FINAL
Project Management Plan for Selected Beneficial Use Projects Along Coastal Mississippi

Prepared by CH2M HILL for the
Gulf of Mexico Alliance/Habitat Conservation and Restoration Team
in cooperation with
Mississippi Department of Marine Resources
Submitted to the
Gulf of Mexico Foundation
in accordance with
National Oceanic Atmospheric Administration
Cooperative award # NOAA GOMA 2003

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September 2011
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Executive Summary

The *Master Plan for the Beneficial Use of Dredged Material for Coastal Mississippi* (2011 Master Plan; Gulf of Mexico Foundation, 2011) was prepared to identify dredging projects and potential beneficial use (BU) projects along the Mississippi Coast. The Master Plan identified numerous BU projects in each of the three coastal counties. The goal of the 2011 Master Plan is to help facilitate BU dredging projects under the State of Mississippi's BU law (House Bill 1440, March 2010) to ensure the sediments of the Mississippi Sound stay "in the system," meaning within the Mississippi Sound. Based on the 2011 Master Plan, the Mississippi Department of Marine Resources (DMR) has implemented Phase 2 of the project, to choose three to four projects for each county and develop estimated costs and construction methods to move the projects forward from conceptual idea to construction.

The projects in the 2011 Master Plan were chosen based on the location's severity of erosion, the potential to improve habitat and reduce storm surge if the project area was restored, and if the project was relatively easy to permit and construct. This Project Management Plan (PMP) includes the highest ranked projects from the 2011 Master Plan. The PMP also includes a variety of BU projects to test the success of various dredging technologies and BU containment methods.

The information presented in this PMP was gathered from meetings, site visits, and discussions with local, state, and federal agencies. The site visits were useful in determining the general parameters of the projects and provided a more accurate understanding of each project, such as water depth and the width as well as characterization of the existing sediments and vegetation communities. With this information, project descriptions were developed to include more accurate data on the dredge material capacity of the potential BU site and types of containment structures needed to construct each site. Since not all sites were visited, information was collected from existing maps and discussions with DMR personnel who have extensive knowledge of the Coast.

Ten projects throughout Hancock, Harrison, and Jackson Counties are presented in some detail in this PMP. For each project, the description includes environmental concerns and benefits, quantities needed, types of material that could be placed at the site, containment options, potential issues, and cost estimates for construction.

This PMP is just the first step in developing new BU projects for coastal Mississippi. With passage of the State of Mississippi's BU law, finding capacity will require developing, permitting, and constructing new BU sites. This will be critical in keeping the state's sediments "in the system." These projects also facilitate the use of fine-grained materials, not just coarse-grained sands. Without capturing these materials, the options for BU and habitat restoration on the Mississippi coast would be very limited. As DMR moves forward with its BU program, new projects and cost estimates will need to be developed. The momentum that has been created in the past year will continue as new projects are developed, construction costs estimated, and projects constructed.

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Acronyms

BU	beneficial use
DMR	Department of Marine Resources (State of Mississippi)
DNR	Department of Natural Resources (State of Louisiana)
lb/ft^3	pounds per cubic foot
MsCIP	Mississippi Coastal Improvement Program
MSL	mean sea level
NOAA	National Oceanographic and Atmospheric Administration
OCPR	Office of Coastal Protection and Restoration (State of Louisiana)
PET	polyethylene terephthalate
PMP	Project Management Plan
POC	point of contact
SOPs	standard operating procedures
USACE	U.S. Army Corps of Engineers

SECTION 1

Introduction

The Mississippi Department of Marine Resources (DMR) has been working with federal, state, and private partners for nearly a decade to promote the use of dredged material and concrete rubble for coastal land and habitat restoration. In 2002, U.S. Army Corps of Engineers Mobile District (USACE) and DMR collaboratively developed the *Long-Term Comprehensive Master Plan for Beneficial Uses of Dredged Material Along Coastal Mississippi* (2002 Master Plan) as an initial plan for beneficial use. The 2002 Master Plan helped steer the early development of a Beneficial Use (BU) Program at Mississippi DMR.

In 2011, an updated *Master Plan Update for the Beneficial Use of Dredged Material for Coastal Mississippi* was developed with the Gulf of Mexico Foundation in cooperation with the Mississippi DMR. This updated 2011 Master Plan provides an overview of the existing sediment transport system in Mississippi, the laws and regulations that provide the permitting structure to be followed to establish beneficial use sites, options for dredging technologies, potential BU projects, and potential stakeholders. The goal of the 2011 Master Plan is to help facilitate BU dredging projects under the State of Mississippi's BU law (House Bill 1440, March 2010) by identifying and prioritizing areas within each coastal county where dredged material can be placed to help restore, nourish, and enhance the coastal marshes and wetlands of Mississippi.

This document, the Project Management Plan (PMP), has been developed as a supplement to the 2011 Master Plan to develop three to four BU projects for each coastal county for immediate permitting. Each project description includes initial concept designs for the prioritized projects, key environmental issues, and planning level costs for implementation. DMR will utilize this information to initiate permitting on the prioritized sites and facilitate BU opportunities within all three coastal counties. This PMP is the first phase in development of the potential BU sites identified in the 2011 Master Plan (Exhibit 1-1). Additional phases will be described in subsequent project management plans based on funding, habitat restoration and management priorities, and the need for additional capacity for BU sites.

Appendix A includes Standard Operating Procedures (SOPs) for the BU projects. These SOPs are intended to:

- Guide potential agencies, contractors, and dredge operators through the BU project process
- Outline DMR's expectations on how BU projects will be constructed and material will be placed
- Identify the existence of special conditions exist on a BU site

Like the Master Plan, it is expected the SOPs will evolve as permitting and construction of BU sites expand.

EXHIBIT 1-1

Site Location Map, Potential Beneficial Use Sites

Project Management Plan for Selected Beneficial Use Projects Along Coastal Mississippi

0 8

Approximate Scale in Miles

Site Location Map
Project Sites

GNV C:\GIS\Mississippi Images\MXDs\Site Location.MXD 09/12/2011

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SECTION 2

Project Descriptions

The Master Plan identified numerous projects along the coast that need restoration, protection, and/or enhancement (Exhibit 1-1). Many of the projects included in the 2002 Master Plan (USACE, 2002) and the 2003 Implementation Plan (USACE, 2003) are also included in the 2011 Master Plan and this PMP. The need to restore the coastal marshes of Mississippi has been an on-going issue. By updating the Master Plan and preparing this PMP, Mississippi DMR will have the information needed to have "shovel ready" projects conceptually planned when funding is available. The decision process to select three or four projects for each county included site visits to review the elements of the project and the potential issues for permitting the site as a BU site. The sites selected in this plan were chosen based on location, size (potential capacity as a BU site), historical shoreline or marsh loss (if known), habitat priorities, perceived urgency, and potential long-term benefits. In developing this PMP, each project was developed with the following components:

- Description and scope
- Potential sources of material
- Environmental benefits
- Public input
- Funding sources
- Potential issues
- Data needs
- Construction cost estimates
- A summary order-of-magnitude cost estimate

It is assumed that for many of these sites, the costs to place dredged material will be borne by the dredging entity. The critical issue right now is getting sites permitted for use as BU sites, thereby providing the capacity needed to accept material from existing and planned dredging projects. Initially DMR may have to invest in building containment or protection structures for new BU sites in order to ensure substantial recovery of Mississippi's dredged material resources.

2.1 Hancock County Projects

2.1.1 Tennessee Gas Pipeline

Description and Scope

The Tennessee Gas Pipeline project is located in the southwest corner of the state, near the Pearl River. Based on historical shoreline data, the pipeline was constructed at some point between 1953 and 1969. The site is an active pipeline buried within a canal. Since the pipeline was constructed, the canal has widened due to storms and erosion from tidal flow. A review of historical aerials illustrates the loss. The intent of this project is to help restore the marsh and the natural water flow by filling the canal with dredged material. Filling in

the canal will restore the hydrology of two bayous, revive an oyster fishery by improving water quality, and create natural protection against storm surge for communities to the north.

The area adjacent to the pipeline is a combination of low salt marsh at the southern end of the canal dominated by smooth cordgrass (*Spartina alternaflora*) and higher marsh near the northern end of the canal dominated by black needlerush (*Juncus roemerianus*). There is a mixture of other emergent marsh species including bulrushes (*Scripus sp*.), salt hay (*Spartina patens*), and salt reed-grass (*Distichlis spicata*) along this stretch of marsh. Higher elevations, where some of the original dredged material was placed, are vegetated by shrub species such as wax myrtle (*Myrica cerifera*), and false-willow (*Baccharis angustifolia*).

There are several options for this potential BU site. The canal can be permitted and filled with material from one dredging project or it could be used by multiple dredging projects for the disposal of material over time. For whatever method is used to fill the canal, the

EXHIBIT 2-1
Tennessee Gas Pipeline
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existing bayous intersected by the canal will need to be protected by dikes or plugs to ensure that placement of dredged material does not inadvertently flow into the bayous. Due to the high-energy environment of the canal's mouth as well as the bayou crossings during placement, it is suggested that riprap or sheet pile be used at the mouth of the canal as well as at each bayou crossing to ensure long-term stability.

During a site visit to the canal, spot depth checks were performed using the onboard boat depth finder. A general cross-section was determined based on these spot checks. Using this general cross-section as well as assuming fill elevation of 2 feet above mean sea level (MSL), a fill volume of approximately 510,000 cubic yards is estimated for the entire canal. Native marsh grasses should be planted to help eliminate erosion and enhance marsh restoration. A more detailed bathymetry survey will be needed to determine a more accurate volume.

It is expected that the canal would be filled starting at the northern end, moving south toward the Mississippi Sound. It is expected the material would be pumped in, using a pipe to more easily control placement of the material. This would enable access for the project to be filled in phases depending on the availability of material. The bayou crossings could be used as a logical terminus to divide the site into four separate dredging projects. Using the bayou crossings (shown as orange lines in Exhibit 2-1) as project phase boundaries eliminates the need for temporary containment dikes.

Eight separate containment dikes will be needed to close the canal at the four bayou intersections as well as at the Mississippi Sound. Sheet pile or a riprap type of dike should be used to prevent erosion from wave energy as well as from bayou flow. Approximately 3,640 linear feet of containment will be needed. Cost to install the dike will range from $396 per linear foot to $529 per linear foot.

Ranking. This project is ranked HIGH. This project was identified in the 2002 Master Plan and was one of the three projects for Hancock County outlined in the 2003 Implementation Plan. The project has been identified in a number of other restoration planning efforts for the Mississippi coast.

Environmental Benefits. Benefits of filling in this pipeline canal include closing an access point for saltwater intrusion and storm surge into marsh areas of Hancock County; restoration of the natural flow of adjacent bayous; and restoration of native marsh. Restoration of the marshes within the Coastal Preserve would provide numerous benefits. These marshes provide habitat for migratory waterfowl that frequent the marsh area. This area is also home to a number of rare and endangered species. The reestablishment of this marsh would preserve and enhance the Coastal Preserve and eliminate the canal as an avenue for storm surge to the local La France's boat ramp and bait shop located at the end of the canal. The project will also help lower the fecal coliform discharge into the Heron Bay area, and offer an associated potential to reopen oyster harvest adjacent in the Sound adjacent to the canal.

Project Sponsor(s) and Primary Point of Contact (POC). DMR BU Program. Much of the property is considered tidal wetlands and is already owned by the state. The marshes may fall under coastal zone management and management activities should be dictated by those guidelines.

Potential Issues. Recreational anglers use the canal as direct access from the Mississippi Sound to interior fishing areas and local boat ramps. Closing the canal will require a slightly longer boat ride for anglers.

Data Needs. Navigation charts, or other literature sources, supplemented by field depth readings may be used to define the site bathymetry; however, sufficient information to determine construction needs and costs from these sources could be limited. Therefore, additional bathymetric surveys of the canal will be needed to calculate more accurately the capacity of the BU site. Each one of the bayou crossings into the canal needs to be measured and evaluated to determine the best method of closing the canal opening. An evaluation of the existing adjacent marshes should be conducted to determine the correct mix of plants as well as elevation needed to restore the marsh. Prior to placing any dredged material in the canal, the material will be evaluated to determine if it is suitable for beneficial use.

Construction Costs (Estimate). Construction of containment structures for the four bayou crossings are estimated between $1,440,000 and $1,950,000. This range is dependent upon multiple variables, including cost to use riprap as a containment material. Costs were based on the total linear length, height, thickness, and slope for the containment dike, as well as the cost to purchase and place the riprap. The cost range for riprap is estimated to be between $75 and $100 per ton. To calculate a cost of a containment dike, design assumptions have been made: the average height of the riprap dike is assumed to be 8 feet (5 feet water depth and 3 feet above MSL) and the slope is assumed to be 1V:5H. A material-specific weight of 144 pounds per cubic foot (lb/ft^3), layer thickness of 3 feet, and porosity of 40 percent are assumed. Any construction efforts will be closely coordinated with Tennessee Gas Pipeline.

Public Input. This project was discussed with stakeholders at the Hancock County meeting in December 2010. Additional public involvement will be needed to proactively address local citizen concerns about the change of access to the Sound.

Authority/Funding Sources for Implementation. Generally, the costs of primary BU projects are to be borne by the dredging project. However, DMR will seek funding to establish BU projects and seek to recover costs in the form of use, tipping, or other fees.

2.1.2 Saint Joseph Point

Description and Scope. Saint Joseph Point (Exhibit 2-2) is part of the Hancock County Coastal Preserve. The point is part of the second largest continuous marsh area in the state. The boundary of this 13,570-acre coastal preserve includes all of the adjoining marshlands bordering the Mississippi Sound from the Pearl River to Point Clear. This saline marsh area includes several low ridges and small hummocks that are above mean high tide (DMR Coastal Preserves Web site). Most important of these areas are two chenier formations (beach ridges) Point Clear Island and Campbell Island. The islands of this marsh support several rare plant species including one of the rarest shrubs in the United States, the tiny-leaved buckthorn (*Sageretia minutiflora*), found on the midden. The marsh area is also well known for an abundance of waterfowl.

EXHIBIT 2-2
Southeast Coastline of Saint Joseph Point, June 2011
Project Management Plan for Selected Beneficial Use Projects Along Coastal Mississippi

Lands within this Coastal Preserve are either privately, locally, state, or federally owned. Much of the property is considered tidal wetlands and is already owned by the state.

The goal of this project is to restore Saint Joseph Point to historical shorelines that have been lost due to erosion and storm damage. For the past 60 years, Saint Joseph Point has experienced extreme marsh loss. Based on a review of historical maps, the point has seen well over 260 acres of land loss since the 1950s (National Oceanographic and Atmospheric Administration [NOAA] Office of Coastal Survey, 2011). In some locations, the loss has been over 1,600 linear feet of shoreline with over 1,000 feet of this loss occurring within the last 20 years. Restoring this area to conditions seen before the 1950s would help preserve and enhance many of the natural bayous and tributaries found throughout the area.

During a site visit to the point, spot depth checks were performed on a small area using the onboard depth finder. A general cross-section was determined based on these spot checks. Using this general cross-section as well as assuming fill elevation of 2 feet above MSL, a fill volume of approximately 3,400,00 cubic yards is estimated for the entire project area. Native marsh grasses should be planted to help eliminate erosion and enhance marsh restoration. A more detailed bathymetry survey will be needed to determine a more accurate volume.

Due to the volume needed to complete this project, it is assumed the site will need to be restored in phases. It is unlikely that one dredge project will have the necessary volume

needed to fill the BU site. The first phase could be located on the northeastern tip of the site closest to Bayou Caddy. Phases could continue towards the point on Heron Bay. It is expected the dredged material would be placed using a pipe and pump method. Using a pipe would allow more control on how and where the material is placed.

Approximately 9,000 linear feet of hard (riprap or sheet pile) containment in addition to approximately 12,000 linear feet of breakwater will need to be constructed. The hardened structure is needed to protect the BU site from wave and wind action. Exhibit 2-3 shows potential breakwater and containment locations. Cost to install the riprap containment will range from $446 to $595 per linear foot. Cost to install breakwater structures is assumed to be twice that of riprap along the shoreline, therefore cost estimates for a breakwater structure costs will range from $890 to $1,189 per linear foot. The project area will need to be studied further in order to establish breakwater and containment design and placement to provide the optimum design for sufficient wave attenuation.

EXHIBIT 2-3
Potential Breakwater and Containment Locations, Saint Joseph Point
Project Management Plan for Selected Beneficial Use Projects Along Coastal Mississippi

During construction, temporary containment could be used to help marsh plantings take hold into the recently placed dredged material. Hay bales, coir logs, or another natural material could be used as temporary containment that would naturally break down over

time. Cost for coir log material and placement typically ranges between $30 and $60 per linear foot depending on the water depth and wave energy on site.

One design that could help reduce erosion would be constructing a series of breakwaters placed off the point's coast to help dampen wave energy. These breakwaters could be made from a variety of materials including construction rubble, rock pile, or autoclaved aerated concrete. These breakwaters would create a low-energy environment suitable for oyster reefs as well as enabling a natural shoreline on Saint Joseph Point. For the shoreline located between breakwaters, riprap could be placed in areas along the shoreline exposed to higher wave energy.

In order to optimize breakwater design and placement, bathymetric surveys, wave data, and wind data will need to be collected. As part of the design, it may be necessary to conduct modeling to correctly understand how the breakwaters effect wave dissipation.

Ranking. This project is ranked HIGH. Restoring this coastline and the marshes included in the Coastal Preserves Program is of critical importance.

Environmental Benefits. Restoration of the marsh would help preserve one of the most significant coastal marshes in the state. Restoration of the marshes within the coastal preserve would provide numerous benefits including fundamental support for commercial fisheries production. These marshes provide habitat for migratory waterfowl that frequent the marsh area. This marsh is also home to a number of rare and endangered species.

Project Sponsor(s) and Primary POC. DMR BU Program. Much of the property is considered tidal wetlands and is already owned by the state. The marshes may fall under coastal zone management and management activities should be dictated by those guidelines.

Potential Issues. Potential impacts to historical sites and protected/threatened plant species will need to be addressed. Since most of the proposed restoration activity would be in water bottoms outside of the upper marsh and midden areas, potential impacts can be minimized; however, impacts to marine species would also have to be evaluated.

Data Needs. Additional bathymetric surveys will be needed to finalize the estimates of the capacity of the site and the quantity of dredged material that could be placed at this site. An evaluation of the existing adjacent marshes should be conducted to determine the correct mix of plants as well as fill elevation needed to restore the marsh. Prior to placing dredged material, the material will be tested to ensure it is suitable for beneficial use.

To assist in designing the breakwaters, bathymetric, wind, and wave data will need to be collected to help estimate breakwater lengths, position, and placement. A hydrodynamic model to simulate wave action and sediment movement could be created to better understand the coastal erosion in this area.

Construction Costs (Estimate). Construction of containment structures for the project is estimated $14,400,000 to $20,500,000. This range is dependent upon multiple variables. Costs include calculating the total linear length, height, thickness, and slope for the containment dike, as well as the cost to purchase and place the riprap. The cost range for riprap is estimated to be between $75 and $100 per ton. The average height of riprap is assumed to be 8 feet (5 feet water depth and 3 feet above MSL) and the slope is assumed to be 1V:5H. A

material-specific weight of 144 lb/ft^3, layer thickness of 3 feet, and porosity of 40 percent are assumed.

Cost is also dependent whether the project is divided into phases. Splitting the project into more phases will increase costs due to multiple mobilizations and temporary containment placement costs.

Authority/Funding Sources for Implementation. Generally, the costs of primary BU projects are to be borne by the dredging project. However, DMR will seek funding to establish BU projects and seek to recover costs in the form of use, tipping, or other fees.

2.1.3 Bayou Caddy

Description and Scope. Bayou Caddy and the western face of the bayou are eroding due to wave energy and tropical storm events. As part of a recently completed BU project, USACE constructed a containment area and filled a portion of the area with sand. The area proposed as a new BU site is immediately adjacent to the USACE site (Exhibit 2-4). This area is part of the Hancock County Marsh Coastal Preserve and is owned by the state.

This project would entail filling the open water area west of the USACE site with approximately 30,000 cubic yards of dredged material over 5 acres. For this project, any grain size of material would be accepted. The material would be pumped into the site. There is no need for containment berms since the material could be placed within this area and allowed to dewater naturally. The site is a depression isolated by USACE's recently constructed Bayou Caddy BU site.

It is expected dredged material would be placed in mounds, to an elevation of 3 feet above MSL. In addition to placement of dredged material, the area, once filled to capacity, would be planted with appropriate marsh grasses, with the ultimate goal of restoring lost marsh.

In addition to restoring marsh in the area west of the USACE BU site, there is an area in the waters east of Bayou Caddy in which concrete rubble has been placed, creating a "safe haven" for boaters. This area could also be used as a BU site and would be conducive to accepting material from multiple users and different dredging methods. It is estimated that this area could be filled with 200,000 cubic yards of material, yet retain a "safe haven" if needed.

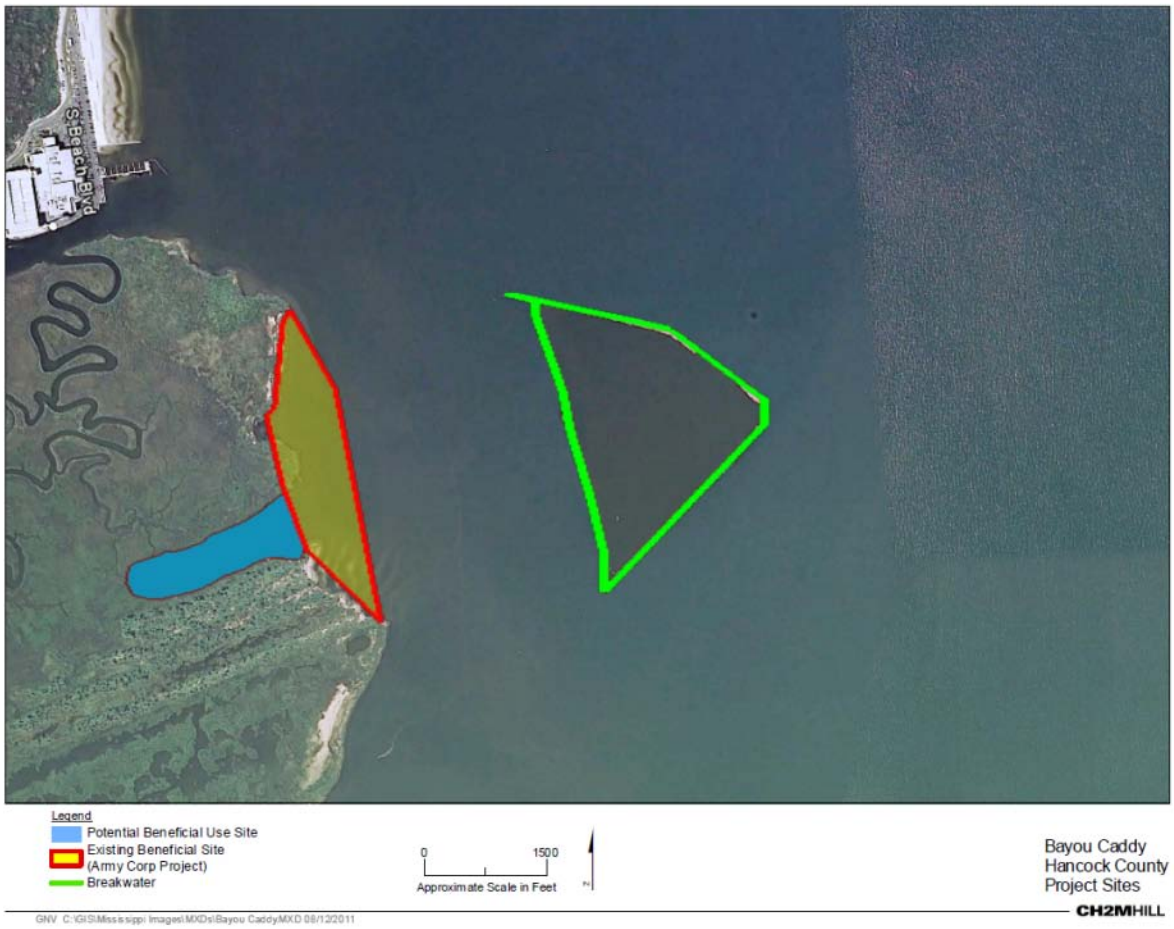
Ranking. This project is ranked HIGH due to significant marsh loss along the shore of this coastal marsh complex, which is part of a Coastal Preserve. It is critical that Bayou Caddy is restored to strengthen the long-term viability of the marsh and provide surge protection to the marina. This project was identified in the 2002 Master Plan and was one of the three projects for Hancock County in the 2003 Implementation Plan.

Environmental Benefits. In addition to the benefits of restoring the marshes within the coastal preserve, it would provide habitat for migratory waterfowl.

Project Sponsor(s) and Primary POC. DMR BU Program. Much of the property is considered tidal wetlands and is already owned by the state. The marshes may fall under coastal zone management and management activities should be dictated by those guidelines.

Potential Issues. There are no substantial issues associated with this site. Additional public involvement will be needed to proactively address local citizen concerns about the change in use of this area.

EXHIBIT 2-4
Bayou Caddy Potential Beneficial Use Site
Project Management Plan for Selected Beneficial Use Projects Along Coastal Mississippi



Data Needs. Additional bathymetric surveys will be needed to complete the permitting and design. An evaluation of the existing adjacent marshes should be conducted to determine the correct mix of plants as well as fill elevation needed to restore the marsh. Prior to placing material, the material will be tested to ensure it is suitable for beneficial use.

Construction Costs (Estimate). No containment structure is necessary. Project costs would be associated with studies to determine capacity for placement of dredged material. Estimated costs for studies would be approximately $50,000-150,000.

Public Input. This project was included in the 2002 Master Plan and was supported by local constituents. Additional public education or involvement would be beneficial during the permitting and design process.

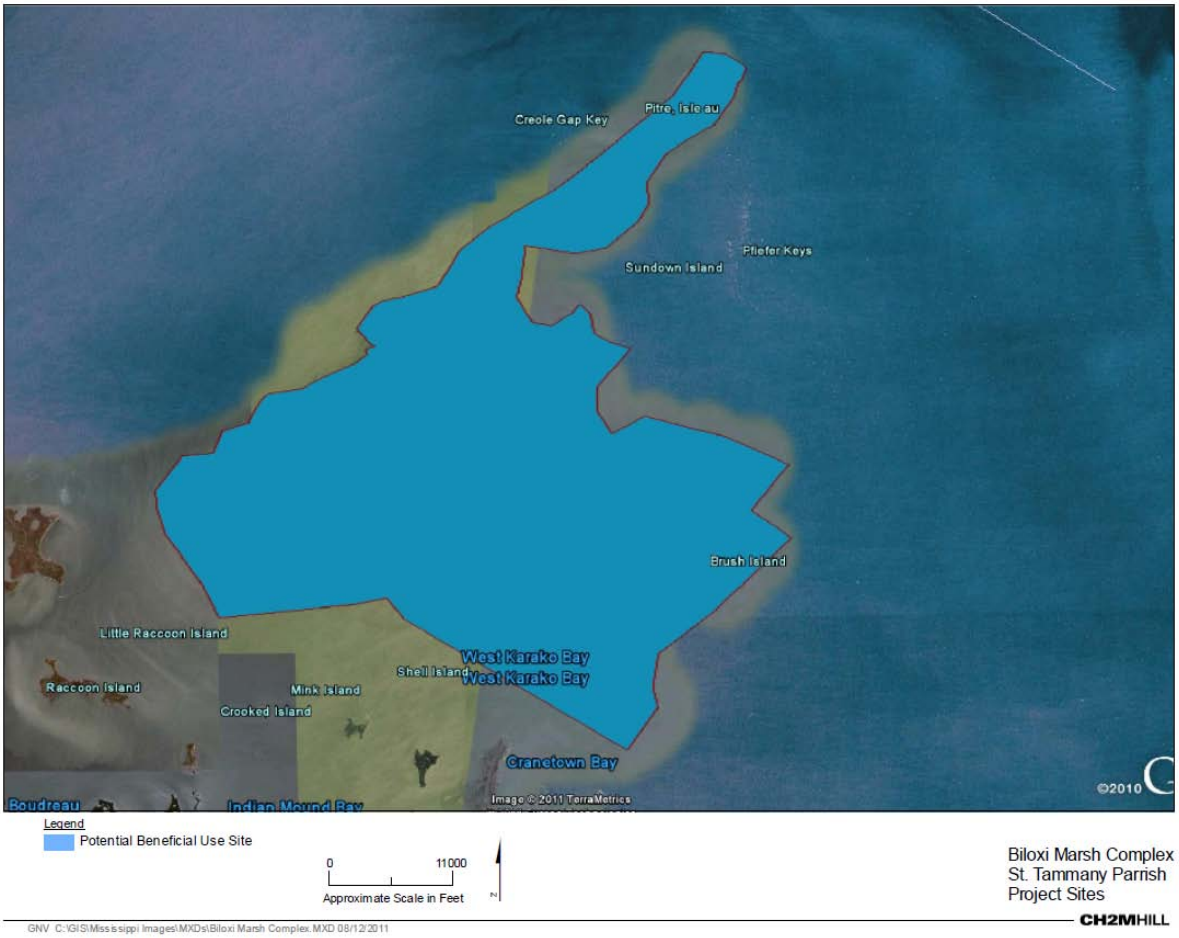
Authority/Funding Sources for Implementation. It is assumed that dredging projects in Hancock County will use this site as a BU site. Generally, the costs of primary BU projects

are to be borne by the dredging project. However, DMR will seek funding to establish BU projects and seek to recover costs in the form of use, tipping, or other fees.

2.1.4 Northeastern Outlying Islands - Biloxi Marsh Complex

Description and Scope. The islands south of Pearlington are an area of Louisiana called the Biloxi Marsh Complex. The area proposed as a BU site is referred to as the Northeastern Outlying Islands of the complex. While the proposed area is within Louisiana, restoration of these islands will provide storm protection for coastal Hancock County as well as enhance existing fisheries, providing economic support to commercial anglers and recreational fishing areas.

EXHIBIT 2-5
Biloxi March Complex Potential Beneficial Use Site
Project Management Plan for Selected Beneficial Use Projects Along Coastal Mississippi



The Biloxi Marsh estuary is comprised of 210,000 acres of coastal wetlands located approximately 30 miles southeast of the City of New Orleans between Chandeleur Sound and Lake Borgne. As compared to the entire complex, the Northeastern Islands have the highest amount of land loss in the Biloxi Marsh complex. Between 2001 and 2005, the land lost total almost 2,000 acres of wetlands. The Biloxi Marsh estuary is part of the Breton National Wildlife Refuge, managed by the U.S. Fish and Wildlife Service, which includes the federally-owned Chandeleur Islands and the Breton Islands.

This area is characterized by scattered islands, bays, and large open-water lakes, including False Mouth Bay, Bay Boudreau, Drum Bay, and Shell Island Lake. This area is under constant threat from erosion due to wave fetch across the exposed bays and lakes. This problem occurs on a daily basis and is exacerbated during tropical storm events.

This project would entail restoring wetlands using a variety of methods, with thin layer, spray or pump methods to fill open water or submerged marsh areas (Exhibit 2-5). For this project, any grain size of material would be acceptable. The material would be pumped into the site. Depending on whether the fill area was open water or marsh, the method used would be either spray or thin layer. Once the area reached a certain elevation, the material could be placed in mounds. There is no need for containment berms since the material could be placed within this area and allowed to dewater naturally.

In addition to placement of dredged material, the area, once filled to capacity, would be planted with appropriate marsh grasses, with the ultimate goal of restoring lost marsh.

Ranking. HIGH. This project is supported by DMR BU program and the Louisiana's Office of Coastal Protection and Restoration (OCPR).

Environmental Benefits. Restoration of this marsh area would support fisheries in Louisiana and Mississippi, provide storm surge protection to eastern New Orleans and western Hancock County, and help control salinities in the Mississippi Sound (a significant concern for DMR fisheries).

Project Sponsor(s) and Primary POC. DMR BU Program and Louisiana OCPR.

Potential Issues. Designating a site that covers two states is challenging because it will require additional agency regulatory approval. Issues of land ownership may also complicate the success of the project.

Data Needs Additional bathymetric surveys will be needed to support the permitting and design phases. An evaluation of the existing adjacent marshes should be conducted to determine the correct mix of plants as well as fill elevation needed to restore the marsh. Prior to placing material, the material will be tested to ensure it is suitable for beneficial use.

Construction Costs (Estimate). No containment structure is necessary. Project costs would include studies to determine capacity for placement of dredged material. Estimated costs for studies would be approximately $100,000 to $200,000.

Public Input. There has been no public input for this project. Additional coordination with Louisiana OCPR will be required.

Authority/Funding Sources for Implementation. It is assumed that dredging projects in Hancock County will use this site as a BU site. Generally, the costs of primary BU projects are to be borne by the dredging project. However, DMR will seek funding to establish BU projects and seek to recover costs in the form of use, tipping, or other fees.

2.2 Harrison County Projects

2.2.1 Wolf River Marshes

Description and Scope. The primary boundary of this 2,426-acre coastal preserve contains the non-forested marsh along the Wolf River from Grassy Point to where the marsh ends in Section 37. The preserve is a combination of pine/oak uplands and coastal plain.

The project area includes the extent of the lower Wolf River, DeLisle Bayou, and Bayou Portage which is dominated by needle rush with a mixture of duck potato and big cordgrass (*Spartina cynosuroides*). A narrow (1- to 2-meter) fringe of smooth cordgrass occurs along the edges of the creeks. The marshes in this area are similar to those along the edge of St. Louis Bay, including those along the northeast and northwest shore and the lower reaches of the Jourdan River. This unique location provides excellent feeding, resting, and wintering habitat for numerous types of migratory bird species, such as the Brown Pelican, White Pelican, Osprey, and Cormorants.

EXHIBIT 2-6
Wolf River Marsh Potential Beneficial Use Site
Project Management Plan for Selected Beneficial Use Projects Along Coastal Mississippi

The goal of this project is to recreate an island south of the mouth of the Wolf River in addition to re-establishing the peninsula just north of the mouth of the river. Approximately 420,000 cubic yards of material could be placed over approximately 43 acres. This project could be divided into two or three separate phases (Exhibit 2-6). One phase could be to recreate the historical footprint of the island south of the Wolf River marsh, while one or two additional phases could entail restoring the peninsula to historical boundaries.

This project allows the use of several different methods for containing dredged material. For the island located south of the river mouth, a riprap embankment (shown as red in Exhibit 2-6) could be constructed to protect the island from erosion. Protecting the island is important since it can act as wave barrier for the peninsula north of it. For the peninsula's shoreline, a combination of riprap and the Deltalok containment system (shown as green line in Exhibit 2-6) could be used along the riverbank and coast facing St. Louis Bay to prevent erosion due to wave action. This allows a more natural coastline that is also rigid enough to withstand moderate wave action. To allow a natural shoreline, temporary containment (show as orange in Exhibit 2-6) such as hay bales could be used along the shoreline facing Little Bay, where less wave action occurs.

Approximately 11,450 linear feet of riprap will be needed to protect the island (Phase 1). Approximately 5,700 linear feet of a riprap/Deltalok combination will be needed to protect the peninsula while approximately 3,100 linear feet of temporary containment will be needed for the north face of the peninsula. Cost to install riprap could range from $198 to $463 per linear foot. Cost to install temporary containment could range from $30 to $60 per linear foot.

Dredged material could be mechanically placed, using pumps, if surveys determine that the site has sufficient depth. Dredged material may need to be hydraulically sprayed if surveys reveal the site area too shallow to approach by boat.

Ranking. This project is ranked HIGH due to significant marsh loss along the shore of this coastal marsh and the proximity to the adjacent significant marsh complex.

Environmental Benefits. In addition to the benefits of restoring the marshes within the coastal preserve, the project would provide habitat for migratory waterfowl and enhance fisheries habitat.

Project Sponsor(s) and Primary POC. DMR BU Program. Much of the property is considered tidal wetlands and is already owned by the state. The marshes may fall under coastal zone management and management activities should be dictated by those guidelines.

Potential Issues. Residential development of the surrounding shoreline of the bay and adjacent inlets lands are a threat to the marsh.

Data Needs. Additional bathymetric surveys will be needed to support the permitting and design phases. An evaluation of the existing adjacent marshes should be conducted to determine the correct mix of plants as well as fill elevation needed to restore the marsh. Prior to placing material, the material will be tested to ensure it is suitable for beneficial use.

Construction Costs (Estimate). Construction of containment structures for entire project is estimated $3,000,000 to $4,000,000. Costs were based on the total linear length, height,

thickness, and slope for the containment dike, as well as the cost to purchase and place the riprap. The cost range for riprap is estimated to be between $75 and $100 per ton. The average height of riprap is assumed to be 7 feet (4 feet water depth and 3 feet above MSL) and the slope is assumed to be 1V:5H except for lengths where Deltalok is to be used. Lengths of containment dike using the Deltalok system will have an assumed riprap height of 4 feet to account for the water depth. A material-specific weight of 144 lb/ft^3, layer thickness of 3 feet, and porosity of 40 percent are assumed.

Public Input. There has been no public input for this project. Additional public education or involvement would be beneficial during the permitting and design process.

Authority/Funding Sources for Implementation. It is assumed that dredging projects in Hancock and Harrison Counties will use this site as a BU site. Generally, the costs of primary BU projects are to be borne by the dredging project. However, DMR will seek funding to establish BU projects and seek to recover costs in the form of use, tipping, or other fees.

2.2.2 Deer Island

Description and Scope. Habitat on Deer Island is comprised of a barrier island pond/ lagoon complex, polyhaline marsh, mesohaline marsh, slash pine maritime forest, and relic dune scrub. This habitat provides a feeding, resting, and wintering area for migratory birds, including the Brown Pelican and Cormorant. The preserve supports the Great Blue Heron Rookery and a number of rare and endangered species, including Brown Pelican, Sharp-Shinned Hawk, American Kestrel, Merlin, Snowy Plover, American Oystercatcher, Least Tern, and Southern Red Cedar.

Deer Island was one of the first BU sites along the Mississippi coast. USACE constructed a 50-acre site on the southeastern side of the island almost 10 years ago. A rock dike was constructed and dredged material was placed within the containment cell. Hurricane Katrina severely damaged the sand containment berm. USACE restored the sand berm on Deer Island in spring 2011.

As part of a new dredging project, the dredging applicant will construct a new containment area west of the existing BU site. This new site will also provide additional capacity on Deer Island for BU projects. Future BU projects on Deer Island include filling the lagoons created by the USACE Mississippi Coastal Improvement Program (MsCIP) project to restore the south shore of the island. USACE will use these lagoons for disposal of dredged material from maintenance dredging.

Another BU site is the former "Little Deer" island to the extreme southeastern end of the island. Restoration of Little Deer will help return the island to its historical 1850 footprint and will require approximately 1,100,000 cubic yards of material.

For the Little Deer project, a containment dike, approximately 7,500 feet long, would be constructed along the southeastern shoreline to help protect the BU site from wave action and eddies.

EXHIBIT 2-7
Deer Island Historical Shoreline
Project Management Plan for Selected Beneficial Use Projects Along Coastal Mississippi

Ranking. This project is ranked HIGH due to significant loss along the shore of this island, and because it supports the previous investments and ongoing restoration efforts. This project was identified in the 2002 Master Plan and was one of the three projects for Harrison County in the 2003 Implementation Plan.

Environmental Benefits. The expansion and stabilization of the island supports both habitat improvement and hurricane protection goals.

Project Sponsor(s) and Primary POC. DMR BU Program. Much of the property is considered tidal wetlands and is already owned by the state. The marshes may fall under coastal zone management and management activities should be dictated by those guidelines.

Potential Issues. Issues with Gulf sturgeon habitat impacts associated with filling water bottoms will need to be addressed in close consultation with the National Marine Fisheries Service.

Data Needs. Conducting modeling will help determine the best configuration of a containment structure using either engineered oyster structure or riprap to accommodate local water currents, wave action and sediment transport**.**

Construction Costs (Estimate). Construction of containment structures for the project is estimated $1,500,000 to $3,000,000. This range is dependent upon multiple variables. Costs include calculating the total linear length, height, thickness, and slope for the containment dike, as well as the cost to purchase and place the riprap. The cost range for riprap is estimated to be between $75 and $100 per ton. The average height of riprap is assumed to be 6 feet (3 feet water depth and 3 feet above MSL) and the slope is assumed to be 1V:5H. A material-specific weight of 144 lb/ft^3, layer thickness of 3 feet, and porosity of 40 percent is assumed. Costs for oyster shell structures are assumed less costly than rock riprap.

Public Input. Restoration of the island has received ongoing support. No direct public input on this project has been requested.

Authority/Funding Sources for Implementation. It is assumed that dredging projects in Harrison and Jackson Counties will use this site as a BU site. Generally, the costs of primary BU projects are to be borne by the dredging project. However, DMR will seek funding to establish BU projects and seek to recover costs in the form of use, tipping, or other fees.

2.2.3 Back Bay Marsh

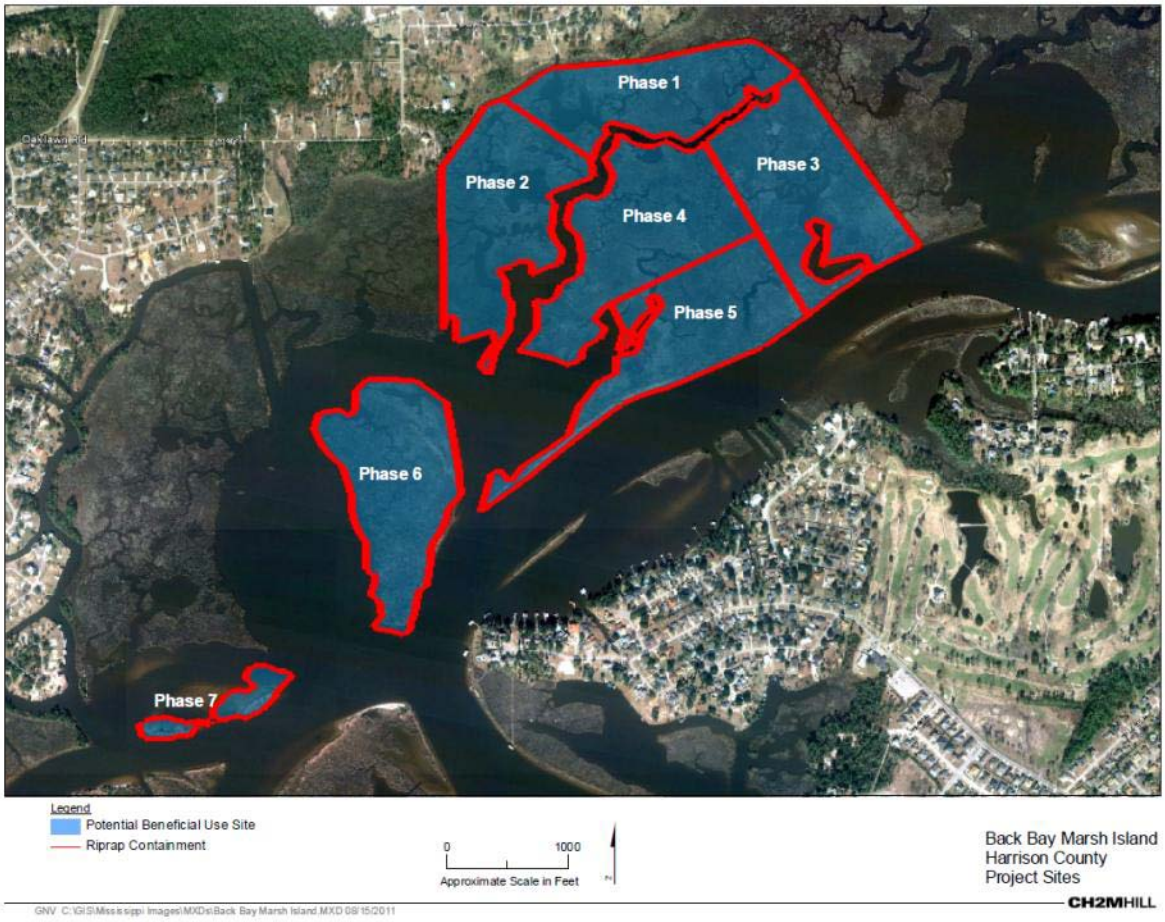
Description and Scope. The primary boundary of this 4,020-acre preserve follows the edge of the marsh along the Biloxi River, Tchoutacabouffa River, and Bernard Bayou, and includes the portions of marsh that are non-forested. The marshes in this area are similar to those found in the nearby lower Tchoutacabouffa River area to the east. The marsh is dominated by needle rush with duck-potato. Narrow disjoint bands of smooth cordgrass occur along the creeks with bands of high-level salt-meadow grass *(Spartina patens)* occurring along the upland borders. The lower reaches of Parker Creek consist of fringing tidal freshwater marsh, water lily beds, and submerged beds of coontail (*Ceratophyllum*). The marsh is a mixture of freshwater and species, including needle rush, duck-potato, pickerelweed *(Pontederia cordata),* and a variety of other grassed and sedges. Needle rush and duck-potato dominate the lower portions of the Tchoutacabouffa River. This unique location provides excellent feeding, resting, and wintering habitat for numerous types of migratory bird species, such as the Brown Pelican, White Pelican, Ospreys, and Cormorants. This area is also known to be an Osprey Rookery. Lands within this Coastal Preserve are either privately, locally, state, or federally owned. Much of the property is considered tidal wetlands and is already owned by the state.

This BU site covers over 200 acres of marsh habitat. This project proposes to enhance the existing marsh and restore its elevation. Surveys will need to be performed in order to determine which areas are more in need of material. Exhibit 2-8 shows a proposed phasing layout. Phasing is structured in a way so that habitat disturbance is minimized.

Approximately 300,000 cubic yards of dredged material could be applied to these areas. Depending upon the application method, temporary containment may be needed for each phase during construction to hold the dredged material and allow it to naturally de-water. To prevent future erosion and marsh loss, floating island mats could be used to border natural bayous. This will help reduce wave action as well as help contain sediment while

still giving a natural shoreline. These mats can easily be removed and relocated for future projects. Historical images show that shoreline along Phases 3 and 5 have slowly eroded over 60 years, with the worst loss being 60 linear feet. The entire length (approximately 4,200 feet) could be left natural and periodic re-nourishment could be performed every 20 to 50 years. Riprap could be placed on the perimeter of the islands (Phases 6 and 7) to help maintain the historical shoreline. Approximately 8,800 linear feet of riprap would be needed to surround all three islands. Costs include calculating the total linear length, height, thickness, and slope for the containment dike, as well as the cost to purchase and place the riprap. The cost range for riprap is estimated to be between $347and $463 per linear foot. Wind, wave, and bathymetric data will need to be collected to better determine how to design the containment structures.

EXHIBIT 2-8
Back Bay Marsh Potential Beneficial Use Site
Project Management Plan for Selected Beneficial Use Projects Along Coastal Mississippi



Ranking: This project is ranked HIGH. Restoring and enhancing this marsh would provide habitat for wildlife and fisheries as well as providing protection from storm surge.

Environmental Benefits. This unique location provides excellent feeding, resting, and wintering habitat for numerous types of migratory bird species, such as the Brown Pelican, White Pelican, Ospreys, and Cormorants.

Project Sponsor(s) and Primary POC. DMR BU Program. Much of the property is considered tidal wetlands and is already owned by the state. The marshes may fall under coastal zone management and management activities should be dictated by those guidelines.

Potential Issues. This area is bordered by some residential development and may experience significant boat traffic and associated wave action during and after construction. Appropriate measures will need to be implemented to protect against potential erosion and disturbance.

Data Needs. Additional bathymetric surveys will be needed to support the permitting and design phases. An evaluation of the existing adjacent marshes should be conducted to determine the correct mix of plants as well as fill elevation needed to restore the marsh. Prior to placing material, the material will be tested to ensure it is suitable for beneficial use.

Construction Costs (Estimate). Construction of containment structures for entire project is estimated $4,600,000 to $6,100,000. This range is dependent upon multiple variables including total linear length, cost to purchase and place material, height of riprap, riprap layer thickness, and slope. The material cost range used is between $75 and $100 per ton. The average height of riprap is assumed to be 7 feet (4 feet water depth and 3 feet above MSL) and the slope is assumed to be 1V:5H. A material-specific weight of 144 lb/ft^3, layer thickness of 3 feet, and porosity of 40 percent are assumed.

Public Input. There has been no public input for this project. Additional public education or involvement would be beneficial during the permitting and design process.

Authority/Funding Sources for Implementation. It is assumed that dredging projects in Harrison County will use this site as a BU site. Generally, the costs of primary BU projects are to be borne by the dredging project. However, DMR will seek funding to establish BU projects and seek to recover costs in the form of use, tipping, or other fees.

2.3 Jackson County Projects

2.3.1 Lake Mars Pier and Boat Launch

Description and Scope. The state owns approximately 5 acres of marsh off the bay of the mouth of the Biloxi River. Based on a review of historical shorelines, approximately 250 feet of shoreline has eroded since the 1950s. The marsh is adjacent to the Lake Mars Pier and Boat Launch. The marsh habitat here consists of salt meadow grass *(Spartina patens*) containing Olneyi bulrush (*Scirpus olneyi*), and salt marsh bulrush (*Scirpus robustus*) mixed with saltgrass (*Distichlis spicata*). In the area along the shoreline east of the boat launch, new marsh is developing in the silty sediments, with tall smooth cordgrass (*Spartina alterniflora)* being the primary new vegetation.

The project's goal would be to provide an area for the disposal of the maintenance material dredged from the boat ramp while restoring the shoreline and enhancing the existing

marsh. The maintenance material could be applied as a thin layer over existing marsh or shallow open water. Approximately 39,000 cubic yards could be placed in this location, creating approximately 4 acres of additional marsh. To protect the newly created marsh, riprap could be placed along the shore to protect against erosion. Another option would be to place a breakwater along the coast. This could help protect the shore as well as the pier from larger waves and allow for a natural shoreline.

EXHIBIT 2-9
Lake Mars Pier and Boat Launch Potential Beneficial Use Site
Project Management Plan for Selected Beneficial Use Projects Along Coastal Mississippi

Ranking. This project is ranked HIGH. This small area would provide an opportunity to enhance a marsh adjacent to the boat launch and provide additional opportunities for public awareness on the value of coastal restoration.

Environmental Benefits. Creation of this BU site would provide a disposal area for maintenance dredging of the boat launch.

Project Sponsor(s) and Primary POC. DMR BU Program. The project area is owned by the state. The marshes may fall under coastal zone management and management activities should be dictated by those guidelines.

Potential Issues. This is an active boat ramp public access point that would need to remain open during implementation of this project.

Data Needs. Additional bathymetric surveys, where possible, will be needed to support the permitting and design phases. An evaluation of the existing adjacent marshes should be conducted to determine the correct mix of plants as well as fill elevation needed to restore the marsh. Prior to placing material, the material will be tested to ensure it is suitable for beneficial use. Estimated costs for studies would be approximately $30,000 to $100,000.

Construction Costs (Estimate). An estimated 2,000 cubic yards of material would be dredged to maintain the boat ramp. Generally, the costs of primary BU projects are to be borne by the dredging project. No construction costs are planned as the material would be allowed to dewater naturally.

Public Input. There has been no public input for this project. Additional public education or involvement would be beneficial during the permitting and design process.

Authority/Funding Sources for Implementation. It is assumed the maintenance dredging of the boat ramp will use this site as a BU site. Generally, the costs of primary BU projects are to be borne by the dredging project.

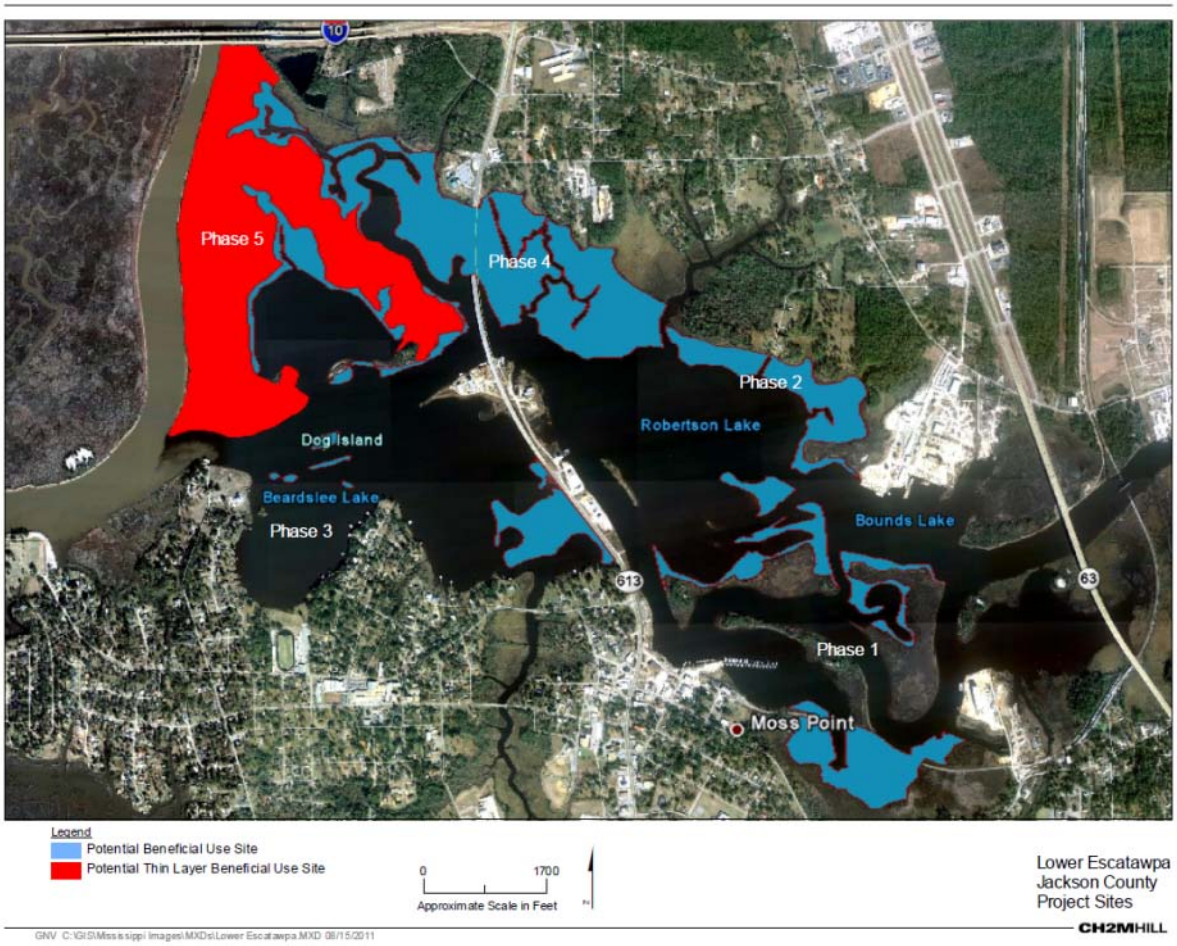
2.3.2 Lower Escatawpa

Description and Scope. The Escatawpa River Marsh is comprised of 2,826 acres along the edge of the estuarine marsh. This area represents a portion of the lower Escatawpa River that has been impacted by a combination of apparent saltwater intrusion associated with channel deepening and marsh impoundment caused by a rail crossing across the river and associated marshes. Despite the impacts, the marsh is recovering.

A tidally restricted sawgrass (*Cladium*)-dominated marsh exists to the east of the railroad crossing. Sawgrass dominates the marsh areas upstream of this site (that is, east, northeast) and some portions of marsh downstream. Dead cypress trunks are scattered about in the marsh near the center of the river. A needle rush marsh was constructed here about 10 years ago as mitigation for bridge and highway construction. This marsh appears to be doing well. A considerable portion of the mixture of sawgrass marsh and cypress swamp has been replaced by open-water and scattered patches of marsh dominated by needle rush. Ospreys have been seen here and may nest in this area. A little further upstream, in an area that is not currently within the primary boundary, there is a bald cypress/black gum swamp and bog that is part of the mid reaches of the Escatawpa River to the north.

Habitat in the preserve is comprised of muddy sand embayment, riverine estuary, cypress swamp, black gum swamp, and pitcher plant big. These habitats support a variety of species. It serves as a feeding, resting, and wintering location for migratory birds including the Brown Pelican, the White Pelican, Osprey, and Cormorants, and it serves as a breeding ground and nursery for the Osprey Rookery. Boaters and anglers use this site on an occasional and seasonal basis for waterfowl hunting and fishing.

EXHIBIT 2-10
Lower Escatawpa Potential Beneficial Use Site
Project Management Plan for Selected Beneficial Use Projects Along Coastal Mississippi



The project includes two types of potential restoration. One area (shown in blue on Exhibit 2-10) includes creating over 175 acres of marsh that have been lost since the 1950s. This loss is based on a review of NOAA maps. Approximately 850,000 cubic yards of material could be placed to restore lost marsh. These estimates are based off an assumed depth of 3 feet placed on 175 acres of land; a more detailed bathymetric survey will be needed to more accurately determine volume needed.

The other type of area (shown in red on Exhibit 2-10) is existing marsh that has deteriorated through the years. There is over 185 acres of marsh that could be replenished with a thin-layer application of dredged material. This application will require approximately 300,000 cubic yards of dredge material.

These restoration areas are too large for one project and would need to be completed in phases when dredge material is available. Where and how to place the material will depend on the amount of dredge material available. Material would need to be hydraulically pumped to many of the locations due to distances from navigable channels. Dredge material could be mechanically placed on shores along the deeper channel.

Temporary containment could be used if needed during the application of dredged material to ensure material is not lost during placement. For much of the marsh perimeter, BioHaven floating island mats could be used to help protect newly placed dredged material. These mats would help absorb and deflect wave energy, which would reduce interior marsh loss. These mats are made from recycled polyethylene terephthalate (PET) plastic and adhered together with polyurethane marine foam. Over 24,000 linear feet of potential restored marsh perimeter may need to be contained and protected. A mix of floating islands, temporary containment, oyster reefs, and riprap could be used. For the many islands to be restored, such as Dog Island, hard containment such as riprap, oyster reefs, or sheet piles could be used to prevent erosion. Cost to install riprap, including material, could range from $297 to $396 per linear foot. Cost to install temporary containment such as coir logs could range from $30 to $60 per linear foot and would depend upon water depth and wave energy.

Ranking. This project is ranked HIGH. Restoring and enhancing this marsh would provide habitat for wildlife and fisheries as well as providing protection from storm surge.

Environmental Benefits. This area represents a portion of the lower Escatawpa River that has been impacted by a combination of saltwater intrusion and marsh impoundment. Restoration of the marsh would provide numerous environmental. This marsh provides excellent feeding, resting, and wintering habitat for numerous types of migratory bird species, such as the Brown Pelican, White Pelican, and Cormorants. This area is also a rookery for Osprey.

Project Sponsor(s) and Primary POC. DMR BU Program. The project area is owned by the state. The marshes may fall under coastal zone management and management activities should be dictated by those guidelines.

Potential Issues. The primary threats to ecological integrity appear to be saltwater intrusion and impoundment of the area by the railroad crossing. Selection of the appropriate plants, based on salinity and hydrologic regime, will be critical for success of this restoration area.

Data Needs. Additional bathymetric surveys will be needed to support the permitting and design phases. An evaluation of the existing adjacent marshes should be conducted to determine the correct mix of plants as well as fill elevation needed to restore the marsh. Prior to placing material, the material will be tested to ensure it is suitable for beneficial use.

Construction Costs (Estimate). It is assumed that dredged material will be placed beneficially using either thin layer application to the existing marsh or placing the material in mounds, using a pipe to pump the material to the desired locations. Costs to gather the additional data needs would be approximately $50,000 to $150,000. Temporary containment structures to prevent erosion may be needed and it is assumed a combination of materials would be used. For estimation purposes, it is assumed 12,000 linear feet of riprap ($3,564,000 to $4,752,000) and coir ($360,000 to $720,000) would be needed.

Public Input. There has been no public input for this project. Additional public education or involvement would be beneficial during the permitting and design process.

Authority/Funding Sources for Implementation. It is assumed that dredging projects in Jackson County will use this site as a BU site. Generally, the costs of primary BU projects are

to be borne by the dredging project. However, DMR will seek funding to establish BU projects and seek to recover costs in the form of use, tipping, or other fees.

2.3.3 Round Island

Description and Scope. Round Island is a 30-acre site south of Singing River Island. The land is privately and state-owned. It provides feeding, resting, and wintering habitat for a variety of migratory birds and is a breeding area for the Great Blue Heron. Rare and endangered species supported on the site include the Osprey, the American Alligator, and the night-flowering Rubella. Most of the remaining island is covered in forest with a marshy interior. Six pairs of Osprey nest on the island and 30 or more pairs of Great Blue Herons have nested here in recent years.

EXHIBIT 2-11
Round Island Potential Beneficial Use Site
Project Management Plan for Selected Beneficial Use Projects Along Coastal Mississippi

Sub tidal (Mississippi Sound – sand bottom [near shore]) and intertidal (sand shore) communities are expected or known to occur. The site is used on a seasonal basis for limited waterfowl hunting and fishing.

Round Island has experienced significant beach erosion over the past 60 years due to storms and wave action. Historically, the areal extent of the island was approximately 150 acres, but is now only approximately 30 acres. This proposed project for Round Island would re-establish marsh, maritime forest, and beach area south of the existing footprint of the island, as well as replenishing shoreline around the entire island. A riprap containment structure or similar protection would be constructed south of the existing shore of the island, with dredged material placed behind. The BU project would be offset from the shoreline of the island to avoid issues of private ownership.

Approximately 3,300,000 cubic yards of dredged material could be placed to restore Round Island to its historical footprint and expand the footprint, creating a significantly larger island. Because of the severity of the shoreline loss, Round Island could have a layer of clay or any material placed as fill before placing sandy material.

DMR reviewed existing maps and delineated the proposed footprint based upon current bathymetric data. Detailed bathymetric surveys are needed as the project moves to conceptual design, permitting and construction.

During site visits, exposed clay layers were observed in many locations around the island. The presence of clay is an indication of the geologic foundation of the island differentiating its geologic structure from those of barrier islands. The presence of clay also indicates the continuing erosion of the land. The presence of sea grasses is a potential concern when filling water bottoms in this area. The area has historically supported sea grass, however, it was determined during the site visit that no sea grasses are present within the areas proposed for fill.

Ranking. The project was ranked a HIGH by the City of Pascagoula and by DMR BU Program. This project was identified in the 2002 Master Plan and was one of the three projects for Jackson County in the 2003 Implementation Plan.

Environmental Benefits. Restoration of the island would provide excellent feeding, resting, and wintering habitat for numerous types of migratory bird species, such as the Brown Pelican, White Pelican, and Cormorants. It would also provide some protection from hurricanes and associated tidal surges.

Project Sponsor(s) and Primary POC. DMR BU Program and the Port of Pascagoula would be the primary sponsors for this project. The project area (water bottoms) is owned by the state. The marshes may fall under coastal zone management and management activities should be dictated by those guidelines.

Potential Issues. Most of the island is privately owned therefore proposed restoration would be south of the island, within the state waters of the Sound. This project will require close coordination with the Secretary of State's office, which has responsibility for state water bottoms.

Data Needs. Additional bathymetric surveys will be needed to support the permitting and design phase and to calculate the capacity of the proposed BU site. An in depth sea grass study will be conducted to determine the presence of sea grasses (if any) within the proposed project area footprint. Prior to placing material, the material will be tested to ensure it is suitable for beneficial use.

Construction Costs (Estimate). Construction of containment structures for the entire project is estimated to range between $1,700,000 and $2,500,000. This range is dependent upon multiple variables, including total linear length, cost to purchase and place riprap material, height, layer thickness, and slope of the riprap. The material cost range is between $75 and $100 per ton. The average height of riprap is assumed to be 7 feet (4 feet water depth and 3 feet above MSL) and the slope is assumed to be 1V:5H. A material-specific weight of 144 lb/ft^3, layer thickness of 3 feet, and porosity of 40 percent are assumed.

Public Input. Restoration of the island has received ongoing support from the City of Pascagoula and area residents since the initial Master Plan was prepared in 2002.

Authority/Funding Sources for Implementation. It is assumed that dredging projects in Jackson County will use this site as a BU site. Generally, the costs of primary BU projects are to be borne by the dredging project. However, DMR will seek funding to establish BU projects and seek to recover costs in the form of use, tipping, or other fees.

SECTION 3

Next Steps

The 2011 Master Plan provides a framework for the DMR BU Program. This PMP, which includes conceptual costs and design for BU sites, provides the initial road map for the first group of BU sites along the coast. However, these are just the first steps in the process. The program is young and as it evolves, DMR anticipates the BU Program and processes will also evolve as BU sites are permitted, constructed, and filled.

The next immediate step for the BU Program will be to prepare permitting documents and more detailed engineering analyses for capacity and containment, and to consult with state and federal agencies to permit projects included in this PMP as BU sites. During the time the 2011 Master Plan and this PMP were being developed, numerous large dredging projects were proposed by state, federal, and private entities. Most of the material that will be dredged for these projects will be disposed of beneficially, but it will reduce the existing BU capacity of the state. There is an urgent need for more sites to be designated and constructed. With the passage of the 2010 BU law, local, state, and federal agencies recognize the value in "recycling" our sediments and keeping them in the system.

Looking toward the future, DMR will continue to evaluate areas for new BU sites to ensure there is continued capacity for dredging projects. New BU sites should vary in type to enable both large and small dredging projects, with different capabilities and budgets for disposal, to utilize a BU site.

In addition to designating BU sites, new funding is needed to construct initial BU site containment structures to kick-start the BU Program. Another issue will be to review existing legislation and determine how the BU Program can charge a competitive tipping fee that would be used to develop a revolving fund. The revolving fund could be used to construct new BU sites, enabling the BU Program and process to be self-funded.

It is assumed that other issues will develop that are unknown at this time; however, the Master Plan and the PMP provide a strong foundation for the BU Program.

SECTION 4

Summary

This PMP identifies BU sites for each of the coastal counties in Mississippi that should be designated as soon as possible to provide the capacity for material resulting from dredging projects along the coast. With the passage of the BU law in 2010, DMR has an urgent need to permit BU sites to ensure dredged material stays in the system. The following tables summarize the projects for each county, the capacity of the BU site, containment (if needed), and estimated cost range for construction.

EXHIBIT 4-1
Hancock County Project Summary
Project Management Plan for Selected Beneficial Use Projects Along Coastal Mississippi

Project	Beneficial Use Capacity (Cubic Yards)	Containment and Protection (Feet)	Low Range Cost	High Range Cost
Tennessee Pipeline	510,000	3,640 Riprap	$1,440,000	$1,950,000
Saint Joseph Point	3,400,000	9,000 Riprap 12,000 Breakwater	$14,400,000	$20,500,000
Bayou Caddy Marsh	30,000	Temporary or None Needed	$50,000 (studies)	$150,000
Bayou Caddy Safe Haven	200,000	None Needed	$50,000 (studies)	$150,000
Biloxi Marsh Complex-(Louisiana)	Unlimited	None Needed	$100,000 (studies)	$200,000

EXHIBIT 4-2
Harrison County Project Summary
Project Management Plan for Selected Beneficial Use Projects Along Coastal Mississippi

Project	Beneficial Use Capacity (Cubic Yards)	Containment and Protection (Feet)	Low Range Cost	High Range Cost
Wolf River Marsh	420,000	11,450 Riprap 5,700 Riprap/Deltalok 3,100 Temporary	$3,000,000	$4,000,000
Deer Island	1,100,000	7,500 Riprap	$1,500,000	$3,000,000
Back Bay Marsh Island	300,000	8,800 Riprap	$4,600,000	$6,100,000

EXHIBIT 4-3
Jackson County Project Summary
Project Management Plan for Selected Beneficial Use Projects Along Coastal Mississippi

Project	*Beneficial Use Capacity (Cubic Yards)*	*Containment and Protection (Feet)*	*Low Range Cost*	*High Range Cost*
Lake Mars Pier and Boat Launch	39,000	None Needed	$30,000 (studies)	$100,000
Lower Escatawpa	1,150,000	24,000 (Temporary): 12,000 Riprap, 12,000 Coir (if needed) or None Needed	$50,000 (studies) $3,924,000 temporary	$150,000 (studies) $5,472,000 temporary
Round Island	3,300,000	5,000 Riprap	$1,700,000	$2,500,000

SECTION 5

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Appendix A
Standard Operating Procedures

Standard Operating Procedures (SOPs)

The following are SOPs are provided for the process and construction techniques required by the Mississippi Department of Marine Resources (DMR) Beneficial Use Program. Applicants and dredging contractors will be expected to follow these SOPs for all BU projects.

SOP 1: BU Permitting Requirements

1. An applicant or its agent submitting an application for a dredging permit must provide a Dredge Material Disposal Plan. For a permit to dredge over 2,500 cubic yards of material, the Dredge Material Disposal Plan must include a BU option or the application will not be recommended for approval by the DMR Commission on Marine Resources.
2. The permit applicant should meet with the DMR BU Program Coordinator to discuss the proposed dredging project and the suitability of the material for BU, provide a rough estimate of the quantity of dredged material, and discuss potential BU sites available for the dredging project.

SOP 2: BU Project Guidelines

1. The applicant shall ensure that bid specifications incorporate DMR requirements for BU material suitability and placement.
2. After award, but before construction, DMR shall require a site visit with the winning contractor to confirm that the contractor understands the BU placement expectations and the permit requirements for the BU site.
3. DMR shall conduct periodic inspections of the BU site to ensure permit requirements are being followed.
4. The contractor shall not de-mobilize until DMR has completed a site inspection and provided the applicant with a written release.
5. The contractor shall be bonded with DMR listed as a primary or co-bondee (if the bond is to the applicant).

* It is strongly suggested that all potential contractors, bidding on a dredging project, attend a DMR-lead pre-bid meeting at the BU site to discuss DMR requirements for placement of dredged material. DMR strongly suggests that applicants chose a contractor with experience working on beneficial use and/or marsh restoration projects.

SOP 3: BU Site Operation Requirements for Contractors

1. The preferred method for the placement of dredged material at most BU sites is via hydraulic pumping. There are two general techniques that are recognized at this time:
   a. Spray/thin layer
   b. Open pipe, potentially with a method to maneuver the outfall end to create marsh mounds

   The technique used will depend on the BU site location, the percent solids of the dredged material, and the habitat goal for the BU site (i.e., marsh restoration, marsh enhancement, shoreline restoration, etc.).
2. Piped placement of material will typically involve a pump and a hopper barge set up. Most BU sites will be in open or shallow waters, making placement by methods other than piping difficult. In addition, areas that have existing shorelines where marshes will be restored or enhanced are fragile and equipment placed directly on a shoreline or inland area shall not be permitted.
3. Additional dredging for the construction of floatation channels to allow alternative placement techniques shall require a separate permit to be obtained by the party proposing such dredging. These actions shall be approved in writing by the DMR BU Program Coordinator prior to their approval.
4. Alternative methods for placement of dredged material such as bucket off-loading and placement will be considered but shall be approved in writing by the DMR BU Program Coordinator for the specific BU site prior to issuance of the dredge permit.
5. DMR strongly advises applicants to require potential bidders to attend a pre-bid meeting with DMR to discuss the BU Program and placement requirements. DMR also strongly advises applicants to consider, in the selection of a contractor, the contractor's experience with BU sites and attendance at the pre-bid site visit.

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