

# REAL ESTATE APPENDIX

## 1. Purpose and Scope

This Real Estate Plan is being submitted as the technical Real Estate document of the Coastal Mississippi Coastal Improvements Program (MsCIP) Interim Report. The preparation is in accordance with Engineering Regulation (ER) 405-1-12 and follows the general outline for feasibility reports. This Real Estate Plan is to be considered tentative in nature and for planning purposes only. A determination of actual boundaries of federally-owned lands and privately-owned lands has not been made.

Several assumptions were made for report purposes in regard to lines on ground and ownership determination. Both property acquisition lines and the estimates of cost are subject to change, even after this report is approved. Information in this Real Estate Plan Appendix is to be utilized for initial planning purposes only.

Hurricane Katrina struck the coasts of Louisiana, Mississippi, and Alabama on August 29, 2005. This hurricane produced a surge exceeding that of a fast moving Category 3 storm, causing high loss of life and property damage in the Louisiana, Mississippi, and Alabama coastal areas.

The storm surge from Hurricane Katrina peaked at 26 feet above mean sea level in Coastal Mississippi, inundating 800 square miles of the immediate coast destroying residences, businesses, port facilities, highways, bridges, and utilities, as well as damaging environmental resources of the area. In the wake of the storm, there are more than 280 lost lives and property damage estimated to be hundreds of billions of dollars.

A multi-objective, comprehensive technical evaluation is needed to determine the level of protection for a suite of critical design storms that are reasonably characteristic and could possibly impact the coastal areas of Mississippi. Opportunity exists within the USACE's water resources mission areas of hurricane protection, flood control, navigation, and ecosystem restoration. The Coastal Mississippi Interim Report (CMIR) will include, but not be limited to hurricane damage remediation opportunities within Hancock, Harrison, and Jackson counties of Mississippi:

## 2. Authority

The authority for this effort is provided by H.R. 2863, the "Department of Defense, Emergency Supplemental Appropriations to Address Hurricanes in the Gulf of Mexico, and Pandemic Influenza Act, 2006," which provides the authority and FY 2006 appropriations for, among other things, this effort. The analysis and design authority contained in the act reads as follows:

Provided, That using \$10,000,000 of the funds provided, the Secretary shall conduct an analysis and design for comprehensive improvements or modifications to existing improvements in the coastal area of Mississippi in the interest of hurricane and storm damage reduction, prevention of saltwater intrusion, preservation of fish and wildlife, prevention of erosion, and other related water resource purposes at full Federal expense: Provided further, That the Secretary shall recommend a cost-effective project, but shall not perform an incremental benefit-cost analysis to identify the recommended project, and shall not make project recommendations based upon maximizing net national economic development benefits: Provided further, That interim recommendations for near term improvements shall be provided within 6 months of enactment of this Act with final recommendations within 24 months of enactment.

### 3. Study Area

Those coastal counties in Coastal Mississippi affected by the hurricane surge were, from west to east, Hancock, Harrison, and Jackson Counties. The length of the coastline, which runs generally east and west, is 75 miles. The coastal area is bounded on the west by the Pearl River, on the east by the Alabama line, and on the south by Mississippi Sound. The latter is a partially protected body of water averaging 8 to 10 miles wide and separated from the Gulf of Mexico by a series of five barrier sand islands with rather large gaps or passes between the islands. Four of the five islands lie off the Mississippi coast. Proceeding from west to east the five are: Cat Island, Ship Island, Horn Island, Petit Bois Island, and Dauphin Island. The Gulf Intra-coastal Waterway traverses deep water in Mississippi Sound a few miles from the mainland shore. The mainland shore is broken by the entrances to St. Louis Bay between Bay St. Louis and Pass Christian, and Biloxi Bay between Biloxi and Ocean Springs. U. S. Highway 90 traverses the area a few miles inland except in Harrison County, where it closely borders the coastline. Two major rivers empty into Mississippi Sound, the Pearl River, which forms the boundary between Mississippi and Louisiana, and the Pascagoula River, which traverses Jackson County and enters the sound at Pascagoula. Coastal elevations vary generally from low-lying marsh reaches at the eastern and western extremities to relatively high ground near shore in the central portion. Major towns along the coast are, from west to east, Waveland, Bay St. Louis, Pass Christian, Long Beach, Gulfport, Biloxi, Ocean Springs, and Pascagoula.

Hancock County is the least populous of the three Mississippi counties. The western half of its 20-mile long coast is composed of low-lying salt marshes traversed by a number of small creeks and streams. The eastern half, which includes the towns of Bay St. Louis and Waveland, was afforded some protection by seawalls constructed along the Mississippi Sound shore by local interests at various times between 1915 and 1928. A paved highway adjoins the wall throughout. Most of the county lies below elevation 25 feet, although some of the inland Pine Hills rises to almost 250 feet. The Louisiana marshes, which enclose the western end of Mississippi Sound about 5 miles offshore, consist of innumerable tidal marsh islands of varying sizes separated by interconnecting bays and passages. The coastal area of Hancock County is separated from Harrison County by St. Louis Bay, an arm of Mississippi Sound.

The Coast of Harrison County extends for 27 miles between St. Louis and Biloxi Bays, and is urbanized throughout. Principal coastal towns are Pass Christian, Long Beach, Gulfport, and Biloxi. The relatively straight shore is protected by a concrete step-type seawall constructed in 1926-28. The seawall was rehabilitated and an artificial beach constructed along its seaward face in 1951, with Federal aid provided under authority of the 1948 River and Harbor Act (Harrison County Shore Protection Project). Except for about 13- miles at 5 feet, the top elevation of the seawall is either at elevation 8 or 11 feet above mean sea level, depending on the general elevation of the backshore area. The seawall and beach protects adjacent U. S. Highway 90. Cat Island and Ship Islands, portions of the Gulf Islands National Seashore, lie about 10 miles off the coast; Deer Island, a long narrow sand island in Mississippi Sound just offshore from Biloxi partially shelters the eastern part of that town as well as the mouth of Biloxi Bay. Back Bay of Biloxi, a landlocked, mile-wide westward continuation of Biloxi Bay, parallels the coast for about 10 miles. Separating it from Mississippi Sound is a peninsula about 2 miles wide occupied on the eastern end by the City of Biloxi.

The 28-mile coastline of Jackson County is bisected by the Pascagoula River, which empties into Mississippi Sound through an estuary just west of the City of Pascagoula. The only coastal towns of any size are Ocean Springs on the east shore of Biloxi Bay, Pascagoula, on the east bank of the lower 3 miles of the Pascagoula River, and Moss Point, adjoining Pascagoula on the north. The south section of Pascagoula faces Mississippi Sound and is protected to some extent by a low concrete seawall. A considerable portion of the coastal area of the county consists of low-lying salt

marshes, which extend in places as much as 4 miles inland. U. S. Highway 90 follows generally high ground a few miles inland and crosses the Pascagoula River delta by a 3-mile-long causeway and bridge. Horn Island and Petit Bois Island, both part of the Gulf Islands National Shore, lie about 10 miles offshore.

## **4. Real Estate Level of Detail for this Study**

Due to the magnitude of the study area, the level of detail provided by the other technical elements involved in this phase of the study is at a lower level than normally provided for a typical feasibility study. Due to the need to complete the interim report in a timely manner and the geographic extent of the study area, the level of analysis and engineering detail will be less than traditionally provided to support plan selection and a base line cost estimate for projects recommended for Congressional authorization.

Cost Estimates for Real Estate have been completed in a generalized sense for all of the sites.

These estimates, as well as some site-specific investigations will be used to develop a concept level estimate for all of the proposed sites. Government-owned or privately-owned lands were not mapped out or drawn at any of the proposed project locations. It is assumed that future projects that arise due to approval of the MsCIP Interim Report will allow for the Mobile District Real Estate Division to adequately provide detailed and accurate project information.

## **5. Cost Estimate Information**

Given the massive size of the study area, the broad conceptual nature and number of components, the level of detail for this phase of the study is based on estimates that would typically be encountered for a similar type project in a similar type area. On those projects where it has been determined that a real estate interest may be required from affected property owners, the number of ownerships was estimated based on aerial photographs and from data obtained from similar type projects in similar type areas. As this study progresses, these numbers and associated costs will be updated to reflect the actual number of ownerships affected based on data obtained from local tax and property records.

The contingency factor for each component was adjusted upward to cover unknown severance damages, actual number of tracts to be acquired, improvement costs, condemnations, and relocations assistance payments.

Estimates of values will be updated as individual project areas are developed, actual land boundaries are determined, and the number of landowners are known. All property cost estimates are based on sales data obtained by the Mobile District, information from County Property Appraisers/Assessors, county tract appraisal information, the Mobile District staff appraiser's general county wide knowledge, and actual land acquisition costs of lands already acquired by the Mobile District, Army Corps of Engineers.

### **5.1. Acquisition/Administrative Cost Estimates**

Acquisition/administrative estimates for the Non-Federal acquisition activities include costs that will be incurred during real estate acquisition for title evidence and insurance, appraisals, surveys, closings, condemnations, relocation assistance, temporary permits, and damage claims. The Federal acquisition/administrative estimates include costs for providing project oversight and assistance to the non-federal sponsor of these activities to assure compliance with Public Law 91-646. A certification of real estate for each project will be required prior to the advertisement of project

construction. Historical acquisition/administrative cost estimate data was relied upon in determining the proposed acquisition/administrative costs for each of the alternative plans addressed in this report.

### **5.2. Public Law 91-646 Cost Estimates**

Due to the limited information available and the magnitude of the study area, it was assumed that the proposed acquisition lines for each component would affect only a minimum amount of structures. For each of the components unknown improvement costs and relocations assistance estimates are covered in a higher than usual contingency cost added in for each component.

### **5.3. Real Estate Contingency Cost Estimates**

A real estate contingency factor of 25 – 50 percent was built into the real estate planning figures in estimating the cost for each of the proposed projects depending on the information and data that was available at the time of this report to allow for uncertainties associated with elements such as valuation variance, negotiation latitude, condemnation awards and interest, and refinement of boundary lines during ownership verification. It should also be noted that a 20 percent contingency has been applied to the real estate figures in the Engineer Appendix.

### **5.4. Offsetting Benefits**

It is established federal law that in the case of a partial acquisition, consideration must be given, in estimating the market value of the remainder property. Special benefits are those which are direct and peculiar to the particular property distinguished from the incidental benefits enjoyed to a greater or lesser extent by the lands in the area of the improvement. Special benefits need not be special need not be particular to a single parcel to be so classified, but may accrue to multiple parcels. Enhancement in some cases may exceed the value of the part taken plus damages to the remainder. Therefore, the compensation due the owner in some cases may be zero dollars. The appraiser will be familiar with and understand that under Mississippi law benefits to a remainder parcel may be used in offsetting the value of the part taken as well as the damages to the remainder.

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## 5.5. Recap of Costs

PROJECT	PROJECT PURPOSE	COUNTY	RE Costs
Bayou Caddy	Ecosystem Restoration	Hancock	\$15,000.00
Hancock County Beaches	Hurricane & Storm Damage Reduction	Hancock	\$15,000.00
Hancock County Streams	Flood Damage Reduction & Ecosystem Restoration	Hancock	\$363,000.00
Jackson Marsh	Ecosystem Restoration	Hancock	\$15,000.00
Clermont Harbor	Hurricane & Storm Damage Reduction	Hancock	\$15,000.00
Downtown Bay St. Louis	Hurricane & Storm Damage Reduction	Hancock	\$15,000.00
Cowand Point	Hurricane & Storm Damage Reduction	Hancock	\$15,000.00
Long Beach Canals	Flood Damage Reduction	Harrison	\$258,000.00
	Hurricane & Storm Damage Reduction & Ecosystem Restoration		
Harrison County Beaches	Restoration	Harrison	\$15,000.00
Courthouse Road	Flood Damage Reduction & Ecosystem Restoration	Harrison	\$15,000.00
Shearwater Bridge	Hurricane & Storm Damage Reduction	Jackson	\$15,000.00
Gautier Coastal Streams	Flood Damage Reduction & Ecosystem Restoration	Jackson	\$264,000.00
Pascagoula Beach Boulevard	Hurricane & Storm Damage Reduction & Ecosystem Restoration	Jackson	\$15,000.00
Upper Bayou Casotte	Flood Damage Reduction	Jackson	\$190,000.00
Franklin Creek Floodway	Flood Damage Reduction	Jackson	\$4,700,000.00
Total			\$5,925,000.00

**Note: Real estate costs are currently being revised. Revised costs contained in the Real Estate Appendix may not be reflected in the Main Report and Engineering/Cost appendices; however, revisions are not expected to affect either alternative screening, nor selection of the recommended actions contained herein. Final revised costs will be accurately reflected in all documents submitted to Congress.**

## 6. Recommended Projects

### 6.1. PROJECT: Bayou Caddy - Ecosystem Restoration, Hancock County, Mississippi.

The proposed project site is located along the shoreline of Mississippi Sound in Hancock County, Mississippi, south and west of the federally authorized Cadet Bayou navigation project. Cadet Bayou (otherwise known as Bayou Caddy) is a small coastal stream, draining most of southwest Hancock County, south of Interstate 10. It empties into Mississippi Sound. It is a federally authorized navigation project used by both commercial and recreation craft. Bayou Caddy has an exposed shoreline facing to the north and east. The north terminus of the project site is the entrance channel to Bayou Caddy. Hurricane Katrina has undermined and eroded the marsh habitat at the proposed project site. The Bayou Caddy marsh, located on the south side of the bayou, has experienced the highest degree of erosion along the Mississippi Coast, as a result of the storms of 2005.

The recommended plan for Bayou Caddy includes construction of an earthen containment structure placed along a 3900 linear foot semi-circular alignment. The earth dike would have a crest that is 8 feet wide and would rise 6 feet above the lowest low water tide. Bridge rubble would be placed on an alignment just outside the earthen berm. This will function as a protective breakwater for the inner containment structure. Dredged material, beneficially used from the maintenance of the federally authorized navigation channel, will be pumped into the containment structure. After consolidation, this newly developed 18-acre site will be planted to create a saltwater marsh habitat that will also

protect the existing marsh from further erosion. Because all construction and wetland creation is anticipated to be within state owned lands, no cost for the acquisition of additional real estate interest was estimated. However, the review and certification of the existing real estate interest required for this project will be necessary prior to advertisement of the construction contract. The total Federal and Non-Federal real estate cost for these activities is estimated to be **\$15,000**.

## **6.2. PROJECT: Hancock County Beaches – Ecosystem Restoration, Hurricane & Storm Damage Reduction, Hancock County, Mississippi**

The beaches of Hancock County are approximately 9 miles in length, and before the storms of 2005, the beaches possessed a dune system (pre-Katrina) that was maintained by local interests. The dune system was well vegetated and supported a significant ecosystem. It also provided a small measure of hurricane and storm damage reduction due to its ability to absorb some of the surge and wave energy during smaller events. Hurricane Katrina entirely destroyed the dune system by surge and wave action and almost all of its shorebird nesting areas were eliminated. The beach also served as a significant source of passive recreation for the county.

The recommended plan involves providing a dune atop the existing beach and adding a stabilizing fence and dune vegetation. The new stabilized dune will be 2 feet high with a crest width of 10 feet and side slopes of one vertical foot for every three feet in horizontal width. The material will come from an established upland borrow area. The plantings will have a density of 1 plant per 4 square feet and the fence will include the entire linear length of the project. It is anticipated that construction of the recommended plan will result in significant hurricane storm damage reduction/remediation. Other benefits would include prevention of saltwater intrusion, preservation of fish & wildlife with restoration of their habitats, prevention/remediation of erosion, and other related water resource purposes, such as ecosystem restoration or barrier island restoration.

All of the proposed modifications, access routes and staging areas under the current recommended plan are to be conducted within existing state or local government rights-of-way and no values for additional real estate interest are estimated. A review and certification of the existing real estate interest required for this project will be necessary prior to advertisement of the construction contract. The total estimated cost for these activities is estimated to be **\$15,000**.

## **6.3. PROJECT: Hancock County Streams – Flood Damage Reduction and Ecosystem Restoration, Hancock County, Mississippi**

The hurricanes of 2005 caused damage to drainage ways by blowing trees and other debris into these areas and by deposition of sediment in many areas of Hancock County, MS. There were many canals and drainage ways for low-lying areas near the coast that were affected. This document provides information regarding damage to the drainage ways of the developments or areas near Cowan Bayou and Hancock County Marina.

**Cowan Bayou** – The drainage canals in these subdivisions vary in width from approximately 15 ft. – 75 ft. with an average of approximately 45 ft wide. The Cowan Bayou canals total approximately 4.7 miles in length and are located along several middle income type subdivisions and or unimproved lands. The recommended plan for Cowan Bayou calls for the removal of approximately 2 ft of sediment over an average width of 45 ft and length of 4.7 miles.

It is assumed that the Non-Federal sponsor owns the right-of-way for these canals but may not own sufficient interest to allow for the proposed construction activities. The number of acres and ownerships along these canals that may be affected could increase or decrease upon a review of the property records and project limits. Until this is known, the cost estimate for this project will assume that additional real estate interest would be required to allow adequate area for the

construction equipment to access the canals and to remove the debris from the canals by truck. Should this additional real estate interest be required, a two year temporary work area easement 20 foot in width for the length along one side of the canals is being estimated.

Total length: 4.7 miles. Mixture of unimproved and residential properties on adjacent lands. Total estimated area of temporary work area easements: 11.2 acres at \$44,800; estimated acquisition costs for Federal and Non-Federal based on 50 ownerships is \$250,000; Total estimated amount for lands and damages under 01 account is \$294,800 or **\$295,000**.

**Hancock County Marina** – The drainage canals in this area are approximately 100 ft. wide and 300 ft apart. The canals total approximately 1.9 miles in length. The canals shoaled approximately 2 ft from the 2005 hurricanes. The recommended plan for Hancock County Marina calls for the removal of approximately 2 ft of sediment over an average width of 100 ft and length of 1.9 miles. Removal will be done by using a marsh buggy type back-hoe or other mechanical excavation equipment and dump trucks. It is anticipated that the most of this proposed work will be done within existing State or local government owned rights-of ways. However, there may be a need for additional access routes for the debris removal and a temporary 20 foot wide two year work area easement is recommended.

Total Length: 1.9 miles. Adjacent lands mostly unimproved with some residential. Total estimated area of temporary work area easements: 4.6 acres at \$18,400; estimated acquisition costs based on 10 ownerships is \$50,000. Total estimated amount for lands and damages under the 01 account is \$68,400 or **\$68,000**.

The total estimated real estate costs for this project is **\$363,000**.

#### **6.4. PROJECT: Jackson Marsh – Ecosystem Restoration, Hancock County, Mississippi**

Hancock County shoreline runs between Bayou Caddy and the City of Waveland and is fronted by Beach Boulevard, which is protected by a concrete seawall and existing beach. There are several tidal marshes in this area. These expansive and contiguous tidal marshlands are maintained through an exchange of tidal flow through conduits (outfalls) that connect via drainage canals. The tidal flow between Mississippi Sound and the marshes has been critically restricted from sedimentation as a result of Hurricane Katrina. The existence of these valuable marshlands is dependent upon the continuation of the tidal exchange provided through the outfalls. The recommended plan for Jackson marsh includes replacing existing outlet walls at 12 outlet structures with new vinyl sheet pile walls. The total wall length is 155 feet long with a pile length of 15 feet, each embedded 10 feet deep. The recommended plan also requires excavation of approximately 1,000 cubic yards of sand from within the drainage channel that will then be deposited behind the new walls. Implementing the recommended plan will result in the restoration of tidal flow, and the reduction of future hurricane/storm damage created by storm surge and waves. It will also serve to repair damages to natural resources created by 2005 storm events (primarily destruction of wetlands at this site) and the restoration of environmental resources damaged by 2005 storm events and enhancement of water quality.

Based on the conceptual design, it is estimated that all modifications, access and staging areas will be within existing state or local government owned rights-of-way, therefore no value estimate for additional interest in lands is included. However, the review and certification of the existing real estate interest required for this project will be necessary prior to advertisement of the construction contract. The total estimated real estate costs for these activities are **\$15,000**.

## **6.5. PROJECT: Clermont Harbor - Hurricane & Storm Damage Reduction, Hancock County, Mississippi**

Hancock County was heavily damaged by the hurricanes of 2005, particularly by the storm surge generated from Hurricane Katrina on August 29, 2005. The initial Hurricane Cindy (6 July), which hit southwest of Waveland, MS near Ansley, caused some damage to the seawall. Hurricane Katrina caused significant damage to the seawall. The energy from the storm surge damaged the structure at the toe causing fill material from beneath the road to be lost into Saint Louis Bay.

The existing seawall, Clermont Harbor Seawall, is a concrete stepped-face structure about 3 miles long and was constructed by local interests at various times between 1915 and 1928. Historical wave attack against the shoreline of Hancock County has caused migration of soil through or under the seawall and scour of soil below the seawall in various locations, resulting in damages to North Beach Boulevard and other infrastructure. Sections of the roadway have collapsed from time to time, disrupting and damaging utilities; causing hazards and delays for residents and vehicular traffic. Hancock County has frequently repaired the seawall and road due to the loss of material from beneath the highway.

The recommended plan for this project would consist of the installation of continuous interlocked vinyl sheet piling along the face of the lower-most step of the existing stepped seawall for the entire project length. The sheet pile bulkhead would be anchored to the seawall face using steel rock anchors. The void behind the bulkhead would be backfilled with gravel and sealed at the top with a reinforced concrete cap to the face of the seawall. It is anticipated that implementation of the recommend plan will result in the reduction of future hurricane/storm damage resulting from storm surge and waves and repair of damages to public facilities caused by 2005 storm events.

All of the proposed modifications, access routes and staging areas will be conducted within existing State or local government owned rights-of-way. Therefore, no value for additional real estate interest for lands is estimated. A review and certification of the existing real estate interest required for this project will be necessary prior to advertisement of the construction contract. The total real estate costs estimated for these activities are **\$15,000**.

## **6.6. PROJECT: Downtown Bay Saint Louis – Hurricane & Storm Damage Reduction, Hancock County, Mississippi.**

The City of Bay Saint Louis, located in Hancock County, was heavily damaged by the hurricanes of 2005, particularly by the storm surge generated by Hurricane Katrina on August 29, 2005. Approximately 20,000 people in this county were affected by flooding, and the destruction of businesses caused the unemployment rate to increase by more than 16% after the storm. Wave attack from the storm surge destroyed the main thoroughfare -South Beach Boulevard, seawall, beach, and all of the commercial and residential structures on both sides of the boulevard. Utilities located beneath the pavement and adjacent to the street were also lost, including water, sewer, natural gas, electric power, and electronic communications.

The recommended plan calls for replacement the damaged seawall with a new 6,500 foot long “T-Wall”. The wall would have an extended height of approximately 8 feet and incorporate pre-stressed concrete piles, a vinyl sheet pile cutoff wall, scour stone protection, and the installation of new storms drains. Approximately 160,000 cubic yards of material would be placed between the wall and a new, Federal Highway Administration constructed, South Beach Blvd. The anticipated benefits of the implementation of the recommended plan should be the reduction of future storm and hurricane-caused damage created by storm surge and waves, and the repair of damages to public facilities and natural resources to protect businesses and residences which are currently being reconstructed in the area.



All of the proposed modifications, access routes and staging areas will be conducted within existing State or local government owned rights-of-way. Therefore, no value for additional real estate interest in lands is estimated. A review and certification of the existing real estate interest required for the project will be necessary prior to advertisement of the construction contract. The total estimated real estate costs for these activities are estimated at **\$15,000**.

#### **6.7. PROJECT: Cowand Point – Hurricane & Storm Damage Reduction, Hancock County, Mississippi.**

Hancock County was heavily damaged by the hurricanes of 2005, particularly by the storm surge generated by Hurricane Katrina on August 29, 2005. The storm, caused damage to the existing seawall, but Hurricane Katrina caused significant damage to the seawall. Particularly, the energy from the storm surge damaged the structure at the toe causing fill material from beneath the road to be lost into Saint Louis Bay.

The study area extends along a paved road (North Beach Boulevard) in the City of Bay St. Louis for about 3 miles north from U S Highway 90. The study area is bordered on the east by St. Louis Bay. The existing seawall fronting St. Louis Bay is a concrete stepped-face structure about 3 miles long.

North Beach Boulevard is the main thoroughfare along the entire length of the existing seawall. Current wave attack against the shoreline of Hancock County has caused migration of soil through or under the seawall and scour of soil below the seawall in various locations, resulting in damages to North Beach Boulevard and other infrastructure. Sections of the roadway have collapsed from time to time, disrupting and damaging utilities, and causing hazards and delays for residents and vehicular traffic. Hancock County has frequently repaired the seawall and road due to the loss of material from beneath the highway. Damaged utilities, which have required repairs, include water, sewer, natural gas, electric power, and electronic communications.

The recommended plan to remediate this problem will consist of the installation of continuous interlocked vinyl sheet piling along the face of the lower-most step of the existing stepped seawall for the entire project length of approximately 5,000 feet. The sheet pile bulkhead would be anchored to the seawall face using steel rock anchors. The void behind the bulkhead would be backfilled with gravel and sealed at the top with a reinforced concrete cap to the face of the seawall, with a cast-in-place reinforced concrete cap. Once constructed, benefits should include the repair of damage caused by the hurricanes of 2005 and reduction of future hurricane/storm damage created by storm surge and waves.

All of the proposed modifications, access routes and staging areas will be conducted within existing State or local government owned rights-of-way and no value for additional real estate interest for lands is estimated. A review and certification of the existing real estate interest required for the project will be necessary prior to advertisement of the construction contract. The total estimated real estate costs for these activities is **\$15,000**.

#### **6.8. PROJECT: Long Beach Canals - Flood Damage Reduction, Harrison County, Mississippi**

Harrison County was heavily damaged by the hurricanes of 2005 particularly; the storm surge and winds generated by Hurricane Katrina on August 29, 2005. Hurricane Katrina had an adverse affect on canals and drainage ways due to the deposition of sediment from the storm surge and windblown trees, and other debris. There was damage to the drainage ways flowing into the upper portion of Bayou Portage causing the potential for increased flooding in the surrounding area.

The recommended plan to remediate the damages caused by Katrina is to increase the size of a culvert on Canal 2 and modify the canal geometry. A berm and diversion channel at the upper limits

would divert Turkey Creek over bank flows into the modified Canal 2. The 28- foot wide by 30-foot long bridge crossing the canal would be removed and replaced by a 28 foot wide by 120 foot long bridge, and would consist of 4 precast-prestressed concrete roadway spans with precast New Jersey Curb type side barrier walls, all supported on precast concrete bent caps and abutments and 14" square precast-prestressed concrete piling. For other bridges that cross the Canal, the stream banks would be altered using gabion sidewalls to steepen the banks to provide a nominally larger bridge opening while using the existing bridges.

For the bridge modifications, preliminary cost estimates were generated from conceptual designs. It is anticipated that the majority of all of the proposed modifications, access routes and temporary work areas will be within existing State or local government rights-of-way. However it is assumed that there will be a need for minor acquisitions adjacent to the project work areas to allow for construction activities and will comprise approximately 2 acres. The recommended estate for this would be a temporary work area easement with an estimated value of \$8,000. Since the limits of the diversion channel were not finalized at the time of this report, an estimate of 5 acres for perpetual channel improvement easements is factored in and 30 ownerships is estimated. The value estimated for the 2 acres of temporary work area easements and 5 acres of channel improvement easements is \$108,000.

The estimated value of the lands, Federal and Non-Federal acquisition cost for the 01 account is **\$258,000**.

#### **6.9. PROJECT: Harrison County Beaches – Hurricane & Storm Damage Reduction and Ecosystem Restoration, Harrison County, Mississippi**

Harrison County is home to the world's largest man-made beach. This Federally constructed project is 26 miles in length and has an average design width of 270 feet. Also included in the authorized project were storm water culverts, which pass beneath Hwy 90 and drain parts of Biloxi, Long Beach and Pass Christian. The county later added a sand dune system, which is home to over 1,000 Least Tern and Piping Plover nests. The project incurred extensive erosion from wind driven waves, debris scour, and storm surge from Hurricane Katrina. Most of the storm drains were also destroyed. Re-nourishment of the beach and repair of the storm drains will be accomplished under authority of Public Law 84-99. However, the extensive dune system was not part of the original Federal Project.

To remediate storm damages in this area the recommended plan will restore the existing dune line with the addition of stabilizing fencing and dune vegetation, to pre-Katrina conditions. The dunes would be placed on top of the Federal beach re-nourishment project. The finished stable dune will be approximately 5 feet high with a crest width of 10 feet. Approximately 681,000 CY of material would be required for the dunes, and could be constructed following the beach re-nourishment. Once constructed anticipated benefits include the reduction of future storm and hurricane-caused damage created by storm surge and waves, and the restoration of natural resources which create habitat for endangered species.

All of the proposed modifications, access routes and staging areas under the current recommended plan are to be conducted within existing State or local government owned rights-of-way and no values for additional real estate interest are estimated. A review and certification of the existing real estate interest required for this project will be necessary prior to advertisement of the construction contract. The total estimated real estate costs for these activities is **\$15,000**.

#### **6.10. PROJECT: Courthouse Road - Ecosystem Restoration and Flood Damage Reduction, City of Gulfport, Harrison County, Mississippi.**

The Courthouse Road Pier and boat launch facility, seawall, a sand beach fronting the seawall, and a concrete sheet-pile walled drainage channel was devastated by Hurricane Katrina. Coordination with other agencies revealed that plans were underway to repair most of these facility elements. Existing wetland and the drainage channel were overlooked when repair assistance requests were submitted. The wetland prior to the storm consisted of low and high salt marsh environments. It was completely destroyed and its ecosystem functions and values were eliminated during this single event. The drainage channel is a key component of the near shore community's storm water drainage network. Without competent lateral bracing, the drainage channel walls are in danger of failing and compromising the flood damage reduction performance of the drainage network.

To address these damages the recommended plan of action calls for the drainage channel lateral braces to be replaced by reinforced pre-cast concrete braces anchored to the pile wall cap. Additionally approximately one-third of an acre of marsh would be created, composed of approximately 6,300 square feet of high marsh and 7,900 square feet of tidal marsh. High marsh wetlands would be established by grading the existing sandy soils and adding soils to suit for planting high marsh species. Tidal marsh would be established by placing suitable soils and planting tidal marsh plant species. Anticipated benefits of the recommended plan are the restoration of emergent tidal wetlands habitat and hurricane storm damage repair.

All of the proposed modifications, access routes and staging areas under the current recommended plan are to be conducted within existing State or local government rights-of-way and no values for additional real estate interest are estimated. A review and certification of the existing real estate interest required for this project will be necessary prior to advertisement of the construction contract. The total estimated real estate costs for these activities is **\$15,000**.

#### **6.11. PROJECT: Shearwater Bridge - Hurricane & Storm Damage Reduction, Jackson County, Mississippi**

The Bridge is located on Shearwater Drive in Ocean Springs, MS on a paved road at the east end of Ocean Springs harbor. The existing timber retaining walls protecting both approaches and abutments to the bridge are failing. The timber has deteriorated and the walls were inundated by the storm surge, which caused additional failure and loss of fill material. This bridge also is a local evacuation route. Another strong storm surge could cause the bridge to fail or the approaches to become impassable.

The recommended plan to remediate these damages calls for the installation of continuous interlocked vinyl sheet piling along both sides of the north and south approaches of the bridge. The total length of sheet pile wall would be approximately 675 feet. The sheet pile bulkheads would be anchored to each other by using steel tie rods under the roadway; the bulkhead would be backfilled with gravel and sealed at the top with a reinforced concrete cap. Under the recommended plan, existing State or local government owned rights-of-way appear to exist for any proposed modifications, access and or staging areas and no values for additional real estate interest are estimated. A review and certification of the existing real estate interest required for this project will be necessary prior to advertisement of the construction contract. The total estimated real estate costs for these activities is **\$15,000**.

## **6.12. PROJECT: Gautier Coastal Streams - Hurricane Storm Damage Reduction and Ecosystem Restoration, Jackson County, Mississippi**

The hurricanes of 2005 caused extensive damage to the drainage ways of Gautier. Runoff from approximately 3000 homes is normally conveyed to the Mississippi Sound via manmade and natural bayous. However, the 19 foot surge created by Hurricane Katrina deposited trees, sediment and other debris into drainage ways, severely limiting their capacity to drain the region. It is estimated that an average of 3 feet of sediment was deposited in nearly 75,000 square feet of drainage ways for the areas of Old Spanish Trail, Graveline Bayou, Hiram Drive, Ladnier Drive, and Seacliff Bayou. The excess sediment has also interrupted the saltwater exchange to the marsh along Bayou Graveline.

The recommended plan to address the damages from Katrina includes removing sediment and debris along five separate drainage ways and bayous. The average widths of the channels are approximately 50 feet with an average sediment depth of approximately 3 feet.

Removal will be done by using marsh buggy type back-hoe or other mechanical excavation equipment and dump trucks. Anticipated benefits of the recommended plan include the reduction of future storm and hurricane-caused damage created by storm surge and waves, and the repair of damages to natural resources and drainage ways. This would benefit businesses and residences which are currently being reconstructed in the area. Most of the adjacent lands to these drainage ways are unimproved and or semi-rural. Under the recommended plan, it is estimated that the majority of the work will be done within existing State or local government rights-of-way. However, until property records are reviewed to determine the extent of ownerships, a 20 ft wide two year temporary work area easement along most of the drainage ways on one side is being estimated to allow access for construction equipment to remove debris that is excavated. The estimated costs for each of the five drainage ways is estimated as follows: The temporary construction area easement values were figured using an average of \$25,000 per acre for the fee value with an 8 percent average return per year for use of the property. The Non-Federal acquisition cost was based on \$4,000 per ownership. The Federal acquisition cost for oversight and review of PL -91-646 was estimated at \$1,000 per tract.

**Old Spanish Trail** v Total length: 1,750 ft. Mostly unimproved or wooded lands with a golf course comprising most of the adjacent lands. Total estimated temporary work area easement: .8 ac at \$3,200; 2 ownerships at \$10,000. Total estimated amount for lands and damages under 01 account is: \$13,200 or rounded up to **\$15,000**.

**Graveline Bayou** – Total length: 6,900 ft. Majority of adjacent lands are unimproved and wooded suggesting large ownerships. Total estimated temporary work area easement: 3.1 ac at \$12,400; 10 ownerships at \$50,000. Total estimated amount for lands and damages under 01 account is: \$62,400 or rounded up to **\$62,500**.

**Hiram Drive Site** – Total length: 2,640 ft. Majority of adjacent lands are unimproved and wooded. Total estimated temporary work area easement: 1.2 acres at \$4,850; 12 ownerships at \$60,000. Total estimated amount for lands and damages: \$64,850 or **\$65,000**.

**Ladner Road** – Total length: 1,150 ft. Majority of adjacent lands are semi rural and residential. Total estimated temporary work area easement: .52 acre at \$2,080; 8 ownerships at \$40,000. Total estimated amount for lands and damages: \$42,080 or **\$42,000**.

**Seacliff Bayou** – Total length: 2,440 ft. Mixture of semi rural, residential and unimproved. Estimated area: 1.1 ac at \$4,480. 15 ownerships at \$75,000. Total estimated amount for lands and damages: \$79,480 or **\$79,500**.

The total estimated real estate cost for Gautier Coastal Streams is **\$264,000**.

### **6.13. PROJECT:** Pascagoula Beach Blvd. – Hurricane & Storm Damage Reduction and Ecosystem Restoration, Jackson County, Mississippi

The City of Pascagoula, located in Jackson County, was heavily damaged by the hurricanes of 2005. Approximately 95 percent of the City of Pascagoula became inundated during Hurricane Katrina. Beach Boulevard is the main thoroughfare along the City of Pascagoula shoreline. Wave attack from the storm surge destroyed portions of the road, damaged the seawall and natural resources, and devastated all of the structures along the boulevard.

The recommended plan for remediation of these damages includes the repairing the damaged seawall and construct an engineered beach and dune system over a reach of approximately 7,700 linear feet. The restored beach would consist of placing approximately 270,000 cubic yards of material creating a beach 180 feet wide and 5 feet in depth. The dune placed on top of the beach would add another 5 feet of protection. The installation of new storms drains would also be included as well as fencing and plantings on the dune. If implemented benefits of the recommended plan include the reduction of future storm and hurricane-caused damage, the repair of damages to public facilities, and the restoration of historical beach resources which would protect businesses and residences which are currently being reconstructed in the area.

All of the proposed modifications, access routes and staging areas under the current recommended plan are to be conducted within existing State or local government owned rights-of-way and non values for additional real estate interest are estimated. A review and certification of the existing real estate interest required for this project will be necessary prior to advertisement of the construction contract. The total estimated real estate costs for these activities under the 01 account is **\$15,000**.

### **6.14. PROJECT:** Upper Bayou Casotte Flood Damage Reduction, Jackson County, Mississippi

Jackson County was heavily damaged by the hurricanes of 2005 particularly, the storm surge and winds generated by Hurricane Katrina on August 29, 2005. Hurricane Katrina had an adverse affect on canals and drainage ways due to the deposition of sediment from the storm surge and windblown trees, and other debris. There was damage to the drainage ways flowing into the upper portion of Bayou Casotte causing the potential for increased flooding in the surrounding area.

To remediate these damages the recommended plan requires removal of approximately 2 ft of sediment over an average width of 15 ft and length of 2.71 miles. There appears to be significant debris in the drainage way, especially at some of the culverts, which would also have to be removed to facilitate removal of the sediment. Construction would be done by using marsh buggy type back-hoe or other mechanical excavation equipment and dump trucks. Material could be stockpiled to drain with temporary work areas and hauled to a land fill area, since some debris is involved.

Much of the adjacent lands for the length of the project are residential on one side of the drainage ways and are unimproved or wooded on the opposite side. It is anticipated that the majority of the proposed work will be conducted within existing rights-of-ways for these drainage ways that are owned by the local government. However, until a review of the property records has been done to verify the ownerships that may be affected, a two year 20 foot wide temporary construction area easement is been recommended along either side of each drainage way to allow access for construction equipment and to allow for removal of the debris. Should these easements be required, it is recommended that they be acquired from the side that is non-residential or unimproved to minimize the number of ownerships that may be affected.

The estimated amount of temporary construction area easements is 6.5 acres valued at \$26,276; acquisition costs of 32 ownerships for Federal and Non-Federal is \$160,000. Total estimated amount for lands and damages under the 01account is \$186,276 or **\$190,000**.

#### **6.15. PROJECT: Franklin Creek Floodway (Community of Pecan) – Flood Damage Reduction, Jackson County, Mississippi**

This area within Coastal Mississippi, specifically the community of Pecan in Jackson County, Mississippi, near the Alabama-Mississippi state line, was heavily damaged by the hurricanes of 2005, particularly by the storm surge generated by Hurricane Katrina on August 29, 2005.

The community of Pecan is an extremely low-lying and flood-prone community of approximately 30 residences, with no commercial or industrial structures. Average first floor elevations are less than 10 feet NGVD. The storm surge associated with Hurricane Katrina reached elevation 14.2 feet NGVD at Pecan which caused extensive flooding due to the low ground elevations throughout the area. Four and a half feet or more of storm-surge water inundated numerous residences within the community.

Many of the homes flooded during Hurricane Katrina were inundated by rising waters issuing from the Escatawpa River. This caused Franklin Creek overflow its banks into the Pecan community at the height of the Hurricane Katrina storm surge. Sediment and debris carried by the surge into many areas of the system which further impeded the flow through these drainage systems. This sediment and debris has exacerbated the existing problem. Currently this area is even more susceptible to inundation from smaller hurricanes, tropical storms, or even severe rainfall events.

The recommended plan consists of the purchase and removal of approximately 30 structures or residences remaining within the community of Pecan, Mississippi. When residential structures and land are purchased for the purpose of evacuating the floodplain, the structures are demolished and the land is no longer available for residential or commercial development. The recommended plan does provide complete elimination of all future flood damages within the community of Pecan. The recommended plan has the support of Jackson County, the State of Mississippi Emergency Management Agency, FEMA, and the Mississippi Department of Marine Resources.

#### ***Estimation of Permanent Relocation Benefits (PL 91-646)***

If approved, it is recommended that the acquisition relocation program for the Franklin Creek Floodway (Community of Pecan) be administered under the provisions of P.L. 91-646. In accordance with those provisions, residential and nonresidential property owners determined to be eligible only for acquisition were offered the fair market value for their real property (structures and land). In addition to the fair market value of their flood plain property, residential owners will be offered standard relocation benefits under P.L. 91-646 to assist in the purchase of a comparable replacement home of their choice located out of the inundation area. Under Public Law Uniform Relocation Act benefits for the displaced residents are based on standards of “comparable” and “decent, safe and sanitary” replacement dwellings. A family unit living together is equal to one occupant. Relocation costs are estimated based on the assumption that the owner and tenant occupants meet 180 and 90-day occupancy requirements. The impact area is located in a very low-income area of Jackson County and most of the dwellings exhibit a high degree of structural obsolescence. Until further refinement of individual property owner information, all costs are estimated as if all structures were owner occupants. Therefore, the maximum payments allowable under the Act are applied to estimate payments appropriate for displaced residents in each area.

It is also anticipated that finding replacement housing as required under PL 91-646 for these owners will be difficult due to the numerous homes that were destroyed from Hurricane Katrina. Should

comparable and Decent, Safe and Sanitary (DSS) replacement housing not be available for these owners at the time this plan is implemented, new construction may be considered and may be the only alternative. Due to this probability, a higher than normal cost is being factored in for this estimate to allow for the additional cost for a comparable replacement dwelling.

A detailed Relocation Plan will be required in the next study phase that will include a market survey of the area and a gross appraisal for each of the proposed residents that would be displaced. This plan will provide the details and updated costs for implementing relocation of the residents to be displaced. It should be noted that a Policy Decision on the use of eminent domain and on the occupancy requirement of these residents will be required.

Due to the complexity of a fee acquisition and the relocation of a resident, a higher administration cost must be factored in to ensure that these displaced persons have been provided with adequate assistance as required under PL 91-646. The total estimated cost for implementing the buy out plan including the Federal and Non-Federal administrative costs is **\$4,700,000**. This does not include any costs for demolition or removal of the structures.

## **7. Non-Federal Sponsor-Owned Project Lands**

More detailed discussions and identification of lands and interests owned by the cooperating public entities will be discussed in more detail in subsequent design documents as more detailed site information is determined.

## **8. Federal Government Owned Land**

Because of the nature of the study, federally owned lands are not under consideration for the project needs.

## **9. Navigational Servitude**

Determination of the applicability of navigational servitude is currently under review. It is assumed that portions of the lands needed for the project are subject to navigational servitude. If it is determined that navigational servitude is not applicable to this project the real estate supplement will be modified accordingly. Since some of the project lands are owned by the State of Mississippi below the MHWL (subject to Navigational Servitude). This will require coordination with the State of Mississippi to utilize these lands for project purposes.

## **10. Induced Flooding**

At present, all components were valued as if fee title would be required. Whether there will be flooding induced by the construction or the operation and maintenance of the various components of the project has not been analyzed.

## **11. Estates to be Acquired**

Before any project is constructed, Real Estate Division must identify the minimal real estate interest needed to acquire the lands necessary for access and construction of the proposed project. Once the appropriate interest is determined as described above, the corresponding standard estate must be used as explained and identified in Chapter 12 to ER 405-1-12. The Corps has standardized the real estate interests it requires in terms of "estates", time-tested language used to create the

provisions for the grants. Any substantive deviations from these standard estates require the recommendation of the Real Estate Division and approval from our Washington headquarters, which can be a lengthy process. Copies of the aforementioned standard easement estates are attached to this Real Estate Plan for reference below. The estates are generic in nature and will be crafted to supplemental documentation as required.

For the MsCIP Interim Report and under the current recommended plans, the recommended estates for those projects requiring an interest in lands from the property owners that may be affected by the project is the standard "Temporary Work Area Easement" and the standard "Channel Improvement Easement".

### **Temporary Work Area Easement**

*A temporary easement and right-of-way in, on, over and across (The land described in Schedule A) (Tracts Nos. \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_), for a period not to exceed \_\_\_\_\_, beginning with date possession of the land is granted to the United States, its representatives, agents and contractors as a (borrow area) (work area), including the right to (borrow and/or deposit fill, spoil and waste material thereon) (move, store and remove equipment and supplies and erect and remove temporary structures on the land and to perform any other work necessary and incident to the construction of \_\_\_\_\_ Project, together with the right to trim, cut, fell and remove therefrom all trees, underbrush, obstructions, and any other vegetation, structures, or obstacles within the limits of the right-of-way; reserving, however, to the landowners, their heirs and assigns, all such rights and privileges as may be used without interfering with or abridging the rights and easement hereby acquired; subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.*

### **Channel Improvement Easement**

*A perpetual and assignable right and easement to construct, operate and maintain channel improvement works on, over and across (The land described in Schedule A) (Tracts Nos. \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_) for the purposes as authorized by the Act of Congress approved \_\_\_\_\_, including the right to clear, cut, fell, remove and dispose of any and all timber, trees, underbrush, building, improvements and/or other obstructions therefrom; to excavate, dredge, cut away, and remove any and all of said land and to place thereon dredge or spoil material; and for such other purposes as may be required in connection with said work of improvement; reserving, however, to the owners, their heirs and assigns, all such rights and privileges as may be used without interfering with or abridging the rights and easements hereby acquired; subject, however, to existing easements for public roads and highways, public utilities. Railroads and pipelines.*

As additional data is obtained and provided, and as more definite plans and specifications are developed; additional estates (in accordance with Chapter 12, ER 405- 1-12) may be determined to be appropriate. The determination of the required estates will be addressed in future documents applicable to the different components.

### **Non-Standard Estates**

There are currently no non-standard estates being proposed within this report

## **12. Attitude of Landowners**

Since no detailed site specific project boundaries have been identified, it is unknown at this time whether landowners support or oppose the projects.



### **13. Zoning Ordinances Proposed**

It is uncertain if zoning ordinances will be proposed for this project. This will be further investigated as each individual project is planned and developed.

### **14. Operations and Maintenance**

It is anticipated that the entities of the coast of Mississippi will assume complete responsibility for the operation of, maintenance of, repair of, and rehabilitation of, programs and projects recommended for implementation in this Interim Report. The issue of OMRR&R on potential projects to be analyzed under the long-term comprehensive plan of study will be more fully discussed when those measures are developed, and more data is available as to the nature of their potential OMRR&R and/or re-nourishment requirements.

### **15. Ability of Local Sponsor to Participate**

Catastrophic damages to the Mississippi coast have nearly eradicated the tax base to all three counties. If traditional Corps cost-sharing guidance were to be followed in the event of program and project implementation of the recommendations presented in this Interim Report, those components with hurricane storm damage or flood damage reduction benefits would normally be cost-shared on a 65% Federal/35% Non-Federal basis. Similarly, those components with ecosystem restoration ("fish and wildlife preservation") benefits would also be cost-shared on a 65% Federal/35% Non-Federal basis. Under consideration, current Administration policy on comprehensive multi-purpose programs of this nature, including the Comprehensive Everglades Restoration Programs, are cost shared 50 percent Federal, 50 percent non-Federal. Those limited benefits attributable to recreation in association with the above projects would traditionally be cost-shared on a 50% Federal/50% Non-Federal basis. The problems created by the storm damages are beyond local community's/government's capabilities to alleviate. Therefore, the State or other funding sources may be required to meet any cost share requirements.

### **16. Schedule of Land Acquisition Milestones**

The implementation of study documents will take place as each project is proposed. The time and cost to prepare Real Estate Plans, Real Estate Design Memorandums and Real Estate maps, as applicable, will vary depending on the size and nature of each proposed project. Upon approval of the implemented study document, real estate acquisition schedules would be variable and be based on the number of tracts involved, sponsor capabilities, and input by the individual project sponsors. As required, each respective Real Estate Plan or Real Estate Design Memorandum would provide a schedule of land acquisition milestones.

### **17. Facility or Utility Relocations**

Each project submitted for implementation approval will undergo an evaluation of facility or utility relocation. If applicable, a Preliminary Attorney's Opinion of Compensability will be prepared in accordance with ER 405-1-12 and included in the Real Estate Plan or Real Estate Design Memorandum, as applicable.

## **18. Minerals**

There are no known minerals in the project area.

## **19. Standing Timber and Vegetative Cover**

Standing timber or other vegetative cover of value has not been identified at this time. It will be identified in subsequent design documents.

## **20. Mitigation**

No mitigation is required if any of the near term recommendations are implemented. .

## **21. Outstanding Rights**

Outstanding rights will be identified in subsequent design documents.

## **22. Hazardous, Toxic and Radioactive Wastes (HTRW)**

Site inspections are currently being conducted by the U. S. Army Corps of Engineers, Mobile District, Environmental and Hazardous and Toxic Waste and Support Section, at and adjacent to the various proposed Coastal Mississippi Projects. These assessments are being conducted per the requirements of Engineer Regulation (ER) 1165-2-132 entitled, Hazardous, Toxic, and Radioactive Waste (HTRW) Guidance for Civil Works Projects, and the American Society of Testing and Materials Standard E 1527.

Inspections are being conducted to determine the presence or evidence of landfills, surface areas unable to support vegetation, visible sheens of petroleum product, nearby contaminated industrial facilities, or any type of visible indication that HTRW concerns exist that may impact the proposed projects.

Site inspections of adjacent properties, reviews of historic aerial photographs, and on site interviews are also being conducted to determine if HTRW concerns impact any of the proposed project areas. Additionally, environmental database record searches are being conducted to determine if they reveal any evidence of HTRW concerns within or adjacent to the areas of the proposed projects.

Based on the findings of the HTRW site assessment, any specific or unusual environmental concerns that are identified that would affect the construction of the proposed project will need to be addressed prior to acquisition.

## **23. Relocations of Roads, Bridges, Utilities/Facilities, Towns and Cemeteries**

Based on available information, required relocations of roads, bridges, utilities, towns or cemeteries could not be identified. These will be accomplished in subsequent design documents.

## **24. Recommendations:**

This report has been prepared in accordance with Chapter 12 of the Corps of Engineers Regulation ER 405-1-12. It is recommended that this report be approved for this phase of the study and that a more comprehensive cost analysis and report on the real estate requirements be prepared prior to the final report.