat/pond habitat. This alternative will have intermediate costs and excavation quantities and may produce maximum diversity of bird use.

I asked the group to consider the alternatives for the project for discussion at the technical group meeting. I also indicated that we would be preparing an incremental analysis probably using Habitat Evaluation Procedures (HEP) to develop benefits since several different habitat types would be considered. I asked the group to consider the types of wildlife they would like to see at the site to help with that analysis. I said I would propose some species at the technical group meeting.
Mr. Tefft asked if we had considered on-site disposal of all the excavated material as we did for the Galilee Salt Marsh Restoration Project. He indicated that the upland habitat created at Galilee appears to have good wildlife value. I indicated we would consider on-site disposal among the options.

After the briefing, we viewed the marsh and the inlet through the railroad embankment.

5. **IMPORTANCE**: This meeting allowed us to brief agencies and other interested parties about the project and allowed agencies to view the site. It also allowed us to discuss some of the project alternatives and constraints.

Larry Oliver

LARRY OLIVER
Biologist
Environmental Resources Section
New England District

CF:
Mr. Oliver
Mr. Larsen
Mr. Hubbard
Eng/Plng Div Files
(c:mfrcrdb.wpd)

BOYD'S MARSH SITE VISIT 10/20/98

LARRY OLIVER	COE - ENVIRONMENTAL SECTION	978-318-8347
Kevin Nelson	RI Statewide Planning Program	401-222-2093
THURSTON L. GRAY	PORTS 22 MAILCOACH RD PORTSMOUTH RI 02871 RESIDENT	401-847-8676
Gregory W Manuesto	USFWS	401 3649124
MJ James-Pirri	NOAA Restoration Center + RI DEM Mosq. Abatement	401-222-615
TOM ARDITO	NARRAG. BAY ESTUARY PROG., DEM	401-222-3961
Daniel Markowski	R.I.D.E.M. Mosquito Abatement	401-222-6151
Al Gettman	RIDEM Mosquito Abatement	401-222-6151
Melvin Peter Holmes	US EPA. - Wetlands.	617565-3605.
Ann Kasella-Sullivan	AILT (Aquidneck Island	401 683 4549
Bob Anscoll	TOWN of PORTSMOUTH Land Trust)	683-3255
Brian C. Tefft	RIDEM-Fish+Wildlife	789-0281
David Larsen	Corps of Engineers - New England	978-318-8113
Charles C. Allin	R.I. Div. Fish & Wildlife	789-0281

Oliver

Oliver/ja/78347

September 15, 1998

Engineering/Planning Division
Evaluation Branch

FIELD(1)

Dear FIELD(2):

The purpose of this letter is to inform you of an upcoming site visit and begin coordination for a U.S. Army Corps of Engineers Feasibility Study of restoration of estuarine habitat at Boyds Marsh in Portsmouth, Rhode Island. Our partner in this effort is the Rhode Island Department of Environmental Management.

Disposal of dredged material at the site resulted in filling of the former estuarine habitats and nearly 100 percent coverage of common reed (*Phragmites australis*). The study will consider restoration of estuarine habitats (e.g. salt marsh and/or salt pond). A site map is enclosed.

A site visit for environmental agencies is scheduled for Thursday, October 20, 1998, at 1:00 p.m. We will begin the meeting at the end of Bayview Avenue as shown of the location map. My staff will provide a brief overview of the project at the meeting. This will provide your organization with an opportunity to comment on the project and exchange information.

Please contact Mr. Larry Oliver of my staff at (978) 318-8347, if you will be sending a representative to the site visit, or if you have any questions about the project.

Sincerely,

Anthony T. Mackos, P.E.
Chief, Engineering/Planning Division

Enclosures
CF: Oliver, Larsen, Read File, Eng/Plng Div file ***(c:bydcordv.frm)***

SAME LETTER SENT TO:

Mr. Michael Bartlett
U.S. Fish and Wildlife Service
New England Field Offices
22 Bridge Street, Unit #1
Concord, New Hampshire 03301-4986

Mr. Robert Mendoza
Environmental Protection Agency
Rhode Island State Office
J.F.K. Federal Building
Boston, Massachusetts 02203-2211

Mr. Christopher Mantzaris
National Marine Fisheries Service
One Blackburn Drive
Gloucester, Massachusetts 01930

Ms. Alicia M. Good, Director
Department of Environmental Management
Division of Water Resources
235 Promenade Street
Providence, Rhode Island 02903

Mr. John Stolgitis, Chief
Department of Environmental Management
Division of Fish and Wildlife
Oliver H. Stedman Government Center
4808 Tower Hill Road
Wakefield, Rhode Island 02879

Ms. Carolyn Weymouth
Department of Environmental Management
Office of Environmental Coordination
235 Promenade Street
Providence, Rhode Island 02903

Mr. Rick Enser
Rhode Island Natural Heritage Program
Department of Environmental Management
235 Promenade Street
Providence, Rhode Island 02903

Mr. Kevin Nelson
Department of Administration
Office of Strategic Planning
One Capitol Hill
Providence, Rhode Island 02908

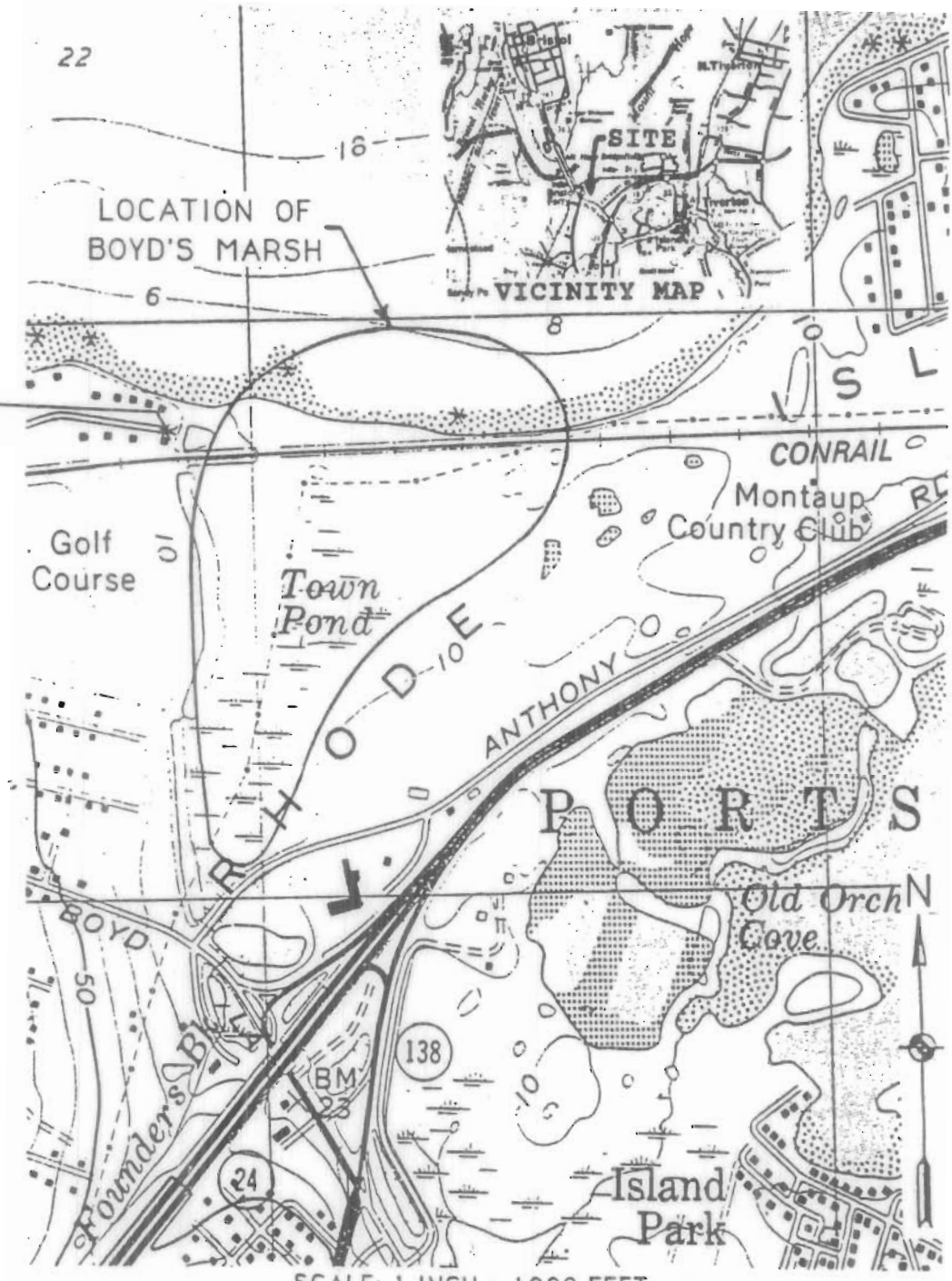
Mr. Peter Colosi
National Marine Fisheries Service
One Blackburn Drive
Gloucester, Massachusetts 01930

Ms. Mary Philcox
Eastern Rhode Island Soil Conservation District
747 Aquidneck Avenue
Room 206A
Middletown, RI 02840

Mr. Grover Fugate, Executive Director
RI Coastal Resources Management Council
Oliver H. Stedman Government Center
Tower Hill Road
Wakefield, RI 02879

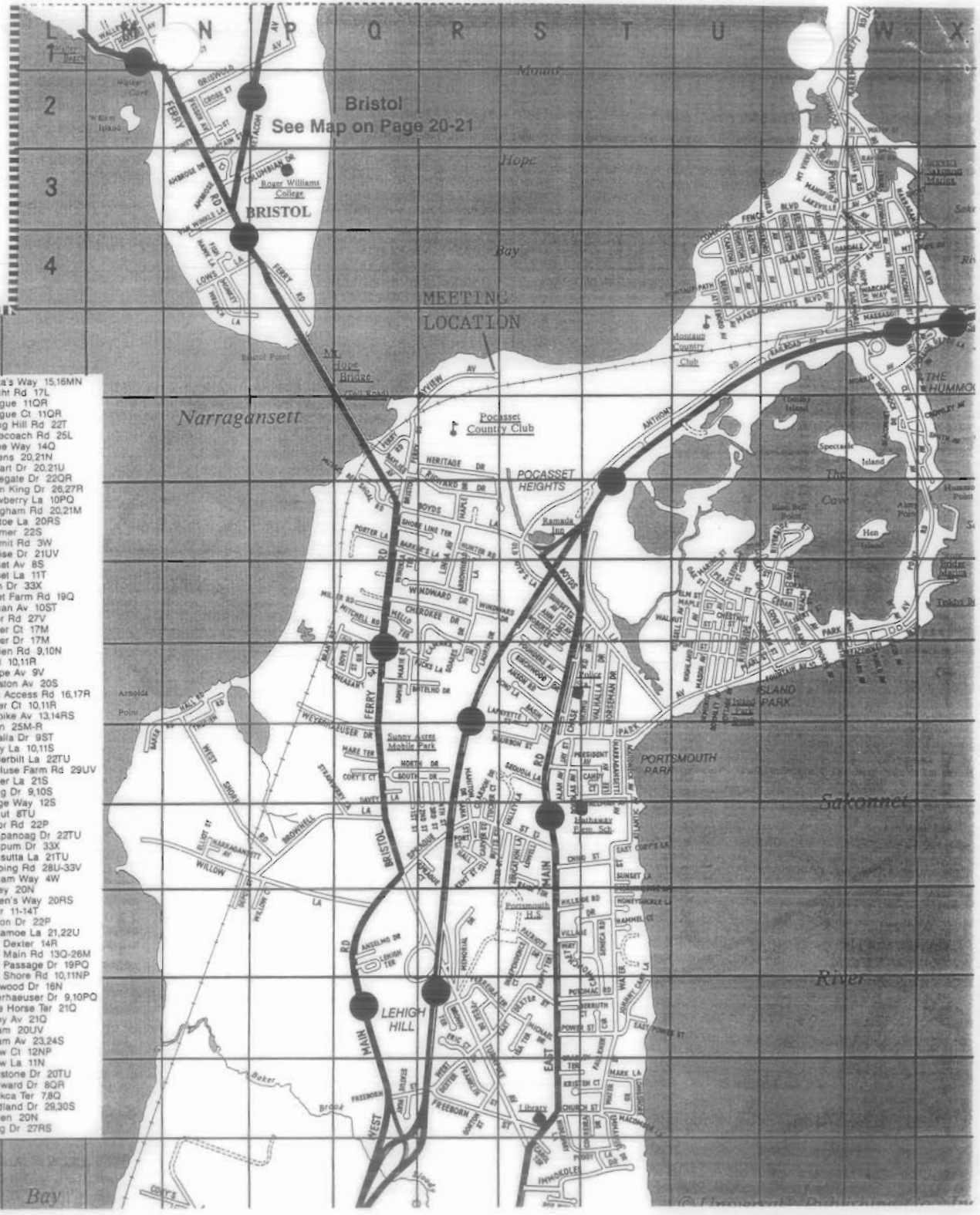
Copy Furnished:

Mr. Ronald Gagnon
Rhode Island Department of Environmental Management
235 Promenade Street
Providence, Rhode Island 02903



DEPARTMENT OF THE ARMY NEW ENGLAND DIVISION CORPS OF ENGINEERS WALTHAM, MA	SECTION 1135 PORTSMOUTH, RI **BOYD'S MARSH RESTORATION** LOCATION MAP	1/3

Century 21®
1-800-521-3336
Lawrence Associates
72 East Main Road, Middleton, RI 02840
Rentals • Sales • Property Management (401) 849-0660
Each office Independently Owned and Operated



PORTSMOUTH

Acorn Dr 25R
Adams Dr 26,27V
Alan Av 10S
Albert 21V
Alden Way 19L
Alexander Rd 18L
Almeida Ter 24L
Almy Knoll Ter 26M
Amando Dr 16MN
Ann Av 8S
Anne Hutchinson Ct 19TU
Annette Dr 20,21V
Anselmo Dr 12Q
Anson Rd 9S
Anthony Rd 6T
Apollo Rd 32,33Y
April La 16T
Aquidneck Av 10T
Arrowhead La 8R
Ash 19S
Athena Ter 19,20U
Atlantic Av 10,11T
Attleboro Av 4,5U
August la 22,23T
Avenue B 20MN
Baker Rd 10M
Baldwin Dr 19,20R
Bancroft Dr 25N
Barker's La 7QR
Basin 9S
Bay 8UV
Bayberry Rd 31X
Baylies Av 6Q
Bayside Av 18TU
Bayview Av 5,6QR, 17P
Beach 8V
Beany Rd 17L
Beaupre Rd 23S
Belmont Dr 27S
Benedict Av 23T
Benjamin Dr 24RS
Berkeley Av 4U
Bernstein Cir 25M
Berruth Ct 13ST
Birch 19RS
Birchwood Dr 9S
Black Point La 31,32V-X
Bleau La 30ST
Botelho Dr 9QR
Bourbon 10RS
Boyds La 7Q-8T
Bradford Av 19MN
Bradley Ter 13,14S
Braman La 30ST
Brandzen La 23S
Brant Rd 8,9P
Briarwood La 32,33V
Brickhead Way 27,28UV
Bristol Ferry Rd 6-11Q
Brown Ter 13R
Brownell La 11P
Buckwheat Av 21P
Burma Rd 22L
Butts 11R
Caiger La 18S
Camara Dr 8,9QR
Candy Ct 10ST
Canonchet Dr 12,13ST
Canton Av 4U
Capillary Way 16Q
Carol Ter 15S
Carriage Dr 25R
Carter Dr 31UV
Carver 11R
Gen Sullivan Cir 25,26V
Gibbs La 26RS
Gideon Lawton La 16,17ST
Gilbert C. Barker Dr 24,25U
Gilda La 22S
Glen Farm Rd 24,25U
Glen Mead Dr 27,28S
Glen Rd 24T-V
Glen Ter 23,24TU
Gormley Av 9,10U
Gorton 14R
Gould Av 9W
Gourlarte La 30QR
Graine Ter 21,22P
Green 8V
Greenfield Av 3,4UV
Greenvale Rd 30UV
Hall 11R
Hall Rd 9N
Hammel Ct 12T
Harbor View Rd 25,26KL
Hargraves Dr 16S
Harrington Av 23T
Harris Av 23T
Harvest Dr 30S
Hathaway Dr 20R
Hedley 17Q
Heidi Dr 24V
Henry Danis Ct 16R
Heritage Dr 6R
Hicks La 9QR
Hideaway La 14,15S
Highland Av 8,9U
High Point Av 16Q
Hillcrest Rd 20Q
Hillside Av 5W
Hillside Rd 12ST
Hilltop Dr 19,20Q
Holliston Av 3,4V
Holman 17,18S
Homestead La 15,16T
Honeysuckle La 12T
Hope Av 4W
Hummock Av 5,6W
Hummock Point Rd 2-5V
Hunter Rd 7R
Immokolee Dr 15ST
Independence Ct 12,13RS
Indian Av 33,34XY
Island 8,9V
Island Park Av 8,9W
Island Rd 3VW
Islington Av 3,4V
Ivy Av 8W
Jacqueline Ter 23,24S
James Ct 34,35W
Jay 10S
Jepson La 27MN
Jesse Dr 13R
Jo Anne Av 24S
John 21N
Johnny Cake La 12,13T
Joshua La 22R
Judson Av 4V
Julia Ct 20U
Kaitlyn Pl 24R
Karen 20UV
Kathy Cir 21N
Kenneth Av 23,24S
Kensington Av 3,4V
Kent 11R
Kerr Rd 21U
King Charles Dr 16,17MN
King Phillip 4W
Kirduglyn Rd 18,19T
Kristen Ct 14ST
Kubla Ct 29,30S
Mt View Ter 2,3V
Mussel Bed Shoal Rd 6,7PQ
Narragansett Av 11N, 10,11T
Narragansett Blvd 3,4W
Narragansett Rd 1,2VW
Nina Rd 18S
Norseman Dr 9,10T
North 16Q
North Access Rd
North Dr 10QR
North Water 2W
Norwood Av 3,4VX
Oak 8U
Oakdale Av 4VW
Oakland Farm Rd 26RS
Old Boyd's La 7,8S
Old Mill La 33,34VW
Oliver Hazard Perry Rd 19U
Ormerod Av 9U
Orchard View Rd 19R
Palmer Pk 22S
Paquin La 28R
Paquin Pk 34XY
Park Av 8W-10T
Patriots Dr 12S
Peace 8U
Pear 20Q
Pearl 9UV
Peggy La 15ST
Peleg Rd 19T
Pequot 34W
Perrault 27M
Petomanowet La 22U
Petticoat La 17QR
Pheasant Dr 9PQ
Pilgrim La 31S
Pine 8,9U
Pine Tree Rd 19S
Pioneer La 26L
Pleasant 16,17Q
Pleasant View Av 21T
Point 7UV
Point Rd 7,8W
Porter La 7Q
Portsmouth 4V
Potomac Rd 13ST
Power 13ST
President Av 10ST
Prince Heart Dr 33,34X
Prospect Ct 17T
Prospect La 17S
Prudence View Rd 20Q
Quail Rd 8,9Q
Quaker La 16R
Quincy Av 4W
Railroad Av 5V
Rainbow Hgts 19NP
Randall La 30RS
Raposa Sq 33,34X
Ravine Rd 3W
Raymond Dr 21TU
Raynham Av 3,4W
Redwood Rd 25K
Reise Ter 11,12S
Rhode Island Blvd 4U-V
Richard Dr 6,7R
Riverside 7V-9U
Riverside Av 5WX
Roberts Av 8S
Robin Rd 20U
Roger Williams Ct 19T
Rolling Hill Dr 24L
Russell Av 8,9TU
Russet Rd 21Q
Ruth Av 9VW
Sagamore 4,5W
Sakonnet Dr 3W
Souza's Way 15,16MN
Specht Rd 17L
Sprague 11QR
Sprague Ct 11QR
Spring Hill Rd 22T
Stagecoach Rd 25L
Statue Way 14Q
Stevens 20,21N
Stewart Dr 20,21U
Stonegate Dr 22QR
Storm King Dr 26,27R
Strawberry La 10PQ
Stringham Rd 20,21M
Stubtoe La 20RS
Summer 22S
Summit Rd 3W
Sunrise Dr 21UV
Sunset Av 8S
Sunset La 11T
Swan Dr 33X
Sweet Farm Rd 19Q
Tallman Av 10ST
Taylor Rd 27V
Thayer Ct 17M
Thayer Dr 17M
Therien Rd 9,10N
Third 10,11R
Thorpe Av 9V
Thurston Av 20S
Town Access Rd 16,17R
Tucker Ct 10,11R
Turnpike Av 13,14RS
Union 25M-R
Valhalla Dr 9ST
Valley La 10,11S
Vanderbilt La 22TU
Vaucluse Farm Rd 29UV
Vesper La 21S
Viking Dr 9,10S
Village Way 12S
Walnut 8TU
Walter Rd 22P
Wampanoag Dr 22TU
Wampum Dr 33X
Wamsutta La 21TU
Wapping Rd 28U-33V
Warcam Way 4W
Warley 20N
Warren's Way 20RS
Water 11-14T
Watson Dr 22P
Weetamoe La 21,22U
West Dexter 14R
West Main Rd 13Q-26M
West Passage Dr 19PQ
West Shore Rd 10,11NP
Westwood Dr 16N
Weyerhaeuser Dr 9,10PQ
White Horse Ter 21Q
Wilkey Av 21Q
William 20UV
William Av 23,24S
Willow Ct 12NP
Willow La 11N
Windstone Dr 20TU
Windward Dr 8QR
Winekca Ter 7,8Q
Woodland Dr 29,30S
Worden 20N
Young Dr 27RS

APPENDIX EA-B
BENTHIC INVERTEBRATE SAMPLING RESULTS

Benthic invertebrates from Boyds Marsh, Portsmouth RI .

Sheldon D. Pratt
13 Sherman Court
Wakefield, R.I. 02879

October 30, 1998

Backgound

The New England Division, USACOE obtained duplicate core samples at six stations within the Boyds Marsh Restoration Project area. The marsh is in the former Town Cove which enters Mount Hope Bay east of the Mount Hope Bridge. The samples were sieved to 0.5 mm and transported to the University of Rhode Island by Corps personnel for identification and enumeration of organisms.

Methods

On there arrival at URI the samples were preserved in 10% formaldehyde with 0.1% rose bengal stain. Samples were kept in formaldehyde solution until they were processed. At this time the samples were washed on a 0.5 mm sieve to remove preservative and remaining fine sediment and then divided into different size and density fractions by sieving and decantation.. Material retained on a 2 mm. screen was sorted without magnification from glass trays. Fine low density material (including organic detritus and most organisms) and fine heavy material (including sand and mollusks) were examined under low-power dissecting microscopes. Notes were made on sediment residues which remained after sorting was completed.

Organisms were identified to species in most cases. Counts of organisms and descriptions of sample residues were entered on a MS Excel spread sheet (Table 1). Identified organisms were preserved in 70% alcohol and archived at the University of Rhode Island Graduate School of Oceanography.

Results and Discussion

The sieve residues from station 1-3 contained 200-400cc of gravel and sand containing many *Crepidula* shells and smaller numbers of oyster and Littorina shells. Small fronds of red algae was attached to hard surfaces. Station 4 samples were similar, but with less coarse material.. Samples from station 5 and 6 contained 40-200 cc of intact and decomposed *Phragmites australis* and a small amount of sediment.

While there was a relatively high level of variability in community parameters at the study area both within and between stations, the following general patterns were seen. At all stations, species diversity was low relative to unconfined Mount Hope Bay habitats. Within the study area diversity was highest at stations near the inlet (max. 12 species) and declined to 1-3 species in the three innermost stations. The most diverse

taxa were annelid worms and amphipod crustaceans. Mollusks were not important members of the benthic community at this location.

Oligochaetes were the most numerous taxa sampled, with high densities at stations 3 and 4. Oligochaetes are subsurface deposit feeders. Three species of omnivorus epifaunal amphipods were recovered in samples from stations 2 and 3.

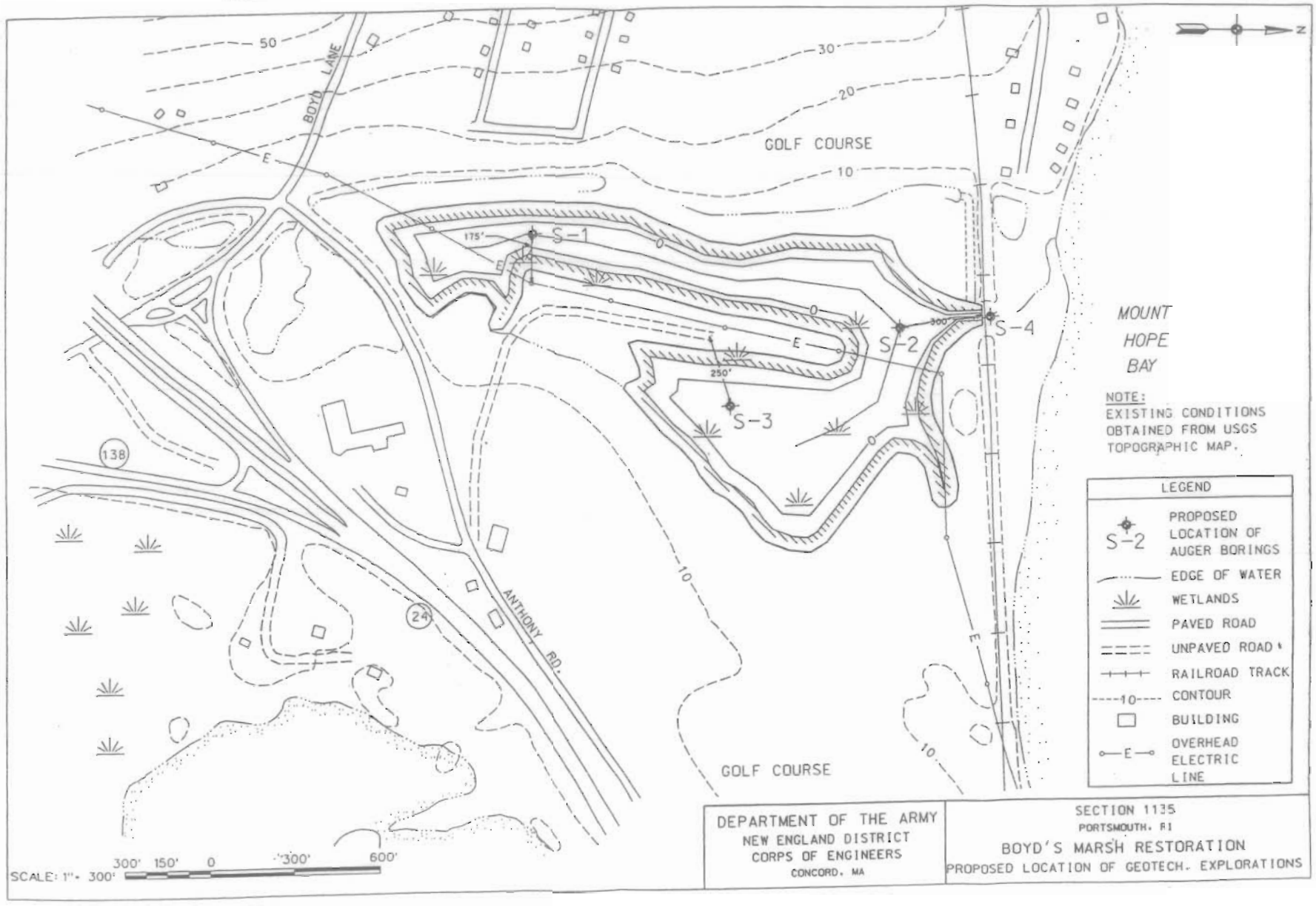
Station 1 differed from other stations in the presence of several species common in Narragansett Bay and the low numbers of oligochaetes and amphipods present. Station 2 and 3 had a high number of individuals and shared many species. No organisms were found in sample 4A. The three species found in sample 4B are found in outer stations at higher density. Stations 5 and 6 had only eight organisms present; half of these were chironomid insect larvae.

Acknowledgment Sample sorting was carried out by Kelly Gomez

Figure 1. Boyds Marsh Restoration Project: Benthic invertebrates recovered from cores obtained 10 / 98.
(seive size, 0.5mm)

STATION	1		2		3		4		5		6	
SAMPLE	A	B	A	B	A	B	A	B	A	B	A	B
NEMATODA			9	3								1
NEMERTEA	3		12					1				
MOLLUSCA												
Crepidula fornicata	1	1	2									
Boonea seminuda	1											
ANNELIDA												
POLYCHAETA												
Capitella capitata	2	6	1									
Hypereteone heteropoda	1											
Lietoscoloplos sp.	4	4		1								
Lycastopsis pontica				1		1						
Micropthalmus sp.	2	1										
Neanthes virens	1											
Polydora cornuta	1	4	4	3	1			1				
Streblospio benidicti		1										
Polygordius appendiculatus		43										
OLIGOCHAETA												
Oligochaeta spp.		4	47	304	321	430		36	1	1		
Peloscolex benideni		4		1								
ARTHROPODA												
INSECTA												
chironomide	1		2		5				1	3	1	
CRUSTACEA												
AMPHIPODA												
Corophium sp.	1											
Gammarus tigrinus			23	9	216	30						
Mucrogammarus mucronatus			7	13	3							
Melita nitida	1		6	6	2							
DECAPODA												
Pagurus longicarpa		3										
NUMBER OF SPECIES	12	10	10	9	6	3	0	3	2	2	1	1
NUMBER OF INDIVIDUALS	19	71	113	341	548	461	0	38	2	4	1	1

APPENDIX EA-C
SEDIMENT CHEMISTRY TESTING RESULTS


BOYD LANE
ANTHONY RD.
GOLF COURSE
GOLF COURSE
MOUNT HOPE BAY
S-1
S-2
S-3
S-4
175'
250'
300'
138
24
50
30
20
10
0
E
NOTE:
EXISTING CONDITIONS OBTAINED FROM USGS TOPOGRAPHIC MAP.
LEGEND
PROPOSED LOCATION OF AUGER BORINGS
EDGE OF WATER
WETLANDS
PAVED ROAD
UNPAVED ROAD
RAILROAD TRACK
CONTOUR
BUILDING
OVERHEAD ELECTRIC LINE
SCALE: 1" = 300'
300' 150' 0 300' 600'
DEPARTMENT OF THE ARMY
NEW ENGLAND DISTRICT
CORPS OF ENGINEERS
CONCORD, MA
SECTION 1135
PORTSMOUTH, RI
BOYD'S MARSH RESTORATION
PROPOSED LOCATION OF GEOTECH. EXPLORATIONS

Boyd's Marsh Sediment Chemistry Testing Results

	UNITS	Regulatory Standard	S-1	S-2	S-2 DUP	S-3	S-4	S-4 DUP	S-1,2,3
PCBs, method 8082									
Aroclor-1016	ug/Kg		32 U	30 U	32 U	27 U	35 U		
Aroclor-1221	ug/Kg		32 U	30 U	32 U	27 U	35 U		
Aroclor-1232	ug/Kg		32 U	30 U	32 U	27 U	35 U		
Aroclor-1242	ug/Kg		32 U	30 U	32 U	27 U	35 U		
Aroclor-1248	ug/Kg		32 U	30 U	32 U	27 U	35 U		
Aroclor-1254	ug/Kg		32 U	30 U	32 U	27 U	35 U		
Aroclor-1260	ug/Kg		32 U	30 U	32 U	27 U	35 U		
Total Petroleum Hydrocarbons, Diesel Range Organics (DRO), method 8015									
Diesel Fuel	mg/Kg		26	12 U	23	12	32		
Motor Oil	mg/Kg		360	72	340	180	450		
Total Petroleum Hydrocarbons, Gasoline Range Organics (GRO), method 8015									
Gasoline	mg/Kg		0.98 U	8.1	0.96 U	0.81 U	1.1 U		
Total metals, method 6010 and 7000 series									
Arsenic	mg/kg	10*	8.5	8.4	8.6	6.6	6.8		
Cadmium	mg/kg	5*	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U		
Chromium	mg/kg	100*	40.3	34.7	34.1	27.2	32.2		
Copper	mg/kg	200*	16.0	14.1	15.4	10.5	22.4		
Lead	mg/kg	25*	21.2	17.6	22.3	13.1	31.2		
Mercury	mg/kg	0.5*	0.19	0.14	0.11	0.10	0.27		
Nickel	mg/kg	50*	18.9	18.8	17.3	13.3	20.2		
Vanadium	mg/kg	75*	39.6	36.1	35.4	28.0	35.2		
Zinc	mg/kg	200*	73.9	75.8	76.0	47.6	101		
Cyanide, method 9010A									
Cyanide	mg/kg		1.0 U	1.1 U	1.0 U	0.95 U	1.2 U		
TCLP Volatile Organics, method 1311/8260									
Vinyl Chloride	ug/L	200**	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U		
1,1-Dichloroethene	ug/L	700**	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U		
2-Butanone	ug/L	200000**	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U		
Chloroform	ug/L	6000**	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U		
Carbon Tetrachloride	ug/L	500**	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U		
Benzene	ug/L	500**	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U		
1,2-Dichloroethane	ug/L	500**	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U		
Trichloroethene	ug/L	500**	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U		

	UNITS	Regulatory Standard	S-1	S-2	S-2 DUP	S-3	S-4	S-4 DUP	S-1,2,3
Tetrachloroethene	ug/L	700**	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U		
Chlorobenzene	ug/L	100000**	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U		
TCLP Pesticides, method 1311/8081									
gamma-BHC (Lindane)	mg/L	400**	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U		
Heptachlor	mg/L	8**	0.0030 U	0.0030 U	0.0030 U	0.0030 U	0.0030 U		
Heptachlor epoxide	mg/L	8**	0.0030 U	0.0030 U	0.0030 U	0.0030 U	0.0030 U		
Endrin	mg/L	20**	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U		
Methoxychlor	mg/L	10000**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
Technical Chlordane	mg/L	30**	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U		
Toxaphene	mg/L	500**	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U		
TCLP Herbicides, method 1311/8150									
2,4-D	mg/L	10000**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
2,4,5-TP (Silvex)	mg/L	1000**	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U		
TCLP Semivolatile Organics, method 1311/8270									
Pyridine	ug/L	5000**	50 U	50 U	50 U	50 U	50 U		
1,4-Dichlorobenzene	ug/L	7500**	50 U	50 U	50 U	50 U	50 U		
2-Methylphenol	ug/L	200000**	50 U	50 U	50 U	50 U	50 U		
4-Methylphenol	ug/L	200000**	50 U	50 U	50 U	50 U	50 U		
Hexachloroethane	ug/L	3000**	50 U	50 U	50 U	50 U	50 U		
Nitrobenzene	ug/L	2000**	50 U	50 U	50 U	50 U	50 U		
Hexachlorobutadiene	ug/L	500**	50 U	50 U	50 U	50 U	50 U		
2,4,6-Trichlorophenol	ug/L	2000**	50 U	50 U	50 U	50 U	50 U		
2,4,5-Trichlorophenol	ug/L	400000**	120 U	120 U	120 U	120 U	120 U		
2,4-Dinitrotoluene	ug/L	130**	50 U	50 U	50 U	50 U	50 U		
Hexachlorobenzene	ug/L	130**	50 U	50 U	50 U	50 U	50 U		
Pentachlorophenol	ug/L	100000**	120 U	120 U	120 U	120 U	120 U		
TCLP Metals, method 6010 and 7000 series									
Arsenic	ug/L	5000**	7.7	1.8 U	1.8 U	1.8 U	8.2		
Barium	ug/L	100000**	14.6	15.5	11.2	10.2	8.4		
Cadmium	ug/L	1000**	1.2	1.3	1.7	0.49	0.83		
Chromium	ug/L	5000**	3.9	2.1	0.98	0.7 U	0.81		
Lead	ug/L	5000**	11.1	4.7	5.2	8.1	16.7		
Mercury	ug/L	200**	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U		
Selenium	ug/L	1000**	4.8	5.6	4.4	5.5	3.0		
Silver	ug/L	5000**	3.4	0.90 U	0.90 U	0.90 U	0.90 U		

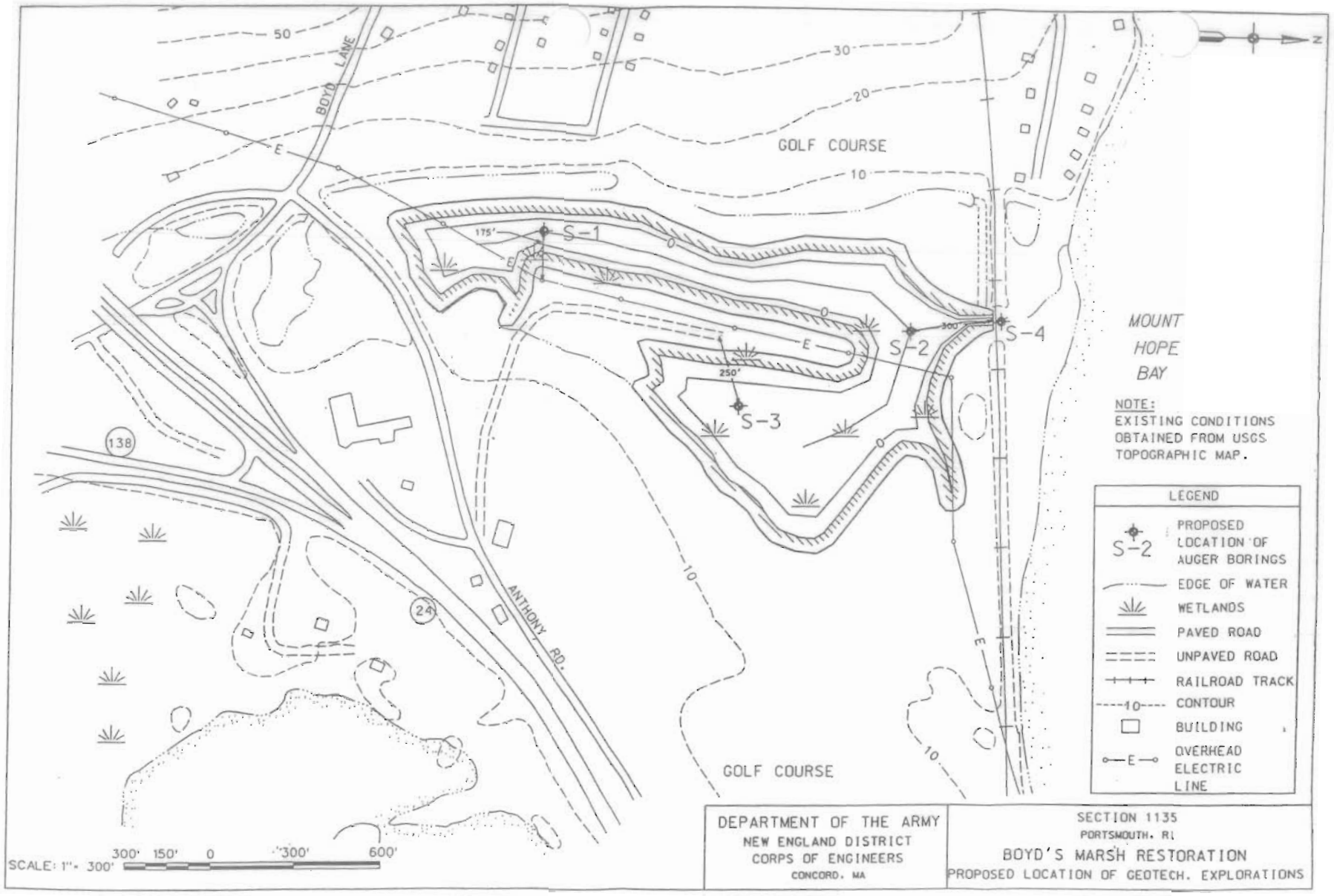
	UNITS	Regulatory Standard	S-1	S-2	S-2 DUP	S-3	S-4	S-4 DUP	S-1,2,3
Percent Solids, method 2540B (Standard Methods)									
Percent Solids	% w/w	60*	51.4	54.6	52.0	61.9	47.4	48.7	52.5
Total Organic Carbon, Lloyd Kahn method									
Total Organic Carbon	mg/kg						10700	9800	8940
Total Volatile Solids, method 160.4									
Total Volatile Soids	mg/kg	50000*	33300	27900	28200	24900	24200		
Moisture Content, ASTM method D2216									
Moisture Content	%						120.8	99.7	76.8
Pesticides, method 8081A									
alpha-BHC	ug/Kg						3.6 U	3.5 U	3.2 U
beta-BHC	ug/Kg						3.6 U	3.5 U	5.4
delta-BHC	ug/Kg						3.6 U	3.5 U	3.2 U
gamma-BHC (Lindane)	ug/Kg						3.6 U	3.5 U	3.2 U
Heptachlor	ug/Kg						3.6 U	3.5 U	3.2 U
Aldrin	ug/Kg						3.6 U	3.5 U	3.2 U
Heptachlor epoxide	ug/Kg						3.6 U	3.5 U	3.2 U
Endosulfan I	ug/Kg						3.6 U	3.5 U	3.2 U
Dieldrin	ug/Kg						7.2 U	6.9 U	6.5 U
4,4'-DDE	ug/Kg						7.2 U	6.9 U	6.5 U
Endrin	ug/Kg						7.2 U	6.9 U	6.5 U
Endosulfan II	ug/Kg						7.2 U	6.9 U	6.5 U
4,4'-DDD	ug/Kg						7.2 U	6.9 U	6.5 U
Endosulfan sulfate	ug/Kg						7.2 U	6.9 U	6.5 U
4,4'-DDT	ug/Kg						7.2 U	6.9 U	6.5 U
Methoxychlor	ug/Kg						36 U	35 U	32 U
Endrin ketone	ug/Kg						7.2 U	6.9 U	6.5 U
Endrin aldehyde	ug/Kg						7.2 U	6.9 U	6.5 U
Chlordane	ug/Kg						36 U	35 U	32 U
Toxaphene	ug/Kg						360 U	350 U	320 U
PAHs, method 8270									
Naphthalene	ug/Kg						700 U	690 U	630 U
2-Methylnaphthalene	ug/Kg						700 U	690 U	630 U
Acenaphthylene	ug/Kg						700 U	690 U	630 U
Acenaphthene	ug/Kg						700 U	690 U	630 U
Fluorene	ug/Kg						700 U	690 U	630 U

	UNITS	Regulatory Standard	S-1	S-2	S-2 DUP	S-3	S-4	S-4 DUP	S-1,2,3
Phenanthrene	ug/Kg						700 U	690 U	630 U
Anthracene	ug/Kg						700 U	690 U	630 U
Fluoranthene	ug/Kg						700 U	39 J	630 U
Pyrene	ug/Kg						34 J	40 J	630 U
Benzo(a)anthracene	ug/Kg						700 U	690 U	630 U
Chrysene	ug/Kg						700 U	690 U	630 U
Benzo(b)fluoranthene	ug/Kg						700 U	690 U	630 U
Benzo(k)fluoranthene	ug/Kg						700 U	690 U	630 U
Benzo(a)pyrene	ug/Kg						700 U	690 U	630 U
Indeno(1,2,3-cd)pyrene	ug/Kg						700 U	690 U	630 U
Dibenz(a,h)anthracene	ug/Kg						700 U	690 U	630 U
Benzo(g,h,i)perylene	ug/Kg						700 U	690 U	630 U
PCB congeners - NOAA Status and Trends method									
PCB-8 (2,4')	ug/Kg						1.6 U	1.5 U	1.4 U
PCB-18 (2,2',5)	ug/Kg						0.36 U	0.34 U	0.33 U
PCB-28 (2,4,4')	ug/Kg						0.21 U	0.20 U	0.19 U
PCB-44 (2,2',3,5')	ug/Kg						0.21 U	0.20 U	0.19 U
PCB-52 (2,2',5,5')	ug/Kg						0.21 U	0.20 U	0.19 U
PCB-66 (2,3',4,4')	ug/Kg						0.21 U	0.20 U	0.19 U
PCB-77 (3,3',4,4')	ug/Kg						0.21 U	0.20 U	0.19 U
PCB-101 (2,2',3,5,5')	ug/Kg						0.21 U	0.20 U	0.19 U
PCB-105 (2,3,3',4,4')	ug/Kg						0.21 U	0.20 U	0.19 U
PCB-114 (2,3,4,4',5)	ug/Kg						0.21 U	0.20 U	0.19 U
PCB-118 (2,3',4,4',5)	ug/Kg						0.21 U	0.20 U	0.19 U
PCB-123 (2',3,4,4',5)	ug/Kg						0.21 U	0.20 U	0.19 U
PCB-126 (3,3',4,4',5)	ug/Kg						0.21 U	0.20 U	0.19 U
PCB-128 (2,2',3,3',4,4')	ug/Kg						0.21 U	0.20 U	0.19 U
PCB-138 (2,2',3,4,4',5')	ug/Kg						0.21 U	0.20 U	0.19 U
PCB-153 (2,2',4,4',5,5')	ug/Kg						0.21 U	0.20 U	0.19 U
PCB-156 (2,3,3',4,4',5)	ug/Kg						0.21 U	0.20 U	0.23
PCB-157 (2,3,3',4,4',5')	ug/Kg						0.21 U	0.20 U	0.19 U
PCB-167 (2,3',4,4',5,5')	ug/Kg						0.21 U	0.20 U	0.19 U
PCB-169 (3,3',4,4',5,5')	ug/Kg						0.21 U	0.20 U	0.19 U
PCB-170 (2,2',3,3',4,4',5)	ug/Kg						0.21 U	0.20 U	0.19 U
PCB-180 (2,2',3,4,4',5,5')	ug/Kg						0.21 U	0.20 U	0.19 U

	UNITS	Regulatory Standard	S-1	S-2	S-2 DUP	S-3	S-4	S-4 DUP	S-1,2,3
PCB-187 (2,2',3,4',5,5',6)	ug/Kg						0.21 U	0.20 U	0.19 U
PCB-189 (2,3,3',4,4',5,5')	ug/Kg						0.21 U	0.20 U	0.19 U
PCB-195 (2,2',3,3',4,4',5,6)	ug/Kg						0.21 U	0.20 U	0.19 U
PCB-206 (2,2',3,3',4,4',5,5',6)	ug/Kg						0.21 U	0.20 U	0.19 U
PCB-209 (2,2',3,3',4,4',5,5',6,6')	ug/Kg						0.21 U	0.20 U	0.19 U

U = Undetected at the stated reporting limit.
J = Estimated value, below the laboratory reporting limit.

* = RI Dredged Material Disposal Requirements - Class I
** = EPA SW-846, Test Methods for Evaluating Solid Waste, Third Edition, Update III, December 1996.


BOYD LANE
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APPENDIX EA-D
ECOLOGICAL DESIGN CRITERIA

Town Pond Restoration
Environmental Design Criteria
July 13, 2001

This report provides the preliminary environmental design criteria for the Town Pond Restoration Project. In addition to the No Action Alternative, four action alternatives with off-site disposal and two alternatives with on-site disposal are under consideration. Among the off-site disposal alternatives, one alternative maximizes the area of salt marsh restored, two alternatives maximize the area of salt pond restored at different depths, and one alternative provides a ratio of about fifty percent open water and fifty percent salt marsh/mudflat. Design criteria for each of the action alternatives are defined based on evaluation of vegetation and hydrology.

General Salt Marsh Elevational Zones

Salt marshes are divided into two zones: low marsh and high marsh. The vegetation in the low salt marsh consists almost exclusively of salt marsh cordgrass (*Spartina alterniflora*). The taller form of this species grows in the low marsh where frequent flooding and draining of the sediments creates favorable growth conditions. In general, the low salt marsh extends from a lower limit around the elevation of mean sea level (MSL), depending on a number of hydrologic factors, to about the elevation of mean high water (MHW)[1].

The high salt marsh is situated between about MHW and the level of the highest astronomic tides (Lefor et. al. 1987; Bertness and Ellison 1987) or mean spring high water (MSHW) (Niering and Warren 1980). MSHW is probably a good estimate of the upper limit of the marsh plain with higher astronomic tides and storm tides flooding the generally steeper sloped upper border of the marsh where high tide bush (*Iva frutescens*) and switchgrass (*Panicum virgatum*) occur.

In estuarine areas affected by tidal restriction, rduced soil water salinity, or filling with dredged material, common reed (*Phragmites australis*; hereafter referred to as Phragmites) often grows to elevations where it can out-compete salt marsh vegetation. There is apparently a transition zone in the range of 20 to 28 parts per thousand salinity, within which either salt marsh or Phragmites can occur and above which only salt marsh plants grow. Although the range inhabited by Phragmites will differ among sites based on salinity concentrations and the quantity and dynamics of freshwater inflow, predictions of the appropriate number of flooding tides to maintain salt marsh, rather than Phragmites, can be estimated based on previous evaluations. Based on analysis at the Galilee Salt Marsh in Narragansett, Rhode Island performed by the

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[1]Although there is some discussion about the accuracy of using MHW as the upper limit in the literature (Nixon 1982; Lefor et. al. 1987; McKee and Patrick 1988), within the tide range occurring at Town Pond, MHW is a reasonable estimate.

University of Rhode Island, Department of Natural Resources Science and evaluations conducted by the Corps for the Sagamore Marsh Restoration Project in Bourne and Sandwich, Massachusetts, a flooding frequency of eight times per month should be sufficient to maintain salt marsh, without Phragmites.

Elevations of Tidal Datums at the Project Site

The elevations of MSL, MHW, and MSHW in Mount Hope Bay (Bristol Point) in the vicinity of Town Pond are 0.2, 0.8, and 0.95 meters (m) NGVD (0.6, 2.6, and 3.1 feet NGVD or 2.1, 4.1, and 4.6 feet MLLW). (All following elevations are based on NGVD, unless otherwise noted.) The elevation flooded, on average, eight times per month is 1.0 m. The elevation of the highest astronomic tides is 1.4 m NGVD.

Measured Elevations of Salt Marsh Vegetation in the Vicinity of Town Pond

Measurements of the elevation of various vegetation zones on-site provide an indication of the likely range of vegetation in the restored marsh. Combined with predictions of tidal elevations with the project alternatives and known relationships of vegetation zones and tidal datums, the future characteristics of the restored system are predicted. The following elevational ranges of vegetation zones are based on surveyed samples of vegetation types at the site.

Measurements of the elevation of salt marsh cordgrass in the vicinity of Town Pond collected by the Corps of Engineers indicate that it ranges from -0.03 to 0.99 m. The observed range was greatest on the open beach face outside the marsh embayment (-0.03 to 0.99 m). Inside the tidal creeks where the tidal range is restricted, the elevational range of salt marsh cordgrass was compressed ranging from 0.14 to 0.85 m.

Sample measurements of the elevation of high marsh vegetation (including high tide bush, *Iva frutescens*) at Town Pond indicate that it ranges from 0.83 to 0.98 m, but overlaps with Phragmites at 0.92 meters.

Analysis and Predictions of Habitat Zones with the Action Alternatives

The study site is separated into three "compartments" for analysis (Figure 1). The three compartments are the exposed open shoreline of Mount Hope Bay, the existing channel from the Mount Hope Bay shoreline to the railroad bridge over the existing tidal inlet, and the interior marsh embayment that would be restored south of the railroad bridge. The relationships between tidal datums and vegetation zones in the three compartments of the study site are shown in Figure 2.

The first section of Figure 2 shows the elevational range of salt marsh cordgrass along the exposed shoreline. The patch of salt marsh cordgrass where the measurements were made extends from -0.03 m to 0.99 m which is below the elevation of MSL and above MSHW, indicating that it dominates the range generally considered to be high marsh, as well as the low marsh. The salt marsh cordgrass extends to about the elevation flooded 8 times per month.

In the second compartment, between the bay and the railroad bridge, the salt marsh cordgrass extends from 0.14 m to 0.85 m, above MHW and above the lowest measured elevation of high marsh. The high marsh vegetation extends from 0.83 m to 0.98 m, with a lower limit only 3 cm above MHW. The lowest measured elevation of Phragmites was 0.92 m, which overlaps a portion of the high marsh zone. The lowest measured elevation of Phragmites was also 5 cm above the elevation flooded 8 times per month (0.87 m). There was no difference in the elevation of MHW for any of the compartments, including the compartment above the railroad bridge. As is typical, the higher tide elevations are more affected by restrictions in flow area. In this somewhat tidally restricted area, the difference in elevation between MHW and MSHW is only 6 centimeters.

Based on the vegetation and tidal datum information in the previous paragraphs, the design elevations of various habitat zones inside the area to be restored are shown in Table 1. The low water elevation upstream of the railroad bridge will be 0.0 m; therefore, all areas graded below this elevation will be permanent open water, or salt pond. The elevational range of other habitat types must be adjusted for the reduction of tidal range that occurs upstream of the railroad bridge. The elevational range of vegetation is compressed when the tidal range is compressed moving upstream, but the less extreme tidal datums (e.g. MSL and MHW) are less affected than the more extreme tidal datums (e.g. MSHW), although the difference is still very minor. Therefore, habitat zones in the area to be restored that are closer to MSL and MHW should be similar to those north of the railroad bridge.

The predicted range of low marsh (salt marsh cordgrass marsh) in the restoration area is from 0.14 m to 0.83 m NGVD. This range is based on the lower limit of salt marsh cordgrass upstream (in the middle compartment) and the lower elevation of high marsh vegetation upstream.

The lower limit of high marsh should occur at about 0.83 m. The estimate of the upper limit of high marsh could be the predicted elevation flooded 8 times per month upstream of the railroad bridge (0.85 m), or the adjusted lowest observed elevation of Phragmites downstream of the railroad bridge (0.92 - 0.02 = 0.90 m). (The lower limit of Phragmites is adjusted (slightly) to account for the compression of tidal range upstream as reflected by the 0.02 m reduction in the height of MSHW.) Using the lower elevation (0.85 m) would ensure greater restoration of estuarine habitat, while using the higher elevation (0.90 m) would require slightly less grading. The difference is very small (5 cm) especially considering the capabilities of surveying and construction equipment, so an elevation half way between the two (0.88 m) is recommended for the upper limit of grading.

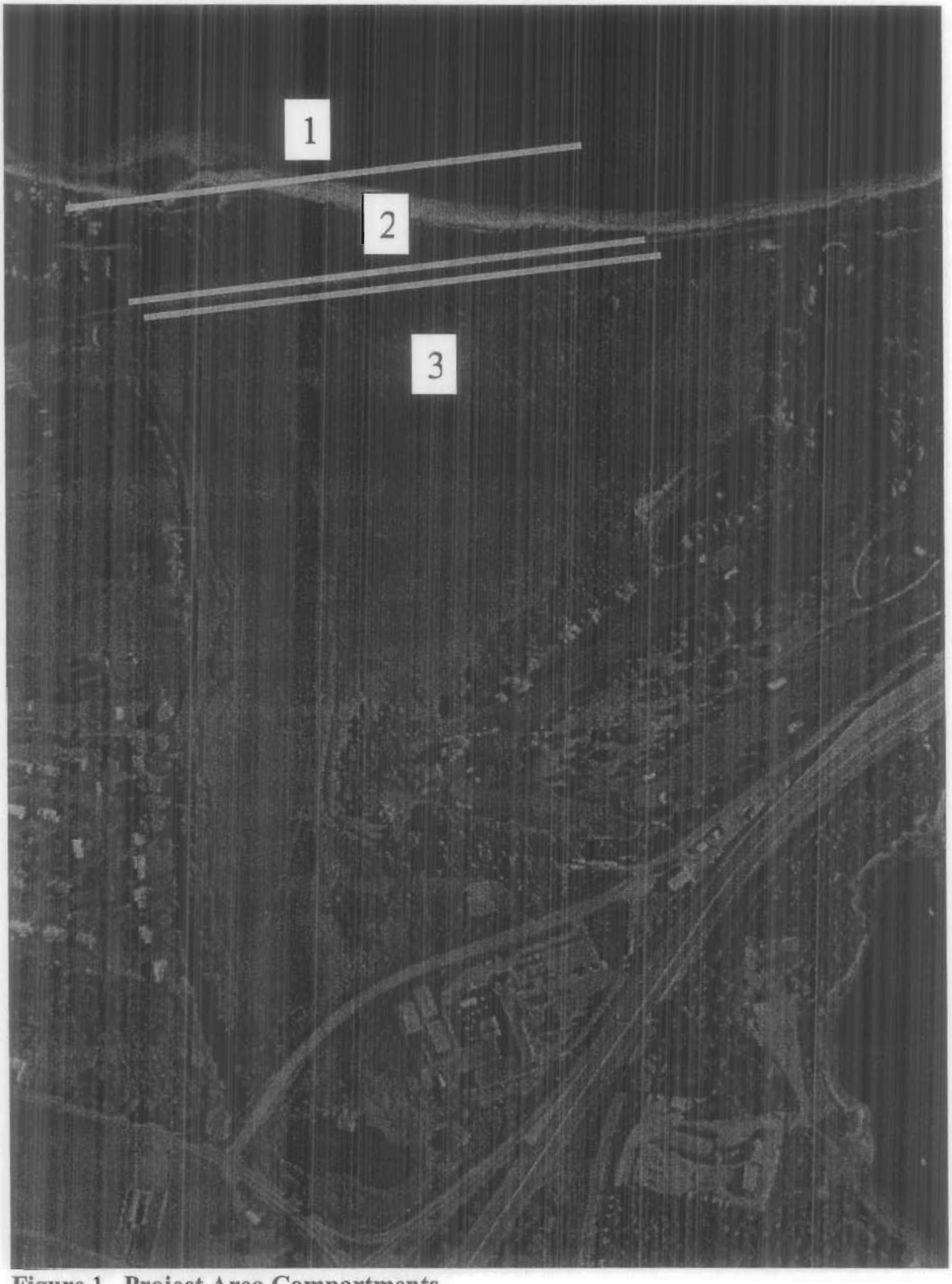

Figure 1. Project Area Compartments

Between elevation 0.88 m and 0.95 m (the adjusted upper elevation of high marsh), high marsh, Phragmites, or a mixture of the two may occur.

Figure 2 Town Pond Actual and Predicted Vegetation Ranges

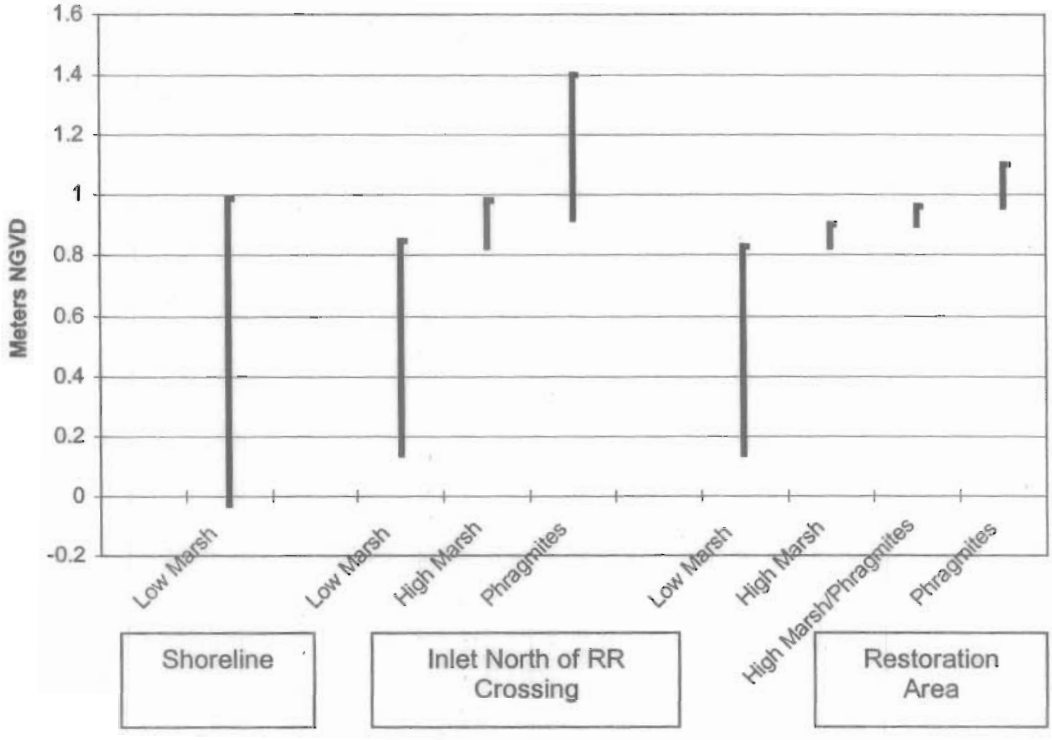

Table 1. Predicted elevations of habitat zones in the Town Pond restoration area after the restoration project is implemented.

Habitat Zone	Lower Limit (meters NGVD)	Upper Limit (meters NGVD)
Permanent open water	-0.4 (lowest graded elevation)	0.0
Mudflat (non-vegetated intertidal)	0.0	0.14
Low salt marsh	0.14	0.83
High salt marsh	0.83	0.88
Phragmites marsh/high marsh mixture	0.88	0.95
Phragmites marsh	0.95	not applicable

Elevations of Habitats Prior to Disposal

Figure 3 shows the location of an elevation transect through Town Pond prior to the disposal of dredged material. The Transect indicates that this portion of the marsh had a depth approximately equal to mean low water (MLW). Similar information for a transect nearer to the inlet indicates that the depth of Town Pond prior to dredged material disposal ranged to –2 feet MLW.

Salinity

Restoring tidal hydrology restores salt marsh at the expense of phragmites by increasing soil water salinity. Therefore, to be successful, the salinity concentration in the estuarine source of salt water must be at levels that will control phragmites. The concentration of soil water salinity required to restore salt marsh without common reed is about 20 parts per thousand (ppt) based on the pertinent literature (Howard et. al., 1978; Odum et. al., 1984; Mitsch and Gosselink, 1986; Garbisch, 1986; Sinicrope et. al., 1990).

Measurements of soil water salinity in the Town Pond inlet have been collected over several months at the project site (T. Gray, pers. comm, various dates 1998). This information indicates that salinity in the inlet near the railroad crossing is higher near the bottom ranging from 3.5 to 26 ppt in the data collected. Salinity ranged from 0 to 17 ppt at the surface.

Pilson and Hunt (1989) measured salinity in the vicinity of Town Pond in Mount Hope Bay and Narragansett Bay. The salinity in Mount Hope Bay was slightly lower than in Narragansett Bay ranging from 29.00 parts per thousand (ppt) near the surface to 30.53 ppt at the bottom, compared to 30.05 to 31.21 ppt at the nearest location in Narragansett Bay. These salinity concentrations are well within the range necessary to restore salt marsh plants. Mr. Thurston Gray, a volunteer for Save The Bay, sampled salinity at the railroad tracks over the inlet to the Town Pond site between June 1998 and April 2001. Salinity ranged from 0.0 to 26 ppt depending on the direction of the tide, rainfall, and other factors. Although these measurements indicate salinity levels that can result in a mixture of Phragmites marsh and salt marsh, when the volume of tidal exchange increases with the project, the salinity concentration will be sufficient to maintain salt marsh.

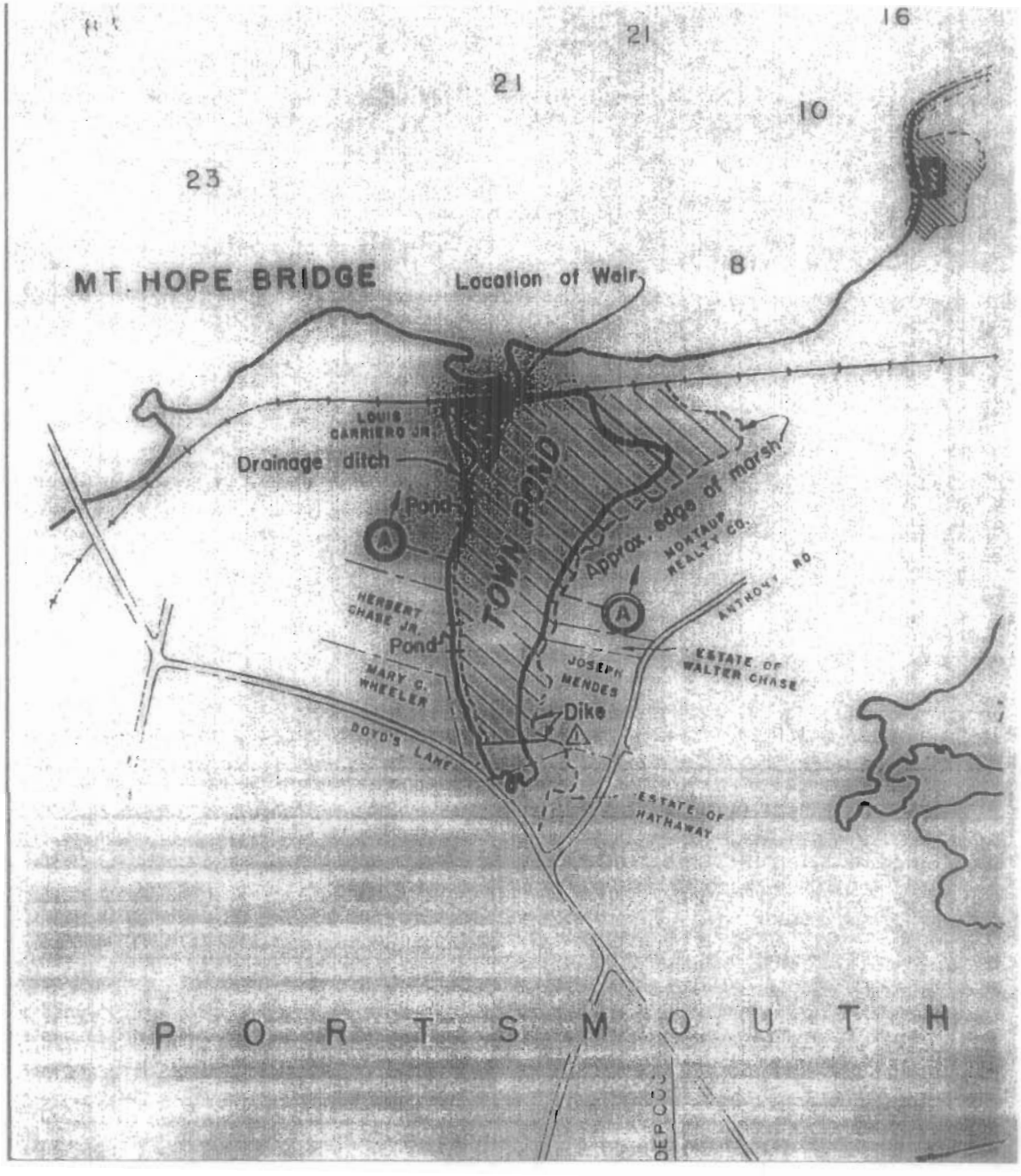

Figure 3. Location of Elevation Transect through Town Pond Prior to Disposal of Dredged Material

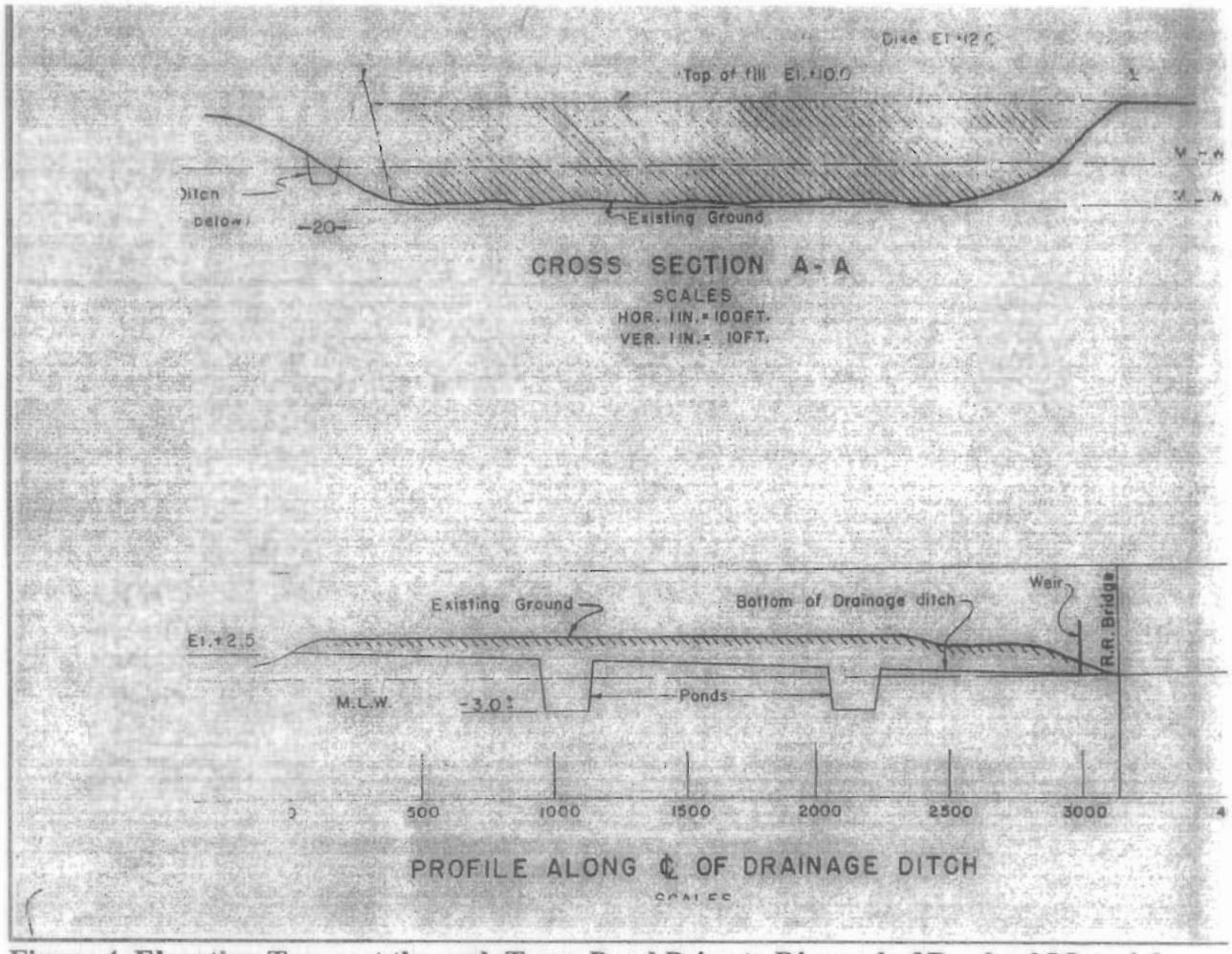

Figure 4. Elevation Transect through Town Pond Prior to Disposal of Dredged Material

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APPENDIX EA-E
MONITORING PLAN

Town Pond Restoration Project
Ecological Resources Monitoring Plan
February 4, 2002

Introduction

This monitoring plan has been developed for the planned restoration of Town Pond in Portsmouth, Rhode Island. The purposes of this monitoring plan are 1) to guide implementation and generate information to formulate minor adjustments in the plan or mid-course corrections; and 2) to measure the success of the project. All of the procedures in this plan will be performed by or under the guidance of the New England District, Corps of Engineers. The plan is intended to measure and ensure achievement of the goals and objectives established during planning. It is intended to be flexible to allow readjustment as new information and conditions develop.

Goals and objectives formulated during the early planning of the project are the basis for the establishment of monitoring criteria. Goals are the target functional attributes to be restored, such as water quality, hydrology, or wetland flora and fauna. Objectives are more precise, such as the specific characteristics of water quality to be achieved or the species composition of the various communities of biota to be restored. Performance indicators are specific, measurable quantities such as pH, amount of chlorophyll in a water sample, or Secchi disk visibility (NRC, 1992). The goals, objectives and performance criteria for this project are specified in this document.

Project Goals

- Restore a combination of salt pond, salt marsh, and intertidal mudflat that maximizes fish and wildlife habitat value within project constraints.
- Maintain the value of existing estuarine habitats in the tidal inlet downstream of the railroad embankment as much as practicable.
- Increase the habitat value for estuarine dependent fish and wildlife, while maintaining some cover for the existing wildlife community.
- Avoid increasing salinity in Founder's Brook.
- Cause no increase in flooding potential to surrounding uplands.

Objectives

1. Restore elevations and substrates at intertidal elevations (spring high water to mean sea level) that allow salt marsh plants and associated animal communities to recolonize the site. Increase

the abundance of salt marsh vegetation (e.g., salt marsh cordgrass (*Spartina alterniflora*), salt meadow grass (*Spartina patens*), spike grass (*Distichlis spicata*), black grass (*Juncus gerardii*), etc.) and decrease the dominance of common reed (*Phragmites australis*).

2. Restore salt marsh vegetation to the edges of the existing tidal inlet downstream of the railroad embankment.

3. Restore elevations and substrates at lower intertidal elevations (about mean sea level to mean lower low water) that allow invertebrates adapted to intertidal areas and the animals that feed on them to recolonize the site.

4. Restore permanent open water to allow populations of shallow subtidal invertebrates and possibly submerged aquatic vegetation and the animals that feed on them to recolonize the site.

5. Restore habitats in appropriate ratios to maximize use by fish and wildlife.

6. Maintain salinity concentration in Founder's Brook of 0 parts per thousand.

7. Ensure existing flood heights on surrounding uplands remain unchanged.

Project Objectives, Success Criteria and Methods

Objective 1: Restore elevations and substrates at intertidal elevations (spring high water to mean sea level) that allow salt marsh plants and associated animal communities to recolonize the site. Increase the abundance of salt marsh vegetation (e.g., salt marsh cordgrass (*Spartina alterniflora*), salt meadow grass (*Spartina patens*), spike grass (*Distichlis spicata*), black grass (*Juncus gerardii*), etc.) and decrease the dominance of common reed (*Phragmites australis*).

Success Criteria A: The area of the marsh flooded between once daily and two to eight times monthly is increased.

Method: Establish ten permanent sample stations at random locations within portions of the marsh between elevation 0.14 and 0.95 meters NGVD. (Apportion stations in high marsh and low marsh based on area and locate stations using GPS.) Install crest stage gauges at each station and determine the elevation of the station relative to a tidal datum. Determine the height of flooding of the marsh surface during neap and spring tides once each year for three years. Estimate the area flooded using surface water depth information and as built plans.

Success Criteria B: The soil water salinity is between 20 to 33 ppt in portions of the marsh between elevation 0.14 and 0.95 meters NGVD.

Method: At each of the ten marsh sample stations, measure the salinity of soil

water during low tides during the spring and neap tide phases in pits once per year for three years. Salinity will be measured using a hand refractometer.

Success Criteria C: The percent cover of salt marsh vegetation is increased in areas flooded once daily to two to eight times monthly.

Method: Establish ten permanent sample stations at random locations within portions of the marsh between elevation 0.14 and 0.95 meters NGVD. Measure the percent cover of vegetation (in cover classes) and height, number of stems and number of flowering stems of common reed in 0.5 m^2 rectangular quadrats. Perform this sampling once each year in late August to September at two, three, and five years after construction.

Objective 2: Restore salt marsh vegetation to the edges of the existing tidal inlet downstream of the railroad embankment.

Success criteria: The area of salt marsh vegetation on the edge of the creek is similar to the area of vegetation removed to realign the inlet.

Method: Measure the area of salt marsh vegetation removed prior to construction and after construction for a period of at least five years after implementation (measurements at two, three, and five years after construction).

Objective 3: Restore elevations and substrates at lower intertidal elevations (about mean sea level to mean lower low water) that allow invertebrates adapted to intertidal areas and the animals that feed on them to recolonize the site.

Success criteria: The intertidal zone of the restored habitat supports a benthic community comparable to similar habitats at other locations.

Methods: Collect benthic cores at five stations randomly located in the intertidal zone each year for three years following the completion of construction. Screen samples through a 0.5-mm sieve and identify and count all organisms to the lowest practical classification.

Objective 4: Restore permanent open water to allow populations of shallow subtidal invertebrates and possibly submerged aquatic vegetation and the animals that feed on them to recolonize the site.

Success criteria: The subtidal zone of the restored habitat supports a benthic community comparable to similar habitats at other locations.

Methods: Collect benthic cores at five stations randomly located in the subtidal

zone each year for three years following the completion of construction. Screen samples through a 0.5-mm sieve and identify and count all organisms to the lowest practical classification.

Objective 5: Restore habitats in appropriate ratios to maximize use by fish and wildlife.

Performance criteria: The ratio of open water to salt marsh is approximately one to one.

Methods: Collect true color aerial photography at a scale of 1 inch equal to 600 feet during December five years after implementation. Map cover types and compare to December 20, 1993 true color aerial photography.

Objective 6: Maintain salinity concentration in Founder's Brook of 0 parts per thousand.

Performance criteria: The salinity concentration in Founder's Brook is 0 parts per thousand.

Methods: Measure the salinity in Founder's Brook upstream and downstream of the road crossing prior to construction and once per year for three years following construction.

Objective 7: Ensure existing flood heights on surrounding uplands remain unchanged.

Performance criteria: Flood heights do not exceed those predicted by project modeling.

Methods: Measure flood height during normal tidal conditions and compare to predictions.