



Draft Environmental Assessment

City of Spanish Fort, Alabama Bluff Stabilization Project

August 10, 2006

FEMA PDM-PJ-04-AL-2003-006



FEMA

**U.S. Department of Homeland Security
Federal Emergency Management Agency
Region IV
3003 Chamblee Tucker Road
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LIST OF ACRONYMS AND ABBREVIATIONS

ACM	Asbestos-Containing Material
ADEM	Alabama Department of Environmental Management
ADWFF	Alabama Division of Wildlife and Freshwater Fisheries
AEMA	Alabama Emergency Management Agency
AHC	Alabama Historical Commission
ALDOT	Alabama Department of Transportation
APE	Area of Potential Effect
ASTM	American Society for Testing and Materials
AST	Aboveground Storage Tank
BMP	Best Management Practice
CAA	Clean Air Act
CATEX	Categorical Exclusion
CBMPP	Construction Best Management Practices Plan
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CWA	Clean Water Act
EA	Environmental Assessment
EDR	Environmental Data Resources, Inc.
EFH	Essential Fish Habitat
EHP	Environmental and Historic Preservation
EO	Presidential Executive Order
EPA	Environmental Protection Agency
ESA	Environmental Site Assessment
FEMA	Federal Emergency Management Agency
FINDS	Facility Index System
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
FWCA	Fish and Wildlife Coordination Act
Hwy	U.S. Highway
LBP	Lead-Based Paint
LUSTs	Leaking Underground Storage Tanks
MBTA	Migratory Bird Treaty Act
msl	Mean Sea Level
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places

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PDM	Pre-Disaster Mitigation
RCRA	Resource Conservation and Recovery Act
SHPO	State Historic Preservation Office
T&E	Threatened and Endangered
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	Underground Storage Tank

1.0 INTRODUCTION

The Federal Emergency Management Agency (FEMA) prepared this Environmental Assessment (EA) to address the City of Spanish Fort, Alabama, and its proposed Spanish Fort Bluff Stabilization Project, which would be partly funded by a FEMA Pre-Disaster Mitigation (PDM) grant. The PDM Program was authorized by §203 of the Robert T. Stafford Disaster Assistance and Emergency Relief Act (Stafford Act), 42 U.S. Code (USC). Program funding is provided through the National Pre-Disaster Mitigation Fund to assist States and local governments (including Indian Tribal governments) in implementing cost-effective hazard mitigation activities that complement a comprehensive mitigation program. The City of Spanish Fort, as the “sub-grantee” through the Alabama Emergency Management Agency (AEMA, the “grantee”), would be the recipient of PDM grant funds for the proposed project, if FEMA approves funding.

This EA has been prepared in accordance with the requirements and provisions of the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] Parts 1500 to 1508), and current FEMA regulations for NEPA environmental compliance (44 CFR Part 10).

This EA also has been prepared to address other, related environmental and historic preservation laws, regulations, and executive orders. CEQ regulations specifically state that NEPA requirements, “must be integrated with other planning and environmental review procedures required by law so that all such procedures run concurrently” (40 CFR 1500.2(c)). These include the Fish and Wildlife Coordination Act (16 USC 661); the Clean Water Act (33 USC 1251); the National Historic Preservation Act (16 USC 470); the Endangered Species Act (16 USC 1531); the Resource Conservation and Recovery Act of 1976; the Comprehensive Environmental Response, Compensation, and Liability Act of 1980; the Superfund Amendments and Reauthorization Act of 1986; the Farmland Protection Policy Act (Public Law 97-98, Sec. 1539-1549; 7 USC 4201 et. seq.); Presidential Executive Order (EO) 11988 (Floodplain Management), EO 11990, (Wetland Protection), and EO 12898 (Environmental Justice); among others.

The City of Spanish Fort and FEMA have contacted and consulted numerous state and federal regulatory agencies and requested their input regarding various aspects of the proposed project. Copies of relevant agency correspondence are in Appendix B.

The project area is located in a neighborhood of the City of Spanish Fort, in Baldwin County, Alabama (Figure 1). The project site is next to U.S. Highway (Hwy) 98, just east of the North Fork of D’Olive Creek, and overlooking Mobile Bay (Figure 2). The project would stabilize a bluff rising up from Hwy 98, thus protecting residences at the top of the bluff that are directly threatened by its subsidence. The bluff is bounded by undeveloped land to the north and south, by residential areas to the east, and by Hwy 98 to the west.

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INSERT FIGURE 1

INSERT FIGURE 2

2.0 PURPOSE AND NEED FOR ACTION

The purpose of the Spanish Fort Bluff Stabilization Project is to reduce the erosion of the bluff from water runoff and mass movements, as the erosion threatens 14 residential structures in the Old Spanish Fort Estates subdivision at the top of the bluff. Property values for the 14 affected residences were estimated in 2003 at between \$2,790,000 (2003 Baldwin County appraised value) and \$3,130,420 (2003 insured dwelling value) (City of Spanish Fort, 2003); the lack of bluff stabilization keeps these properties at risk due to bluff erosion, slumping, and landslide. The proposed action is needed to reduce future property damages and nearby road closures associated with erosion, slumping, and landslides.

Stormwater runoff for most the Old Spanish Fort Estates subdivision now flows to the west and eventually flows over the existing bluff face, down to Hwy 98's east roadway ditch (**Figure 2** and **Figure 3**). The water then flows through three cross drains under Hwy 98 and is discharged into the Mobile Bay wetlands to the west of the highway. Surface erosion of the unvegetated bluff face is a continuing problem during normal rainfall events. Due to the magnitude of this problem, the Alabama Department of Transportation (ALDOT) removes silt deposition from the east roadway ditch and the cross drains under the highway. Significant silt has also been carried by the stormwater runoff and deposited into the wetlands on the west side of the highway.

Although the Spanish Fort bluffs have been naturally eroding for centuries, over the last several years manmade changes and natural events have accelerated the erosion and caused large mudslides onto Hwy 98. The erosion has been accelerated by human alterations to the land, such as building houses on top of the bluff, installing septic systems on top of the bluff, clearing trees from the bluffs, and widening Hwy 98 in the late 1970s, which cut into the bluff. Recent natural occurrences have exacerbated the erosion. Natural events that have caused serious damage to the bluff include Hurricane Danny in 1997, Hurricane George in 1998, tropical storm rains in 1999, 2000, 2001, and 2003. During Hurricane Danny, 100 feet of the bluff was lost, causing a landslide that shut down Hwy 98 for several weeks. Another 100 feet of the bluff sloughed off during Hurricane George, requiring the highway to be closed (City of Spanish Fort, 2003).

Photographs in **Appendix C** show the bluff conditions and other relevant site features.

INSERT FIGURE 3

3.0 DESCRIPTION OF ALTERNATIVES

This section describes the project alternatives that were evaluated in the NEPA process, and summarizes the potential environmental effects of each alternative.

3.1 CONSIDERATION OF ALTERNATIVES

Alternatives to the proposed Spanish Fort bluff stabilization project were considered based on feasibility at the conceptual level and level of erosion control offered. The alternatives are the “No Action Alternative,” the “Buyout Alternative,” and the “Proposed Action Alternative—Bluff Stabilization Project.”

3.1.1 NO ACTION ALTERNATIVE

Under the No Action Alternative, no action would occur. The bluff would not be stabilized and extensive bluff erosion, slumping, and landslides would continue. With this, stability of several homes on the Spanish Fort bluff would be compromised, and those in imminent danger would be subject to possible future landslides, destroying the homes. Furthermore, homeowners and the public traveling on the highway below the bluff would be endangered by future large-scale storm events. If a large landslide occurred, Hwy 98, a major hurricane evacuation route, could be blocked, potentially resulting in serious and unacceptable public safety risks.

Deferring bluff stabilization to a later date would increase its cost. If no bluff stabilization occurred and residents had to be relocated or evacuated, the City of Spanish Fort could lose some tax revenues, and emergency response expenses would be incurred.

In addition, continued bluff erosion, slumping, and landslides could destroy historic gunnery mounds on the bluff and fill wetlands at the bottom of the bluff.

3.1.2 BUYOUT ALTERNATIVE

The most feasible alternative is a mitigation buyout of properties in the subject area and a relocation of the residents, referred to herein as the “Buyout Alternative.” Any homes purchased under this alternative would be demolished, and the land would be converted to permanent open space. No construction or bluff stabilization would occur.

Based on the City’s PDM application, the local residents are not receptive to this alternative. Some of the residents that would be affected have lived at this location on the bluff for over 30 years. While the alternative would include relocation of the bluff residents under imminent danger, the serious threat bluff erosion, slumping, and landslides would remain. Over the years, as the bluff continued to erode and slide away, other residents would be in danger of the effects of erosion and landslides, and then they would also need to be relocated elsewhere.

Without remedying the cause of bluff erosion, slumping, and landslides, the public traveling below on Hwy 98 would be endangered, and those continuing to reside on the bluff would eventually be in greater harm’s way. In addition, Hwy 98, a major hurricane evacuation route, could be blocked by a landslide.

This action alternative would cost more money than the Proposed Action Alternative due to the relocation and purchasing of residents' homes. The Proposed Action Alternative for bluff stabilization is estimated to cost \$2.8 million, whereas the buyout alternative is estimated to cost at least \$3 million, for the purchase of 14 properties that are most directly affected by the bluff subsidence. This figure is an estimate derived from the sum of the 2003 Property Assessments for the 14 properties (\$2,790,000), which are generally lower than fair market value and the insured dwelling value for the properties (\$3,130,420) (City of Spanish Fort, 2003).

If the City of Spanish Fort selects the Buyout Alternative for implementation, Spanish Fort would need to obtain all applicable permits regarding the handling and disposal of potentially toxic materials, e.g., asbestos-containing materials (ACMs) and lead-based paint (LBP), and also a National Pollutant Discharge Elimination System (NPDES) permit for stormwater discharges into "waters of the U.S."

3.1.3 PROPOSED ACTION ALTERNATIVE – BLUFF STABILIZATION PROJECT

The Proposed Action Alternative is construction of a bluff stabilization project. The project would encompass a 245-foot span of bluff reaching a vertical distance of about 100 feet, and the construction of four stabilization benches (berms) as shown in the Preliminary Design Plans (**Appendix D**). Each bench would be designed using internal geosynthetic reinforcing to achieve the required global stability factor of safety; grass and/or native vegetation would be planted on the bench tops. An extensive subsurface drainage system to control hydrostatic pressures beneath and behind the stability benches would also be installed. The geosynthetic reinforcing would not experience any significant loss of in-service tensile capacity for a period of 75 to 125 years and, therefore, the projected life of the proposed bluff stabilization should exceed this period under typical climatic conditions (Mattox, 2004).

The proposed Spanish Fort Bluff Stabilization Project would redirect stormwater runoff and thereby reduce bluff erosion, slumping, and landslides. The proposed design includes collection of the subdivision stormwater runoff at two drop inlets located at the top of the uppermost stability bench. The stormwater would then be carried by pipes down the bluff to the toe of the lowest stability bench, where it would be discharged into the east highway ditch, which would be armored to prevent erosion. From the roadway ditch, water would flow through existing cross drains under Hwy 98 into the wetlands to the west (Mattox, 2004).

Several permits would be obtained before implementing the Proposed Action Alternative; these are the responsibility of the City of Spanish Fort. A NPDES permit for stormwater discharge is required by the U.S. Environmental Protection Agency (EPA) and by the Alabama Department of Environmental Management (ADEM). Due to the presence of wetlands along the east roadway ditch at the bottom of the bluff, documentation to request coverage under a Nationwide Permit 33—Temporary Construction, Access, and Dewatering, was sent to the U.S. Army Corps of Engineers (USACE)—Mobile District (Ladner, 2006). **Table 1** summarizes the required permits and **Table 2** summarizes additional project-specific commitments associated with the Proposed Action Alternative.

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**Table 1
Permits Required Under the Proposed Action Alternative**

Agency	Required Permit	Reason for Permit	Commitment
EPA and ADEM (Admin. Code Ch. 335-6-12)	Register and maintain valid NPDES coverage for stormwater discharges.	<p>Project construction area would be greater than 1 acre.</p> <p>The City of Spanish Fort is required to register for, and maintain, valid NPDES coverage for stormwater discharges, prior to beginning construction or regulated land disturbance that will equal or exceed 1 acre in size.</p>	<p>The City of Spanish Fort or its designee will obtain the applicable NPDES permit prior to groundbreaking. In addition, the City of Spanish Fort will ensure that a Construction Best Management Practices Plan (CBMPP) is prepared by a qualified, credentialed professional to reduce pollutant discharges at the maximum extent practicable, as outlined in the <i>Alabama Handbook for Erosion Control, Sediment Control, and Stormwater Management On Construction Sites And Urban Areas</i>, per ADEM Admin. Code Ch. 335-6-12.</p>
USACE-Mobile District ADEM	<p>Nationwide Permit 33—Temporary Construction, Access, and Dewatering—for USACE and ADEM requirements regarding wetlands impacts, Proposed Activities in the waters of the United States, and potential coastal zone impacts.</p>	<p>Impact on jurisdictional wetlands during construction.</p> <p>The project is above the continuous 10-foot contour (Coastal), but impacts may affect coastal zone area and will affect wetlands.</p>	<p>All conditions of Nationwide Permit 33, as approved for use by USACE on June 1, 2006 for the project, will be followed by the City of Spanish Fort, including:</p> <ul style="list-style-type: none"> • Standard erosion control; • Allow area to revegetate; replanting would be required if area does not revegetate within 1 year of project completion; • Restoration of pre-project contours; and • Construction to be completed by 3/17/07. <p>In addition, the City of Spanish Fort must promptly notify the District Engineer, in writing, at the commencement and completion of the work.</p> <p>The Notice of Authorization, as provided by USACE in their letter dated June 1, 2006, must be posted at the site during construction of the permitted activity.</p> <p>If the scope of work or project location changes, the City of Spanish Fort will contact USACE for a verification of the wetland determination.</p>

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**Table 2
Other BMPs/Project Commitments
Associated with the Proposed Action Alternative**

RESOURCE AREA	BMPs/PROJECT COMMITMENTS
<i>Geology and Soils</i>	The City of Spanish Fort will implement the appropriate Construction Best Management Practices Plan (CBMPP) and an erosion control plan during construction to reduce the adverse effects from soil erosion during construction.
<i>Groundwater</i>	N/A
<i>Surface Water / Coastal Zone</i>	The City of Spanish Fort will implement the appropriate CBMPP and an erosion control plan during construction to reduce the adverse effects to surface water during construction.
<i>Stormwater</i>	See Table 1 for EPA and ADEM NPDES permit requirements.
<i>Floodplain Management</i>	N/A
<i>Wetlands</i>	See Table 1 for USACE Nationwide Permit 33 requirements.
<i>Biological Resources</i>	In accordance with an e-mail request by Alabama Division of Wildlife and Freshwater Fisheries (ADWFF) for compliance with the Migratory Bird Act (MBTA), inspect, prior to removal, all large trees during construction for raptor and/or migratory bird nests. These trees will not be removed until the fledglings have left the nest.
<i>Cultural Resources</i>	Establish and maintain a 10-foot (3-meter) buffer zone around the perimeter of Earthwork 1, encompassing the bulwark at this site, to protect the site from impacts during construction. Establish and maintain a 10-foot (3 meter) buffer zone around the northern and western perimeters of Earthwork 2, with a larger area encompassed in the center of the buffer zone. If avoidance of the two earthworks is not possible, the City of Spanish Fort will conduct a Phase II evaluation and documentation, as required by the Alabama State Historic Preservation Office. The Phase II will include thorough photodocumentation and mapping, as well as a detailed history, for each resource that cannot be avoided, with specific project details determined through further consultation with the Alabama State Historic Preservation Office.
<i>Land Use and Visual Resources</i>	N/A
<i>Noise and Air Quality</i>	Maintain construction vehicles and equipment used for this project in good working order to minimize noise and pollutant emissions during project work.

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RESOURCE AREA	BMPs/PROJECT COMMITMENTS
<i>Socioeconomics and Environmental Justice</i>	N/A
<i>Hazardous Waste and Materials</i>	Establish BMPs that include provisions for control and cleanup of accidental spills during construction. Maintain construction equipment in good working order.
<i>Cumulative Impacts</i>	N/A

3.2 COMPARISON OF POTENTIAL EFFECTS

Section 4.0 describes the existing environment and presents the evaluation of potential impacts related to the No Action Alternative and the two action alternatives. A summary of the potential effects of each alternative is presented in Table 3.

**Table 3
Comparison of Potential Effects of Alternatives on Resource Areas**

RESOURCE AREA	POTENTIAL EFFECTS		
	No Action Alternative	Buyout Alternative	Proposed Action Alternative
<i>Geology and Soils</i>	No impact on geology. Continued soil erosion, slumping, and landslides.	No impact on geology. Continued soil erosion, slumping, and landslides. Soil disturbance in areas of structures by demolition activities, and potential erosion until vegetation has stabilized the soils.	No impact on geology. Soil erosion, slumping, and landslides would be greatly reduced. BMPs would be used during construction to reduce sediment in stormwater runoff.
<i>Groundwater</i>	No change to the impact on groundwater. Continued seepage of sanitary wastewater from residential septic systems.	Beneficial impact on groundwater due to removal of septic systems of acquired homes.	Continued seepage of sanitary wastewater from residential septic systems. Control of groundwater seepage and discharge at bottom of the bluff.

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RESOURCE AREA	POTENTIAL EFFECTS		
	No Action Alternative	Buyout Alternative	Proposed Action Alternative
<i>Surface Water / Coastal Zone</i>	<p>Sedimentation of the North Fork of D'Olive Creek would continue and potentially worsen.</p> <p>No construction would occur within the Coastal Zone Management Area.</p>	<p>Sedimentation of the North Fork of D'Olive Creek would continue and potentially worsen.</p> <p>No construction would occur within the Coastal Zone Management Area.</p>	<p>Future sedimentation of the North Fork from this area of the bluff would be greatly reduced.</p> <p>Construction would not likely occur within the Coastal Zone Management Area. However some temporary impacts from construction could adversely affect the coastal zone.</p>
<i>Stormwater</i>	<p>Stormwater runoff on the bluff would not be controlled.</p> <p>Sedimentation of the North Fork due to bluff erosion, slumping, and landslides would continue</p>	<p>Stormwater runoff on the bluff would not be controlled.</p> <p>Sedimentation of the North Fork due to bluff erosion and slumping would continue.,</p> <p>BMPs and an erosion control plan would be implemented during demolition to reduce erosion and sedimentation from the project.</p>	<p>During construction, BMPs and an erosion control plan would be implemented to reduce erosion and sedimentation from the project.</p> <p>Upon project completion, stormwater runoff would be controlled, and the ongoing bluff erosion, slumping, and landslides would be mitigated, thus reducing future sedimentation of the North Fork.</p>
<i>Floodplain Management</i>	<p>No impact to the floodplain within the project site.</p> <p>Future bluff slumping and landslides could add fill to the floodplain at the bottom of the bluff.</p>	<p>No direct impact to the floodplain within the project site.</p> <p>Future bluff slumping and landslides could add fill to the floodplain at the bottom of the bluff.</p>	<p>Involves construction within the floodplain.</p> <p>No increased discharge rate of stormwater into the floodplain during construction or from the completed project; would not significantly decrease floodplain storage capacity.</p>

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RESOURCE AREA	POTENTIAL EFFECTS		
	No Action Alternative	Buyout Alternative	Proposed Action Alternative
<i>Wetlands</i>	<p>No direct impact on wetlands.</p> <p>Continued bluff slumping and landslides would eventually fill wetlands at the bottom of the bluff.</p>	<p>No direct impact on wetlands from the project.</p> <p>Continued bluff slumping and landslides would eventually fill wetlands at the bottom of the bluff.</p>	<p>During construction, part of the wetlands would be disturbed and degraded. Wetlands will be restored post-construction in accordance with Nationwide Permit 33 conditions.</p> <p>Completed project would reduce sedimentation in the wetlands.</p>
<i>Biological Resources</i>	<p>No direct impacts to biological resources.</p> <p>Continued bluff erosion, slumping, and landslides, depleting mature vegetation and resulting in continued sedimentation in wetlands and nearshore waters.</p>	<p>Continued bluff erosion, slumping, and land slides, depleting mature vegetation and resulting in continued sedimentation in wetlands and nearshore waters.</p> <p>Removal of landscaping adjacent to project area structures and replacement with grass and/or native vegetation, potentially changing the habitat species composition.</p>	<p>Greatly reduced bluff erosion, slumping, and landslides, decreasing negative impacts of erosion and sedimentation of surrounding habitat.</p> <p>Removal of existing vegetation on the bluff, including mature trees, and replacement with grass on the stability benches, potentially changing habitat species composition.</p>
<i>Cultural Resources</i>	<p>No protection of two National Register-eligible sites from bluff erosion and slumping.</p> <p>One site is in imminent danger of being destroyed by bluff erosion, slumping, and landslides.</p> <p>Potential future destruction of the second site due to continued bluff erosion and slumping.</p>	<p>No protection of two National Register-eligible sites from bluff erosion, slumping, and landslides.</p> <p>One site is in imminent danger of being destroyed by bluff erosion, slumping, and landslides.</p> <p>Potential future destruction of the second site due to continued bluff erosion, slumping, and landslides.</p>	<p>Protection of two National Register-eligible sites from future bluff erosion, slumping, and landslides.</p> <p>Placement of a buffer during construction around the first site at the bluff edge and where in imminent danger of being destroyed by bluff erosion, slumping, and landslides.</p> <p>No impact to the second site.</p>

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RESOURCE AREA	POTENTIAL EFFECTS		
	No Action Alternative	Buyout Alternative	Proposed Action Alternative
<i>Land Use and Visual Resources</i>	<p>No impact on land use or visual resources.</p> <p>Continued bluff erosion, slumping, and landslides; periodically, trees and manmade drainage structures would slide down the bluff.</p>	<p>Project area land use would change from residential to permanent open space. Visual resources of the residential area would change to open space, but not the bluff's visual resources.</p> <p>Temporary adverse impacts on visual resources during demolition of the residences.</p>	<p>No land use change.</p> <p>Bluff visuals would change from that of the untamed, natural landscape of the bluff (trees and debris) to grassy terraces.</p> <p>Temporary impacts to the wetlands area along the roadway ditch, which will be restored post-construction.</p>
<i>Noise and Air Quality</i>	No impacts on noise or air quality.	Temporary impacts on noise and air quality from demolition equipment.	Temporary impacts on noise and air quality from construction equipment.
<i>Socioeconomics and Environmental Justice</i>	No impacts on low-income or minority populations.	No impacts on low-income or minority populations.	No impacts on low-income or minority populations.
<i>Hazardous Waste and Materials</i>	No impacts on of from hazardous waste or materials.	<p>During the demolition phase, toxic building materials such as ACM and LBP could be handled and disposed; these will be managed in accordance with all applicable regulations.</p> <p>Vehicle and equipment fuels and lubricants would also be used onsite during demolition; BMPs will be implemented to control these materials.</p>	Not expected to have any adverse impact on hazardous waste and materials. Hazardous materials (vehicle and equipment fuels and lubricants) would be used onsite during construction; BMPs will be implemented to control these materials.

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RESOURCE AREA	POTENTIAL EFFECTS		
	No Action Alternative	Buyout Alternative	Proposed Action Alternative
<i>Cumulative Impacts</i>	<p>Adjacent areas of the bluff could become destabilized and erosion, slumping, and landslides could be exacerbated. This would result in danger to the public, additional sedimentation, filling of wetlands, in-fill of the 100-year floodplain, destruction of cultural resources, and decreased property values and City tax revenues.</p> <p>Cumulative impacts of the No Action Alternative and the other development planned in the site vicinity would occur to wetlands.</p>	<p>Adjacent areas of the bluff could become destabilized and erosion, slumping, and landslides could be exacerbated. This would result in danger to the public, additional sedimentation, filling of wetlands, in-fill of the 100-year floodplain, destruction of cultural resources, and decreased property values and City tax revenues.</p> <p>Cumulative impacts of the Buyout Alternative and the other development planned in the site vicinity would occur to wetlands.</p>	<p>No cumulative adverse effects would occur, as wetlands that are adversely impacted during project construction would be restored as part of the project.</p>

None of the alternatives are expected to result in significant adverse impacts. Most of the potential impacts are minor, and do not require mitigation, or will be reduced through implementation of BMPs and the permit requirements (e.g., the USACE Nationwide Permit needed for the Proposed Action Alternative requires wetlands restoration). No compensatory mitigation is required of any of the alternatives.

Neither the Buyout Alternative nor the No Action Alternative address the ongoing bluff erosion, slumping, and landslides, which is reducing bluff habitat; contributing to sedimentation of the wetlands, creeks, and marshes along Mobile Bay; and posing an imminent threat to one Civil War gunnery mound at the top of the bluff and an eventual threat to the other. In addition, these two alternatives do not address the risk of landslide and blockage of Hwy 98, a major hurricane evacuation route.

The Proposed Action Alternative is not expected to result in significant adverse impacts. The City of Spanish Fort passed a resolution to avoid any construction impacts to the gunnery mound in imminent threat of collapse (see **Section 4.6**). In addition, the City of Spanish Fort will restore the wetlands along the roadside ditch post-construction in accordance with USACE Nationwide Permit conditions of the. The largest long-term impacts will be the removal of trees on the

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bluff's slope. **Section 4.11** describes the mitigation actions necessary to minimize unavoidable adverse impacts.

4.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section describes the affected (existing) environment of the project area and then describes the potential environmental consequences due to implementation of the alternatives—No Action Alternative, the Buyout Alternative, and the Proposed Action Alternative.

The potential effects on physical, natural, and socioeconomic resources within the project area that are discussed in this document include direct, indirect, and cumulative effects.

4.1 GEOLOGY AND SOILS

Affected Environment

The project area is located within both the Alluvial-deltaic district and the Southern Pines Hills district of the East Gulf Coastal Plain physiographic region. Elevation of the project area ranges from about 12 to 100 feet above mean sea level (msl). The geologic formation underlying the project area is Hattiesburg clay, which consists of white, pink, or purple thin-bedded to massive fine to coarse sand; gravelly sand; thin-bedded to massive clay; and sandy clay that is exposed along area streams (Smith, 1988; McBride and Burgess, 1964).

The *Soil Survey for Baldwin County, Alabama* (McBride and Burgess, 1964) describes three soil types for the survey area. Proceeding from the top of the bluff to the bottom, these include “Ruston fine sandy loam, 2 to 5 percent slopes,” found on uplands; “Bowie, Lakeland, and Cuthbert soils, 12 to 25 percent slopes,” eroded, found on steep, often wooded slopes that may contain small seep areas and outcrops of rock; and “Swamp,” found in frequently flooded areas that have standing water most of the year.

Volkert Environmental Group, Inc. conducted a Phase I Environmental Site Assessment (ESA) in 2000 on behalf of the City of Spanish Fort, to assess the potential for soil contamination within the project site. The site reconnaissance identified no issues of concern on the project site. No aboveground storage tanks (ASTs) or underground storage tanks (USTs) that could contain hazardous materials were identified at the time of the site visit, but most houses on the bluff were recorded as having septic systems. URS’ visual site inspection of the project area also found no ASTs, USTs, or objects/issues of concern that might have contaminated site soils.

Current and former operations on and topographically up-gradient of the project area do not appear to have resulted in onsite soil contamination, and affected soils are not known to be present within the Spanish Fort project site. However, several offsite facilities were identified that have the potential to contain adversely affected soils on these properties, based on the proximity of the sites to these properties and/or the reported releases of hazardous materials from these nearby facilities. The offsite facilities were identified through historical research, review of an Environmental Data Resources, Inc. (EDR) regulatory database report, and a visual reconnaissance of surrounding properties (Volkert, 2000). The offsite facilities of potential concern are all located at a lower elevation than that of the bluff project area, indicating that

groundwater would flow away from the subject property and toward Mobile Bay. This was confirmed by Larry Morris of the Baldwin County Natural Resources Conservation Service (NRCS) (Morris, 2005). Additional information is presented in **Appendix E**.

Based on studies completed by Volkert (2000), four layers comprise the bluff from top to bottom: a top layer of clayey sand, then a layer of sand, a layer of clay, and at the bottom, another layer of sand (**Appendix D** Pages 1 and 2). Bluff erosion of the topsoil is caused by uncontrolled stormwater flowing over the top of the cliff. In addition, rainwater infiltrates the top layer of clayey sand and collects in the underlying sand layer. This groundwater is blocked from further downward infiltration by the underlying impervious clay layer. Increased rainwater infiltration during a storm causes hydrostatic pressure to build up in the sand layer, where both water and sand are squeezed toward the bluff edge and the sand is forced out into slide debris. The resulting void in the sand layer causes the clayey sand layer above to collapse, resulting in subsidence (Griggs, 2005).

Several of the residents on the edge of the bluff have added fill soil to attempt to stop the sloughing and replace soils that have eroded/sloughed.

Environmental Consequences

No Action Alternative

The implementation of the No Action Alternative would not affect geologic resources as no construction would occur. Erosion of bluff soils due to stormwater runoff and bluff slumping would continue, as no stabilization efforts would be undertaken.

Buyout Alternative

The implementation of the Buyout Alternative would not affect geologic resources as demolition activities would not be deep enough to affect the underlying resources.

Soils at the top of the bluff that are exposed during demolition and removal of the residences would be subject to erosion until stabilized by newly installed vegetation; the impacts would not be significant due to implementation of appropriate BMPs and an erosion control plan. Erosion of bluff soils due to stormwater runoff and bluff slumping would continue to result in adverse impacts to soils and water quality, as no stabilization efforts would be undertaken.

Proposed Action Alternative – Bluff Stabilization Project

The implementation of the Proposed Action Alternative would not affect geologic resources as bluff stabilization activities would not be deep enough to affect the underlying resources.

Implementation of the Proposed Action Alternative would provide the most protection for the soils at the top of the bluff and on the bluff face. This alternative would control the stormwater runoff and bluff slumping by controlling the discharge rate of stormwater and directing groundwater in a controlled manner through the bluff. These actions would greatly reduce bluff erosion, slumping, and landslides. Appropriate BMPs and an erosion control plan will be implemented during construction to reduce the adverse effects from soil erosion.

4.2 WATER RESOURCES AND WATER QUALITY

4.2.1 Groundwater

Affected Environment

Groundwater in the area is widely used for drinking, irrigation, industrial, and other purposes (Chandler et al., 1985).

During the URS and Volkert site surveys, no groundwater issues or concerns were identified within the project site. As stated in **Section 4.1**, any offsite facilities and their materials of potential concern are located at lower elevations than the bluff, and, there are no artesian aquifers and there are no floating plumes involved. Therefore, they would not contaminate project site groundwater. Most residents within the Spanish Fort subdivision have septic systems; sanitary wastewater seeps out of the systems into the surrounding soils and potentially into the groundwater. Additional information is presented in **Appendix E**.

Rainwater infiltration into the top of the bluff is the source of the bluff's groundwater. Under non-storm conditions, groundwater infiltrates the underlying layers and flows out of the bluff through natural seeps. During storm conditions, the groundwater builds up in the top sandy layer and is squeezed toward the bluff face, which results in bluff slumping. These seeps are shown as natural springs in **Appendix D**, page 5 of Volkert's design plans.

Environmental Consequences

No Action Alternative

The No Action Alternative would not affect groundwater. Sanitary wastewater would continue to seep from the residential septic systems into groundwater.

Buyout Alternative

Under the Buyout Alternative, the septic systems of the acquired properties would be removed, so these existing adverse impacts on groundwater would be reduced. Rainwater would continue to infiltrate the bluff surface and flow out as groundwater from the side and at the bottom of the bluff.

Proposed Action Alternative – Bluff Stabilization Project

Under the Proposed Action Alternative, sanitary wastewater from the residences would continue to seep from the residential septic systems into groundwater. However, this adverse impact is not significant and would not be significant in the future under continued normal usage and maintenance of the septic systems.

Control of the groundwater flow from the bluff would be controlled by installing spring boxes in the layers of sand to collect excess groundwater and outfall in the terraced bench area. Controlling the groundwater flow from the bluff would reduce the negative impacts of excess groundwater on the bluff's structural integrity.

4.2.2 Surface Water and Coastal Zone

Affected Environment

The project area is located in the Mobile River Basin, which drains 44,000 square miles in Georgia, Tennessee, Alabama, and Mississippi. It comprises the Alabama and Tombigbee Rivers that meet to form the Mobile River. The Mobile River drains into Mobile Bay, which discharges into the Gulf of Mexico. The major land uses in this basin are forested land (69 percent), agricultural land (18 percent), urban land (2 percent), and other uses such as wetlands, lakes, reservoirs, and streams (11 percent) (U.S. Geological Survey [USGS], 2005). The area is characterized as coastal plain, and is underlain by sand and gravel aquifer systems, which are important sources of drinking water. This part of the Gulf of the Mexico coast is bordered along its shores by salt marshes characterized by the marsh grass *Spartina*.

The closest permanent water body to the project area is the North Fork of D'Olive Creek (**Figure 1**). The North Fork joins the main branch of D'Olive Creek south of the project site; D'Olive Creek then flows into D'Olive Bay. D'Olive Creek is classified suitable for Fish and Wildlife under ADEM's Water Use Classification for Interstate and Intrastate Waters, but not for recreational or public water supply purposes (adopted May 5, 1967, and last amended on May 27, 2004). As described below, D'Olive Creek is highly affected by sedimentation.

Another significant water resource in the immediate area is Bay Minette Creek, which flows into the Blakely River. Blakely River then flows past D'Olive Bay, located just below the bluff area of the site. The Blakely River and D'Olive Bay both flow into Mobile Bay. Bay Minette Creek is 16.6 miles long and primarily used for fish and wildlife purposes. Mercury was documented in the water in 2000 on the State's Section 303(d) of the Clean Water Act (CWA) list for impaired waters; the source of this pollutant is unknown (ADEM, 2002).

D'Olive Bay was previously part of the Mobile-Tensaw Delta, but was cut off 70 years ago when engineers built the causeway west of Spanish Fort. D'Olive Bay is now only fed by a weak D'Olive Creek, which has become filled with 2 to 3 feet of silt from development. The bay was previously characterized by great diversity and health, but the fish, shrimp, and grasses of the area are all gone. Between 1971 and 1974, 44,000 tons of dirt from the Lake Forest subdivision was allowed to flow into the bay each year. Some of this silt travels out of D'Olive Bay and into Mobile Bay. Under natural conditions, it would have taken 500 years to fill the bay with this much silt. Previously 5 feet deep, D'Olive Bay is now only 1 to 2 feet deep (Cusick, 1999).

One of the greatest impacts on the surface waters in the study area is the rapid population growth of Alabama's coastal counties. According to a 2004 report by ADEM, Baldwin County has had a 42.9 percent increase in population size from 1990 to 2000 (ADEM, 2004). This population increase supports an increase in land development, stormwater runoff, and sediment deposition into the surrounding water bodies. The project site contains manmade berms for retaining and channeling water, and drainage ditches.

Part of the project site is located within the coastal zone of Alabama, which, pursuant to the Coastal Zone Management Act, extends from the continuous 10-foot contour seaward, to the 3-mile limit. Program responsibilities are divided between two state departments. ADEM handles

all of the regulatory aspects of the program, including wetland and coastal construction permitting. The Alabama Department of Conservation and Natural Resources, State Lands Division, Coastal Section, is responsible for overall program management, including fiscal and grant management, planning, and public information. USACE under the nationwide permitting process will coordinate the coastal consistency requirement with state Coastal Section.

Environmental Consequences

No Action Alternative

Under the No Action Alternative, impacts on surface waters from erosion and sedimentation would continue to occur as they do at present.

Buyout Alternative

Under the Buyout Alternative, impacts on surface waters from erosion and sedimentation would continue to occur as they do at present. If implemented, the removal of existing structures and vegetation during demolition would temporarily result in increased runoff and eroded soils on the top of the bluff.

Proposed Action Alternative – Bluff Stabilization Project

The Proposed Action Alternative would reduce future erosion of the bluff itself and thereby reduce sedimentation of the North Fork of D'Olive Creek, by controlling the flow and location of stormwater and groundwater seepage runoff coming off the bluffs.

During construction of the Proposed Action Alternative, temporary impacts would occur to the coastal zone, as defined by the CZMA, as stormwater runoff from the construction zone may carry sedimentation into the adjacent marshes. Implementing the project-specific erosion control plan will minimize these impacts to insignificance. Impacts to wetlands and implementation of Nationwide Permit 33— Temporary Construction, Access, and Dewatering, will not significantly adversely affect the coastal zone.

4.2.3 Stormwater

Affected Environment

Under existing conditions, stormwater either infiltrates site soils or flows uncontrollably off the top of the bluff and down its side toward Hwy 98; berms have been constructed along some portions of the bluff top. Under these conditions, erosion of surface soils is taking place. In addition, the stormwater that soaks into the ground and flows down through the sandy layers of the bluff erodes them and continues the bluff slumping. The stormwater flowing down the slope is picking up both surface soils and debris slides from the bluff slumping. The project site does, however, contain berms for retaining and channeling water, and drainage ditches. According to Volkert, these measures were intended to control runoff on top of the bluff but appeared to be ineffective (Volkert, 2000).

Environmental Consequences

No Action Alternative

Under the No Action Alternative, stormwater runoff would not be affected. Due to the continued uncontrolled stormwater runoff, bluff erosion and subsequent sedimentation of D'Olive Creek and Mobile Bay would continue.

Buyout Alternative

Under the Buyout Alternative, bluff erosion and subsequent sedimentation of D'Olive Creek and Mobile Bay would continue.

Pursuant to CWA Section 402, any project involving construction must comply with EPA rules and ADEM Administrative Code Ch. 335-6-12, "the operator/owner or applicant is required to register for and maintain valid NPDES coverage for stormwater discharges prior to beginning construction or regulated land disturbance that will equal or exceed one (1) acre in size." The demolition of the 14 structures in the Buyout Alternative would affect an area over 1 acre and the City of Spanish Fort will acquire coverage under the appropriate NPDES permit.

ADEM requires preparation of a CBMPP by a qualified, credentialed professional to reduce pollutant discharges to the maximum extent practicable, as outlined in the *Alabama Handbook for Erosion Control, Sediment Control, and Stormwater Management On Construction Sites And Urban Areas* [ADEM Admin. Code Ch. 335-6-12] for all construction land-disturbance activities. The CBMPP for this project will meet these requirements. Therefore, if the Buyout Alternative were chosen, minimal impacts from stormwater would occur during demolition and removal, because a CBMPP will be prepared and followed, and include BMPs and an erosion control plan.

Proposed Action Alternative – Bluff Stabilization Project

Implementation of the Proposed Action Alternative would prevent uncontrolled stormwater runoff from flowing over the bluffs and control the amount of stormwater that seeps into the ground at the top of the bluff. The Proposed Action Alternative would also control the flow of groundwater in the top layer of sand in the bluff, and reduce the buildup of groundwater in this layer during a storm event, which leads to bluff slumping, another sediment source. This alternative would not change the amount of stormwater that ends up at the bottom of the bluff, but would control the location of stormwater flow, and reduce the discharge rate during storms. This would reduce bluff erosion, slumping, landslides, and sedimentation into the roadside ditch, nearby wetlands, and ultimately the North Fork of D'Olive Creek.

Pursuant to CWA Section 402, any project involving construction must comply with EPA rules and ADEM Administrative Code Ch. 335-6-12, "the operator/owner or applicant is required to register for and maintain valid NPDES coverage for stormwater discharges prior to beginning construction or regulated land disturbance that will equal or exceed one (1) acre in size." Implementation of the bluff stabilization project would affect an area over 1 acre and the City of Spanish Fort will acquire coverage under the appropriate NPDES permit.

The CBMPP for this project will be prepared in accordance with ADEM requirements. Therefore, if the Proposed Action Alternative were implemented, minimal impacts from stormwater would occur during demolition and removal, because a CBMPP will be prepared and followed, and include BMPs and an erosion control plan (Griggs and Livingston, 2005).

4.3 FLOODPLAIN MANAGEMENT

Affected Environment

Situated on a bluff, the Patrician Drive area of Spanish Fort is not in a FEMA-designated special flood hazard area. The area at the bottom of the bluffs next to Hwy 98 is within the FEMA-designated special flood hazard area, Zone AE (100-year floodplain with established flood elevation) (FEMA Federal Insurance Rate Map [FIRM] Panel 01003C0391K; **Figure 4**).

Environmental Consequences

Presidential Executive Order (EO) 11988 (Floodplain Management) requires federal agencies to avoid to the extent possible the long-term and short-term adverse impacts associated with floodplain occupancy and modification, and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative.

No Action Alternative

The No Action Alternative would not impact floodplains because no construction would occur. However, future bluff erosion, slumping, and landslides would result in sediment being deposited in the floodplain at the bottom of the bluff.

Buyout Alternative

The Buyout Alternative would not impact floodplains because no construction would occur within a floodplain. However, future bluff erosion, slumping, and landslides would result in sediment being deposited in the floodplain at the bottom of the bluff.

Proposed Action Alternative – Bluff Stabilization Project

Under the Proposed Action Alternative, the City of Spanish Fort would place fill soil at the bottom of the bluffs within the FEMA-designated special flood hazard area. The design components for the Spanish Fort Bluff Stabilization Project would provide adequate protection to ensure that there are no adverse impacts created in the downstream area as a result of this construction. As described in **Section 4.2.3**, the Proposed Action Alternative would not increase the stormwater flow into the outfall area at the bottom of the bluffs and would not cause significant adverse flood impacts downstream.

4.4 WETLANDS

Affected Environment

Pursuant to CWA Section 404, which regulates the discharge of dredged and fill material into “waters of the U.S.”, including wetlands, and EO 11990 (Wetland Protection), which requires federal agencies to avoid the adverse impacts associated with wetland destruction or modification, this EA describes the three project alternatives’ impacts on wetlands. USACE regulates jurisdictional waters under authority derived from CWA Section 404.

Portions of the project site exhibit typical wetland characteristics as described in the *U.S. Army Corps of Engineers’ 1987 Wetland Delineation Manual*. Hydrophytic vegetation, soils saturated within the upper 12 inches, soils exhibiting low chroma “colors”, and “reducing” conditions are present in areas parallel to and east of Hwy 98 near the bottom of the bluff, and on small benches along the bluff. The area is continually fed by seeps from the bluff and also conveys wet weather flows. These seeps are reported to be contributing to the bluff instability problem.

In August 2005, URS conducted an assessment of the project site for jurisdictional “waters of the U.S.” The assessment began with review of U.S. Geological Survey topographic maps, National Wetland Inventory maps, and county soil survey maps. A wetland biologist then performed field visits to verify and refine the delineations using the *U.S. Army Corps of Engineers’ 1987 Wetland Delineation Manual*.

The field visits followed the USACE multi-parameter approach, which requires positive evidence of three criteria: hydrophytic vegetation, hydric soil, and wetland hydrology. Areas were considered wetlands if they exhibited evidence of all three of the wetland parameters. A low-medium-high rating system was used to evaluate the wetland sites in terms of their ability to perform their associated functions. Factors considered included type of habitat, (i.e., forested, emergent, etc.) vegetation diversity, hydrology, size, surrounding landscape, wildlife habitat, wildlife corridors, and size/type of stream course.

Water was observed both flowing (near drainage pipes) and pooling (microswales) in the Hwy 98 roadside drainage ditch at the bottom of the bluff. Three drainage pipes, intended to drain this area, extend from the bluff base, under Hwy 98, and empty into the wetland area on the west side of the highway. Water drains along the wetland area/ditch from both directions into the three drainage pipes), and tallowtree (*Sapium sebiferum*). URS also conducted representative plot samples to document soil conditions and vegetation, and completed routine wetland determination data forms from the *U.S. Army Corps of Engineers’ 1987 Wetland Delineation Manual*. The area was considered to be low quality due to sedimentation, small size relative to nearby wetlands, maintenance as a roadside ditch, proximity to a busy highway, and existing drainage structures intended to drain the area. A wetland boundary was identified and flagged in the field, and, based on URS’ delineation and subsequent survey, the wetland area is about 0.33 acre in size.

Based on this investigation, the roadside ditch described meets the wetland criteria for jurisdictional waters of the U.S. as outlined in 33 CFR Section 328.3(a)(3), but appears to be a very low-quality area. USACE confirmed that this area met the basic criteria for a jurisdictional

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determination. The wetland area was surveyed, and 0.33 acre lies within the proposed construction limits of the subject site.

Environmental Consequences

No Action Alternative

Under the No Action Alternative, no construction would occur in the project area. However, this alternative would not address the bluff erosion and resulting surface water sedimentation problems, and these adverse impacts on wetlands would continue to occur.

Buyout Alternative

The Buyout Alternative would entail demolition of the residential structures on top of the bluff, but BMPs will be implemented to reduce/eliminate impact to the wetlands at the bottom of the bluff during this activity. Since this alternative would not address the bluff erosion and resulting surface water sedimentation problems, these adverse impacts on wetlands would continue to occur.

Proposed Action Alternative – Bluff Stabilization Project

USACE approved the project under Nationwide Permit 33—Temporary Construction, Access, and Dewatering, on June 1, 2006 (**Appendix B**). In addition to standard erosion-control measures, the permit stipulates the area must be returned to its original contours and allowed to revegetate. Replanting of the area will be required, should the area not revegetate within 1 year of project completion. Also, the City of Spanish Fort will promptly contact the District Engineer in writing regarding the commencement and completion of the work. Furthermore, the Notice of Authorization, provided in the June 1, 2006 USACE letter, will be posted at the site during construction of the permitted activity.

Design components of the Proposed Action Alternative will provide adequate protection to ensure that no notable adverse impacts occur in the downstream area as a result of construction. The proposed design would greatly reduce the sedimentation in the east roadway ditch of Hwy 98, and in the higher-quality wetlands on the west side of the highway. The Proposed Action Alternative would be beneficial to wetlands, because it would not increase flow or change the amount of discharge to the wetlands area, and it would improve the water quality by reducing erosion and sedimentation.

4.5 BIOLOGICAL RESOURCES

Affected Environment

Flora

The project area lies within the Southern Mixed Forest, which begins at about the latitude of Clark and Monroe counties and continues south into Florida. In Baldwin County, this forest type extends to the Gulf Coast. In sandy areas near the coast, the forest consists mostly of pines, and is sometimes referred to as a pine-oak savanna (Thomas, 1973). Old growth vegetation is

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provided by medium-tall to tall forests of broadleaf deciduous and needleleaf evergreen trees. At least 50 percent of the stands are made up of loblolly pine (*Pinus taeda*), shortleaf pine (*Pinus echinata*), and other southern yellow pine species (*Pinus palustris*), singly or in combination. Common associates include oaks (*Quercus falcata*, *Q. stellata*, *Q. laevis*), hickory (*Carya* sp.), sweetgum (*Liquidambar styraciflua*), blackgum (*Nyssa sylvatica*), red maple (*Acer rubrum*), and winged elm (*Ulmus alata*). The main grasses are bluestem (*Schizachyrium scoparium*), panicums (*Panicum* sp.), and longleaf uniola (*Chasmanthium sessiliflorum*). Dogwood (*Cornus florida*), viburnum (*Viburnum* sp.), haw (*Crataegus* sp.), blueberry (*Vaccinium* sp.), American beautyberry (*Callicarpa americana*), youpon (*Ilex vomitoria*), and numerous woody vines are common. The west Gulf Coast is bordered along its shores by salt marshes characterized by the marsh grass *Spartina* (*Spartina* sp.).

Vegetation both on and above the bluff is consistent with what would be expected in a residential setting of this age. Although mature vegetation is present, no significant wildlife habitat or resources are present. Mature pines (primarily loblolly) and oaks are interspersed throughout the residential area. Other species include sweetbay (*Magnolia virginiana*), sweetgum, tulip poplar (*Liriodendron tulipifera*), crepe myrtle (*Lagerstroemia indica*), holly (*Ilex* sp.), and azalea (*Rhododendron* sp.). Due to bluff slumping, its areas of mature vegetation are being depleted.

The bluff itself consists of a relatively mature canopy of the same tree species listed above, but includes a variety of other vegetation consisting of alder, cane, wax myrtle, and small amounts of netted chain fern. Due to the ongoing bluff erosion, slumping, and landslides, trees and vegetation on the slope and at the bluff's edge have fallen over and continue to fall over and slide down the slope (**Appendix C Photographs**).

Fauna

In the Southern Mixed Forests, fauna vary with the age and stocking of timber stands, percent of deciduous trees, proximity to openings, and presence of bottom-land forest types. Whitetail deer (*Odocoileus virginianus*) and cottontail rabbits (*Sylvilagus* sp.) are widespread. When deciduous trees are present on uplands, the fox squirrel (*Sciurus niger*) is common. Gray squirrels (*Sciurus carolinensis*) live along intersecting drainages. Raccoon (*Procyon lotor*) and fox species inhabit the whole region and are hunted in many areas. Among mammals frequently found in this area is the nine-banded armadillo (*Dasypus novemcinctus*).

The eastern wild turkey (*Meleagris gallopavo silvestris*), bobwhite (*Colinus virginianus*), and mourning dove (*Zenaida macroura*) are widespread. Of the 20-plus bird species present in mature forest, the most common are the pine warbler (*Dendroica pinus*), cardinal (*Cardinalis cardinalis*), summer tanager (*Piranga rubra*), Carolina wren (*Thryothorus ludovicianus*), ruby-throated hummingbird (*Archilochus colubris*), blue jay (*Cyanocitta cristata*), hooded warbler (*Wilsonia citrina*), eastern towhee (*Pipilo erythrophthalmus*), and tufted titmouse (*Baeolophus bicolor*). The red-cockaded woodpecker (*Picoides borealis*) is an endangered species that can be found in the area.

Forest snakes include cottonmouth moccasin (*Agkistrodon piscivorous*), copperhead (*Agkistrodon contortrix*), rough green snake (*Opheodryx aestivus*), rat snake (*Elaphe obsoleta*),

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coachwhip (*Masticophis flagellum*), and speckled kingsnake (*Lampropeltis getula holbrooki*). Fence (*Sceloporus undulatus*) and glass lizards (*Ophisaurus ventralis*) are also found, as is the slimy salamander (*Plethodon glutinosus*).

Several squirrels were observed in the residential area above the bluff during a site visit by a URS biologist on January 19, 2005. Two dead snakes, unidentifiable due to their stage of decomposition, were noted along Hwy 98. No other wildlife was observed.

Migratory Birds, and Threatened and Endangered Species

The Spanish Fort area is near one of the principal routes of the Mississippi flyway for migratory birds, which are to be considered in accordance with the MBTA. This route branches east and west from the Mississippi River delta and runs parallel to the U.S. Gulf of Mexico coast.

The U.S. Fish and Wildlife Service (USFWS) confirmed with a stamped response to the initial project correspondence (response dated September 30, 2003) that no listed, proposed, or candidate threatened and endangered (T&E) species were present in the project area. Two nests of the bald eagle, Federally protected by the Endangered Species Act and the Bald Eagle Protection Act, are known in the Mobile-Tensaw Delta approximately 5.5 and 6.5 miles north of the project site. It is possible that some of the large trees at the site may contain nests of one or more of the raptors that are common to the area (Clay, 2005). The Alabama redbelly turtle (*Pseudemys alabamensis*) is a Federally-listed endangered species found in the nearby delta areas. The turtle is not known to inhabit the roadway area along the base of the bluff (Clay, 2005).

Essential Fish Habitat

The Gulf States Marine Fisheries Commission has not mapped any Essential Fish Habitats (EFHs) in the project area, under the Magnuson-Stevens Fishery Act, but does consider any tidally-influenced water body on the Gulf Coast to be an EFH (Reubsiman, 2005). The tidally-influenced areas of Alabama are typically vital nursery areas for shrimp and juvenile fish. The North Fork of D'Olive Creek is part of a tidally-influenced marsh and estuarine network that also includes D'Olive Creek, Shellbank River, and D'Olive Bay. Sedimentation from the bluff is carried under Hwy 98 through cross-drains into the North Fork, which then flows into D'Olive Bay and the Shellbank River, contributing to the sedimentation of areas deemed EFHs.

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (FWCA) requires Federal agencies to consult with the USFWS if they are modifying the waters or channel of a body of water, and to consider the impact on fish and wildlife resources.

Environmental Consequences

No Action Alternative

The No Action Alternative would not impact biological resources because no construction would occur. However, this alternative would not stop bluff erosion, slumping, and landslides; mature vegetation areas on top of and on the bluffs would continue to be depleted, and wetlands and nearshore waters (North Fork of D'Olive Creek) below the bluff would continue to experience sedimentation from the bluff.

Buyout Alternative

The Buyout Alternative would remove landscaping next to the project site's structures and replace it with grass and/or native vegetation. This alternative would not stop bluff erosion, slumping, and landslides; mature vegetation areas on top of and on the bluffs would continue to be depleted, and wetlands and nearshore waters (North Fork of D'Olive Creek) below the bluff would continue to experience sedimentation from the bluff.

Proposed Action Alternative – Bluff Stabilization Project

The Proposed Action Alternative would greatly reduce bluff erosion, slumping, and landslides, thereby reducing the adverse impacts of erosion and sedimentation to habitats on and below the bluff. The Proposed Action Alternative would remove existing vegetation, including mature trees, on the bluff edge and slope, and replace it with grass on the stability benches.

An ADWFF representative stated that the Proposed Action Alternative should not cause any negative impacts on migratory bird species (Clay, 2005). The Proposed Action Alternative is within a flyway zone, but has a low potential to take migratory birds and would not modify migratory bird habitats.

The construction phase of the Proposed Action Alternative would displace fauna occupying the existing natural habitat to nearby areas with similar habitats. After construction, the City of Spanish Fort will vegetate the shelves with grass and some species would return.

In accordance with an email request by ADWFF for compliance with the MBTA, the large trees that must be removed during construction will be inspected prior to removal for raptor and/or migratory bird nests (see **Appendix B**). These trees will not be removed until the fledglings have left the nest.

The Proposed Action Alternative is located near EFH, but does not involve fill materials in water, so would not adversely affect an EFH (Reubsiman, 2005). In fact, due to the project's reduction of sedimentation into wetlands and nearshore waters, its impacts would benefit EFH. Per the FWCA, since the Proposed Action Alternative is not located in a waterway/body of water and would not adversely affect one, no FWCA consultation is required.

4.6 CULTURAL RESOURCES

Affected Environment

Background Literature Search Summary

Alabama has been inhabited for at least 12,000 years and has experienced several major changes in the cultural traditions of its residents. Several Native American cultures thrived in this area until the arrival of the Spanish. The Spanish were the first Europeans to settle this area. The influx of European diseases and war between the Native Americans and the Spanish resulted in the decimation of many tribes. Ultimately, the influx of Spanish, French, and English settlers led to the removal of Native Americans.

While not officially recognized until the 19th century, European settlement of Baldwin County began nearly 100 years earlier by families of Spanish and French descent. Along the Tensas River, within the area that later became Baldwin County, early French settlers raised rice and indigo, crops that were well suited to the land (Nuzum, 1971).

The community of Spanish Fort is situated at the western edge of Baldwin County overlooking the northeastern portion of Mobile Bay. It is named for the military fortification built by the Spanish in 1780 to defend Mobile from the British. The fort was later used as a defensive position guarding the eastern approach to Mobile during the Civil War. The Battles of Spanish Fort and Blakely were fought in March and April 1865, respectively, during the closing days of the war. Both times, Confederate defenders were overwhelmed by Union forces under the command of General Canby. Although both forts were overtaken, the action managed to delay the occupation of Mobile until after Lee had surrendered to Grant at Appomattox, which spared the city from being sacked and burned (Nuzum, 1971). Remnants of coastal defenses associated with Spanish Fort can still be found in and around the community today.

Consultation with Alabama State Historic Preservation Office (SHPO)

The City of Spanish Fort and FEMA have consulted with the Alabama SHPO and Alabama Historical Commission (AHC) throughout the NEPA process. In August 2004, SHPO indicated that the project area has a high potential for archaeological resources and requested that a cultural resource assessment be performed by a professional archaeologist. Subsequently, in concurrence with SHPO and on behalf of FEMA, URS conducted a Phase I archaeological survey of the project site in January 2005. The report, entitled, *Phase I Archaeological Survey for the Spanish Fort Bluff Stabilization Project, Baldwin County, Alabama*, was submitted to SHPO in May 2005, and SHPO concurred with the findings in August/September 2005.

Findings of the Cultural Resources Assessment

URS performed the cultural resource assessment of survey of lands within and immediately adjacent to the construction limits of the proposed stabilization project. The Phase I survey was conducted in accordance with procedural standards established by AHC in compliance with National Historic Preservation Act (NHPA) Section 106. The survey included a background literature search (discussed above) and examination of the proposed project's Area of Potential Effects (APE) through a combination of systematic (30-meter interval) and opportunistic shovel

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testing and visual inspection. Eighteen shovel tests were recorded during the investigation. Sixteen of these were situated behind or beside residences on top of the bluff, while two were placed judgmentally at suitable locations at its base.

The Phase I survey identified two Civil War-era gunnery mounds, resembling large grassy mounds, present within the project site. One of these mounds, Earthwork 1, is at the edge of the bluff and is in imminent threat of collapse; in fact, a small portion of its western edge has already disappeared over the bluff. Earthwork 2 measures about 9 x 9 x 1.5 meters, or roughly 30 x 30 x 5 feet (length x width x height). Earthwork 2 (1Ba577) is not currently threatened, and is sufficiently removed from the bluff's edge that it should not be directly affected by the project.

In URS' preliminary opinion, these two Civil War-era earthworks on the project site are eligible for inclusion in the National Register of Historic Places (NRHP) under Criterion A: Event. In a letter dated August 12, 2005, AHC concurred with URS' findings and stated that these two resources should be avoided by project activities. The letter also stated that if avoidance was not possible, then the City of Spanish Fort must conduct Phase II testing. The City of Spanish Fort issued Resolution No. 376-2005, dated December 19th, 2005, that the Mayor and City Council will contribute the \$15,000 necessary to implement a modified design of the bluff stabilization project to avoid the gunnery mounds.

Environmental Consequences

No Action Alternative

The No Action Alternative would not directly impact the two Civil War gunnery mounds. However, conducting no action would not address the bluff erosion, slumping, and landslides, which are an imminent threat to one of these mounds and an eventual threat to the other. The mounds would likely eventually be destroyed by erosion, slumping or landslides, or efforts by landowners to redirect surface water flow away from the bluff's edge.

Buyout Alternative

Under the Buyout Alternative, the purchase and demolition of residential structures would not directly impact the two Civil War gunnery mounds. However, since the Buyout Alternative does not address the bluff erosion, slumping, and landslides, these would eventually destroy the mounds.

Proposed Action Alternative – Bluff Stabilization Project

The Proposed Action Alternative would address the underlying threat of bluff erosion, slumping, and landslides that will eventually destroy both gunnery mounds. However, construction of the stabilization project has the potential to affect these cultural resources, as a small fraction of Earthwork 1 lies within the proposed project construction limits (Volkert and Associates, Inc., 2000). The City of Spanish Fort passed a resolution stating that it will select a design modification to the Proposed Action Alternative that will avoid the gunnery mounds during construction (**Appendix B**). Thus, a 10-foot (3-meter) buffer zone encompassing the bulwark at this site will be established around the perimeter of Earthwork 1 to protect the site from impacts during construction. A 10-foot (3 meter) buffer zone will be established around the northern and

western perimeters of Earthwork 2, with a larger area encompassed in the center of the buffer zone. The buffer should protect the site from impacts during construction, and encompasses both the bulwark and breastwork sections at this site, as well as the area in between the breastworks.

If avoidance of the two earthworks is not possible, then a Phase II evaluation and documentation, as required by the Alabama SHPO, will be conducted. The Phase II will include thorough photo-documentation and mapping, as well as a detailed history, for each resource that cannot be avoided, with specific project details determined through further consultation with SHPO.

4.7 LAND USE AND VISUAL RESOURCES

Affected Environment

The project site is located in The City of Spanish Fort in west-central Baldwin County, Alabama. The City is regulated by a local zoning ordinance, and the project area is zoned as residential. The average size of the lot's street frontage in the project area is about 121 feet, and the depth of the lot before the bluff slope is about 225 feet.

The project site is a roughly rectangular bluff located on the east side of Hwy 98 and north of I-10 in the City of Spanish Fort. Most of the site is undeveloped, with mostly natural vegetation. The soil has been exposed in some areas due to erosion. The site has single-family homes on top of the bluff. The bottom of the bluff includes the Hwy 98 right-of-way.

Of the areas surrounding the project site, some are undeveloped, while others are residential (**Figure 3**). The project site's eastern boundary is mostly residential. The western boundary is Hwy 98. The site is bordered by undeveloped land to the north and south. No prime farmland, protected under the Farmland Protection Policy Act, is in or next to the site.

The project area boundary for visual resources and aesthetic considerations is limited to the project site and surrounding land uses. Overall, the project site is residential at the top of the bluff with a highway corridor at the bottom of the bluff. The bluff slope vegetation is mostly hardwood trees with a few pines and non-native shrubs interspersed. Soil at the bluff top is sloughing and trees are uprooting and falling.

Environmental Consequences

No Action Alternative

The No Action Alternative would negatively impact land use, as no construction would occur and the bluff's continued erosion, slumping, and landslides would threaten the residential structures, ultimately decrease land values. The No Action Alternative would leave the trees intact, but it would not address bluff slumping and subsequent tree falling.

Buyout Alternative

The Buyout Alternative would change the land use from residential to permanent open space. The Buyout Alternative would adversely impact visual resources during the demolition phase of the project, but the impact would be temporary and insignificant, because the demolition phase

would last a maximum of 90 days in accordance with FEMA policy. After demolition, in accordance with FEMA policy, the City of Spanish Fort would convert the vacant lots into permanent open space. The presence of some open space in a neighborhood, if maintained properly, is generally considered an amenity.

Proposed Action Alternative

The Proposed Action Alternative would have little impact on land use, except to protect the existing residential properties on top of the bluff. Aesthetics of the bluff's slope would change from partly forested space to a terraced grassy slope. Aesthetics along the bluff's edge, which is eroding and slumping, taking trees, soil, and manmade drainage features with it, would change to a grassy slope and terrace.

4.8 NOISE AND AIR QUALITY

Affected Environment

Noise is defined as any undesirable or unwanted sound or audible disturbance that interferes with normal activity. The noise levels are typical of residential areas. No major noise generators are located near the project site. There is some noise from Hwy 98 at the bottom of the bluff.

Baldwin County is an attainment area under the Clean Air Act (CAA) for all air pollutants.

Environmental Consequences

No Action Alternative

Implementation of the No Action Alternative would not affect the noise or air quality. Conditions would continue as they are at present.

Buyout Alternative

The Buyout Alternative would temporarily impact noise and air quality during demolition. Demolition equipment (bulldozers, etc.) would emit pollutants while in operation, and airborne dust could be created by the demolition and grading activities; the temporary adverse impact would be similar to a normal construction project. Construction vehicles and equipment used for this project will be maintained in good working order to minimize noise and air pollution emissions during project work. BMPs will be implemented to control nuisance airborne dust generation, if necessary.

In addition, the demolition of 14 residential structures is regulated for ACMs. Spanish Fort will submit a Notice of Demolition and/or Asbestos Removal form to the ADEM-Air Division office in Montgomery (Hoffman, 2005). Guidance on how to handle and dispose of the different types of ACMs, as listed on the form, will be followed during demolition activities, to control the release of asbestos fibers.

Proposed Action Alternative

During construction activities such as heavy equipment excavation on the bluff slope would generate noise. The project would not cause permanent air emissions, and would only cause a temporary, localized, insignificant increase in air emissions during construction. Construction vehicles and equipment used for this project will be maintained in good working order to minimize noise and air pollution emissions during project work.

4.9 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

Affected Environment

In the U.S. 2000 census, the City of Spanish Fort had 5,419 residents with a median age of 41.1. In 2003, the population was estimated at 6,128 with a median age of 42.3. The median household income of Spanish Fort in 2003 was \$63,697 and the average household income was \$80,971 (Baldwin County Economic Development Alliance, 2005). The average median household income in the State of Alabama from 2000-2002 is \$36,771 (U.S. Census Bureau, 2005).

Pursuant to EO 12898 (Environmental Justice), Federal Actions to Address Environmental Justice in Minority Populations and Low-Income, there are no low-income and/or minority areas in or near the project area. The ethnic composition of Spanish Fort is primarily White Non-Hispanic (92.9 percent), with Black (4.4 percent) and Hispanic (0.9 percent) the primary minorities (City Data, 2005).

Environmental Consequences

No Action Alternative

Under the No Action Alternative, no action would occur. It would negatively impact the area's socioeconomics, because uncontrolled bluff erosion, slumping, and landslides would place properties at risk, which would then reduce property values. With the loss of houses and property taxes, the City would lose some tax revenue.

The No Action Alternative would not adversely affect any low-income and/or minority populations, as none are present.

Buyout Alternative

The Buyout Alternative would cost at least \$3 million. The non-Federal match for a buyout would either come from the homeowners or the City. While the acquired property, if maintained properly, would generally be considered an amenity to the remaining homeowners, the bluff erosion, slumping, and landslides would continue, which would eventually negatively affect the remaining and nearby homeowners' property values. With the loss of houses and property taxes, the City would lose some tax revenue.

Implementation of the Buyout Alternative would not adversely affect low-income and/or minority populations, as none are present.

Proposed Action Alternative

The Proposed Action Alternative would cost \$2.8 million (as estimated in 2003). The homeowners (\$641,300), Baldwin County (\$25,000) and the City of Spanish Fort (\$25,000) will combine funds to meet the non-Federal match. Bluff property would continue to increase, and the City would retain the tax revenue base.

This alternative would not adversely affect low-income and/or minority populations, as none are present.

4.10 HAZARDOUS WASTE AND MATERIALS

Affected Environment

Volkert and URS performed assessments of the Spanish Fort project site to identify potential hazardous and toxic materials and waste associated with the project, as described below. Additional information related to the assessment is presented in **Appendix E**.

No hazardous materials or wastes are currently stored, used, generated, or disposed of at the Spanish Fort project site. No former uses of the site were identified that involved or potentially involved hazardous materials.

No hazardous wastes are currently, or were formerly, generated or disposed of at the Spanish Fort project site. Contaminated soils and groundwater are not known to be associated with the site (Volkert, 2000). Toxic building materials such as ACM and LBP might be present in the onsite residential structures.

Environmental Consequences

No Action Alternative

The No Action Alternative would not have any impact on or from hazardous waste and materials.

Buyout Alternative

Before demolition, the City of Spanish Fort would need to obtain the necessary permits for handling and disposal of toxic building materials such as ACM and LBP. Removal of these materials, if present, would beneficially impact residents. Disposal of these materials would not result in a significant adverse impact, as the City of Spanish Fort would manage and dispose the materials at an approved landfill, in accordance with applicable Federal, State, and local laws and regulations.

The City of Spanish Fort would use hazardous materials (vehicle and equipment fuels and lubricants) onsite during demolition and construction. The use of BMPs, including provisions for control and cleanup of accidental spills and maintaining equipment in good working order, will reduce the impact of these materials.

Proposed Action Alternative – Bluff Stabilization Project

The Proposed Action Alternative would not result in an adverse impact on or from hazardous waste and materials. The City of Spanish Fort would use hazardous materials (vehicle and equipment fuels and lubricants) onsite during phases of the Buyout Alternative. The use of BMPs, including provisions for control and cleanup of accidental spills and maintaining equipment in good working order, will reduce the impact of these materials.

4.11 MITIGATION OF UNAVOIDABLE ADVERSE IMPACTS ASSOCIATED WITH THE ALTERNATIVES

Mitigation in this EA refers to actions that would reduce or eliminate potential adverse environmental and historic preservation impacts that could result from implementation of the project alternatives. All of the impacts described in the previous sections are minor and do not require any formal mitigation. All necessary permits (Table 1) will be obtained and the permit requirements will be outlined as performance specifications of the construction bid documents.

Bluff stabilization construction will include BMPs and the implementation of an erosion control plan and BMP plan (CBMPP) to minimize erosion and sedimentation during this phase, in accordance with NPDES. While some loss of tree cover on the bluff slope would occur during construction of the Proposed Action Alternative, it is also likely that some of these trees would likely be lost in the near future due to bluff slumping. As described in **Section 4.5**, the trees that must be removed during construction will be checked for raptor and migratory bird nests. Any tree containing a nest with fledglings will be avoided until the fledglings have left the nest.

4.12 CUMULATIVE IMPACTS

Cumulative impacts are defined as project effects that are greater in significance, when combined with the total effects of other actions, than the sum of the direct and indirect effects.

Local agencies have indicated one major project is planned in this area of Spanish Fort. This 257-acre commercial venture, Spanish Fort Town Center, will be mixed-use development containing retail stores, restaurants, a hotel, and an autopark (Renkert, 2005). The development will be located on the northeast corner of I-10 and Hwy 90, about 0.6 mile south/southeast from the project site. Based on a newspaper article written in 2005 (Kirby), a group was challenging the project's developer, in a U.S. District Court, and USACE's grant of a permit to fill 13.4 acres of wetlands near Joe's Branch.

Under the No Action Alternative, the retreat of the Spanish Fort bluffs would continue until houses near the edge of the bluff collapsed, and the resulting debris eventually covered the bluff slopes and Hwy 98. Adjacent areas of the bluff could become destabilized and erosion, slumping, and landslides could be exacerbated. This would result in danger to the residents of Old Spanish Fort Estates and to those persons traveling on Hwy 98, additional sedimentation, filling of wetlands, in-fill of the 100-year floodplain, destruction of cultural resources, and decreased property values and City tax revenues. Cumulative impacts of the No Action Alternative and the other development described above would occur to wetlands.

The Buyout Alternative would remove the houses from the zone of collapse, but would not address the bluff slumping, falling trees, and landslides. Adjacent areas of the bluff could become destabilized and erosion, slumping, and landslides could be exacerbated. This would result in danger to the public traveling on Hwy 98, additional sedimentation, filling of wetlands, in-fill of the 100-year floodplain, destruction of cultural resources, and decreased property values and City tax revenues. Cumulative impacts of the Buyout Alternative and the other development described above would occur to wetlands.

Under the Proposed Action Alternative, the primary impacts are beneficial: reducing bluff erosion, slumping and landslides, which would then, among others, reduce sedimentation into the wetlands and of nearshore waters below and beyond the bluff, and protect cultural resources. While the Spanish Fort Town Center project could have a more adverse impact on project area wetlands, the proposed Spanish Fort Bluff Stabilization Project would generally have a positive impact on these wetlands. Therefore, the proposed project would not have any net adverse cumulative wetlands impacts.

4.13 IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES

Regulations for the preparation of NEPA compliance studies require evaluation of irreversible and irretrievable commitments of resources associated with the alternatives. The implementation of the Proposed Action Alternative would commit energy resources for the construction vehicles; the amount of fuel that would be needed is insignificant and would not result in significant adverse effects on fuel supply.

Within the scope of this project, the Proposed Action Alternative would not result in taking of any habitat species or cause any significant adverse impact to the environment or cultural resources. The City of Spanish Fort has committed to a design modification of the Proposed Action Alternative that would avoid the gunnery mounds during construction. Overall, the project would beneficially impact both the environment and the Civil War gunnery mounds. Existing vegetation on the bluff slopes would be removed. Wetlands damaged or degraded during construction of the Proposed Action Alternative would be restored in accordance with the conditions of Nationwide Permit 33.

4.14 POTENTIAL FOR GENERATING CONTROVERSY AND PUBLIC INVOLVEMENT

The potential for the project alternatives to generate controversy was assessed by reviewing the newspaper articles written about the project during the past nine years, and by assessing comments received from the public and regulatory agencies on the project. No controversial issues have been identified in association with the Proposed Action Alternative. The public and regulatory agencies will be provided the opportunity to review and comment on this Draft EA prior to FEMA's decision regarding the project, and input received will be further assessed for potentially controversial issues.

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According to the City of Spanish Fort's PDM application, the 14 property owners would not be interested in the Buyout Alternative, so there would be controversy if this alternative was selected.

Over 39 letters have been written searching for aid and in support of the bluff stabilization project. Many of these letters were written to U.S. Congressional Representatives and local representatives, leading to some of these officials to joining the letter writing campaign to help Spanish Fort, by writing to relevant agencies and other Congressional representatives. Some of these letters were to regulatory agencies. At least 14 citizens participated in the letter-writing efforts. The regulatory agencies that commented on the Proposed Action Alternative have not provided any negative comments about the project.

Numerous articles have been published in various newspapers throughout Alabama regarding issues such as the necessity for action and budget appropriations for the proposed Spanish Fort Bluff Stabilization Project. A partial listing of the articles and summaries of each article are presented below.

Date: August 1997

Article Title: "Saving bluffs can be costly"

Newspaper: Mobile Register (Mobile, AL)

Engineers believe that the cost of stabilizing an 80- to 100-foot-tall bluff would exceed the value of the houses and land on top of the bluff. The bluffs need properly engineered terraces to slow serious erosion from large scale rain storms. Vegetation, such as trees and grasses, can be used to help control topsoil erosion.

Date: August 6, 1997

Article Title: "FEMA may give hope to bluff dwellers"

Newspaper: Source unknown

A 700- to 800-foot-wide portion of the Spanish Fort bluff collapsed during Hurricane Danny, covering Hwy 98 with soil and debris for over two weeks. FEMA's Hazard Mitigation Grant Program could help the Spanish Fort community by buying the property, moving structures, or developing ways to protect the structures in the future. \$1 million of hazard mitigation funds have been freed to be awarded to Alabama citizens who apply for and are then awarded a grant.

Date: August 8, 1997

Article Title: "FEMA is the bright spot for Baldwin"

Newspaper: Mobile Register (Mobile, AL)

Residents of Baldwin County who have houses on the bluff are finding hope in FEMA's Hazard Mitigation Grant Program. FEMA does not want to get the citizens hopes up too high, as they only have about \$800,000 to spend in Alabama, and anyone can apply for the money. This amount of money would not be sufficient for a buyout of citizens' waterfront homes, which often cost \$650,000 a piece.

Date: August 8, 1997

Article Title: "Erosion battle pivotal to house"

Newspaper: Mobile Register (Mobile, AL)

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Engineers are studying ways to stop erosion of the bluffs above Mobile Bay as parts of them washed down across one lane of Hwy 90–98, and houses atop the bluffs are nearing the edge. They are considering moving one resident’s entire house, which has already experienced some structural damage from the eroding bluffs.

Date: August 8, 1997

Article Title: “Bluffs price tag could hit \$6 million”

Newspaper: Mobile Register (Mobile, AL)

The cost to fix 2,300 feet of the Baldwin County Spanish Fort bluffs is estimated to be \$3-6 million. Spanish Fort is the only city on Baldwin’s Eastern Shore to express interest in receiving public (local, State, and Federal) funding to fix the bluffs. \$3 million would simply stabilize the bluffs and \$6 million would stabilize the bluffs and turn them into usable public space, such as a park.

Date: August 17, 1997

Article Title: “Bay Slide Acres”

Newspaper: Mobile Register (Mobile, AL)

After the 20 inches of rain from Hurricane Danny, one man’s home is now located only a few yards from the edge of the 80-foot Spanish Fort bluff. Geologists say that landslides are a natural event and have occurred historically for many years. The bluffs are primarily made of sand, which liquefies during heavy rains.

Date: February 17, 1998

Article Title: “El Nino could finish off Bay bluffs”

Newspaper: Mobile Register (Mobile, AL)

January record rainfall from El Nino took another big bite out of the eroding bluffs in Baldwin County. One Spanish Fort resident lost another foot of property along with a fence down the edge of the bluff during these rains. Some residents have taken solutions to the bluff problem into their own hands, but engineers say that these solutions are at best cosmetic and temporary.

Date: February 18, 1998

Article Title: “El Nino’s not a joke; ask the bluff dwellers”

Newspaper: Mobile Register (Mobile, AL)

El Nino’s intense recurring thunderstorms have washed mud and sand from the bluffs of Baldwin County. This has demonstrated the serious need to study the bluffs and develop a plan for their stabilization.

Date: March 10, 1998

Article Title: “Water damage is widespread in Baldwin”

Newspaper: Mobile Register (Mobile, AL)

A storm released 16 inches of rain on Baldwin County causing damage to school buildings and stores. One lane of Hwy 90 in Spanish Fort was closed due to a section of the road that collapsed from a damaged drainage pipe.

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Date: January 8, 1999

Article Title: “Birders, boomboxes, Bachman’s sparrow”

Newspaper: Mobile Register (Mobile, AL)

Mobile Bay has received decades of runoff and sedimentation from the ever-increasing development of the surrounding area. This has decreased populations of aquatic flora and fauna in the undeveloped land in the area.

Date: September 10, 1999

Article Title: “Slippery slope: Repairs for erosion damage elusive”

Newspaper: Mobile Register (Mobile, AL)

The city of Spanish Fort is trying to get a Federal grant to help stabilize the crumbling bluff that was once the battleground for the last days of the Civil War. The Spanish Fort City Council voted unanimously to apply for a FEMA Hazard Mitigation Program grant to pay for 75 percent of an engineering study to determine a solution and cost estimate to fix the bluff. State and Federal agencies have rejected offers from residents of the area that have offered to sell their lands atop the bluff to the agencies.

Date: September 21, 1999

Article Title: “Whither Eastern Shore bluffs?”

Newspaper: Mobile Register (Mobile, AL)

Thirteen homeowners on Spanish Fort bluff asked officials to request Federal funding to help pay for a study on how to fix the eroding bluff. The city agreed. If the Federal funding is received, the city, county, and private landowners will be required to pay for 25 percent of the study, estimated to cost \$237,000.

Date: July 11, 2001

Article Title: “Vanishing bluffs”

Newspaper: Mobile Register (Mobile, AL)

Several homeowners of the Ecor Rouge bluffs in Fairhope, AL, have constructed an 85-foot high wall in attempts to help stop the bluff from eroding. Some citizens are concerned about the retention wall destroying natural habitat and defacing the bluff, an enduring symbol and once natural area. There have also been complaints about silt from the construction project flowing into Mobile Bay, and complaints of sand and clay piles left on the beach to be inadvertently washed into the bay.

Date: November 13, 2001

Article Title: “Expert to discuss erosion control, Bay”

Newspaper: Baldwin Register (Baldwin County, AL)

An erosion-control convention was held to help keep Mobile Bay clean and healthy. The convention was held in Fairhope, AL, for land developers primarily from Mobile and Baldwin Counties.

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Date: May 21, 2003

Article Title: "Homes balance on the bluff"

Newspaper: NBC 15 WPMI

Homeowners of Spanish Fort bluff have been watching their property disappear down the bluff over the years. One resident lost 25 feet of property that contained his pool and shed. Thirteen of the homeowners say that the reason for the serious erosion of the bluff is the highway below, which was widened. In the process of widening the road, some believe that the bluff was too deeply cut into. FEMA has approved a plan to fix the problem, but does not have the total funding to complete the project.

Date: May 30, 2003

Article Title: "County qualifies for FEMA funds"

Newspaper: Mobile Register (Mobile, AL)

FEMA approved eligibility for individual assistance grants for about 100 Baldwin County residents whose homes were damaged during recent rain storms. Baldwin County local governments will not be eligible, because total damage to public structures did not meet FEMA's financial threshold.

Date: May 2003

Article Title: "Bill bites into bluff"

Newspaper: Mobile Register (Mobile, AL)

Tropical Storm Bill claimed 10 feet of property and a 75-year-old oak tree from a Spanish Fort bluff resident on Monday night.

Date: July 16, 2003

Article Title: "Agencies pledge help with soil erosion"

Newspaper: Mobile Register (Mobile, AL)

Representatives of 10 government agencies agreed to help with the erosion problem of the Lake Forest subdivision. The residents have had a problem with soil erosion buildup in Lake Forest Lake from continuous development in the area.

Date: October 14, 2003

Article Title: "Federal grant could help bluffs for now"

Newspaper: Mobile Register (Mobile, AL)

Since the effects of Hurricane Danny in 1997, the Spanish Fort bluffs have been seriously eroding and depleting the yards of 14 of the residents on the bluff. The homeowners want the bluff terraced to hopefully eradicate the problem. This is estimated to cost \$3 million, and Spanish Fort officials have applied for a \$2.2 million (75 percent) Federal grant for the stabilization project. The county and city have given \$25,000 to the project, and homeowners will have to contribute the rest. Some citizens have criticized the contributions made by the county and city because the bluffs are private property. Others argue that the public will benefit from the project because the serious erosion threatens Mobile Bay and Hwy 98. Some believe that development should have been restricted along the bluff years ago, but since that did not happen, it should be restricted now.

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Date: June 30, 2004

Article Title: “New hope for Spanish Fort bluff”

Newspaper: Mobile Register (Mobile, AL)

FEMA has been acquiring more information on the proposed Spanish Fort Bluff Stabilization Project, for which the city requested a grant. The grant money would likely be dispatched on a reimbursement basis, but the city does not have enough funding to front the \$2,073,900 grant. Homeowners on the bluff have agreed to pay the remaining \$700,000 required for the project.

Date: July 15, 2005

Article Title: “Heavy rains could threaten bluff”

Newspaper: Mobile Register (Mobile, AL)

Two years after application, Spanish Fort bluff residents and local officials are still not sure if they will receive the \$2.25 million Federal grant to repair and stabilize the bluff. Many are concerned that one of this year’s Atlantic storms or heavy rain events may be the last, causing the bluff to crumble, destroying the homes atop it and buying the roadway beneath it. FEMA says that the process is awaiting AHC’s review of an archaeological study (conducted in support of the proposed project). State representative Randy Davis says that the cost of the project may have increased since the application in 2003, but he still believes there is enough money to cover the project. If the grant is received, a drainage system will be installed to stabilize 14 homes on the bluff.

Date: August 15, 2005

Article Title: “Officials seek help on grant”

Newspaper: Mobile Register (Mobile, AL)

Baldwin County commissioners and Spanish Fort city officials have urged U.S. Rep. Joe Bonner to push a more than \$2 million grant application that has been on hold for nearly 2 years. Baldwin County commissioners are scheduled to vote Tuesday to reaffirm an agreement made with Spanish Fort to set aside \$25,000 as part of the required non-Federal match. Baldwin County Emergency Management Agency Director Leigh Anne Ryals said Federal crews recently discovered Civil War artifacts along the bluff and wetlands near the base. She said a survey of the area was about 85 percent complete, but officials could not say when the study might be finished. “We were told the grant was due to be approved in March, and here it is August and it’s bottled up on somebody’s shelf apparently collecting dirt,” Mayor Joe Bonner said.

Date: December 21, 2005

Article Title: “Spanish Fort Bluff Civil War relics get protection”

Newspaper: Mobile Register (Mobile, AL)

The Spanish Fort City Council has agreed to pay \$15,000 to help protect Civil War relics near the eroding bluff on the western edge of town. However, efforts to stabilize the precipice remain in limbo. Mayor Joe Bonner said he had been told that part of the snag was because USACE identified gun emplacements along the bluff, and the grant could not be approved unless those were protected. The \$15,000 will go toward fencing and signs around the roughly 75-by 50-foot mounds “to make sure they’re in the same position at the end of construction that they were in the beginning,” the mayor said. The long delay has prompted officials to consider alternatives,

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like dredging dirt from the bottom of Lake Forest Lake in Daphne and use it to fill in the eroding bluff in the backyards of residents on Patrician Drive. However, this soil was not the appropriate type of soil needed to correct the erosion of the bluff. U.S. Rep Jo Bonner sent a letter to FEMA in August asking the agency to give the application “the utmost consideration”. Mayor Bonner acknowledges that the Hurricane Katrina’s severe damage to the Gulf Coast has tied up Federal money in other projects.

5.0 AGENCY COORDINATION

The following agencies were contacted to prepare this EA or provided written input:

Alabama Department of Environmental Management, Coastal Section
4171 Commanders Drive
Mobile, AL 36615
(251) 432-6533

Alabama Division of Wildlife and Freshwater Fisheries
P.O. Box 247
Daphne, AL 36526
(251) 626-5474

Alabama Emergency Management Agency
5898 County Road 41, P.O. Drawer 2160
Clanton, AL 35046
(205) 280-2200

Alabama Historical Commission
468 South Perry Street
Montgomery, AL 36130

Baldwin Soil and Water Conservation District
1504-C, Highway 31, South
Bay Minette, AL 36507

City of Spanish Fort
7581 Spanish Fort Boulevard
Spanish Fort, AL 36527
(251) 626-4884

Gulf States Marine Fisheries Commission
P.O. Box 726
Ocean Springs, MS 39566
(228) 875-5912

U.S. Department of Agriculture, Natural Resources Conservation Service
1504-C, Highway 31, South
Bay Minette, AL 36507

U.S. Army Corps of Engineers
109 Saint Joseph Street
Mobile, AL 36602

U.S. Fish and Wildlife Service
US Department of Interior
P.O. Drawer 1190
Daphne, AL 36526

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7.0 LIST OF PREPARERS

This EA was prepared by URS Group, Inc. on behalf of FEMA and under the technical direction of the FEMA Region IV Environmental Officer. URS has no financial or other interest in the direct outcome of the project.

The following technical staff prepared or reviewed the EA:

Patti Slade, Senior Geologist, NEPA Project Manager. Ms. Slade (project manager, technical researcher, and document author) has more than 20 years of experience in NEPA documentation, environmental planning, environmental due diligence, and geological studies. She serves as URS' NEPA Project Manager for a variety of Federal and State agencies, including USACE Nashville District, Department of Veterans Affairs, Robins Air Force Base, U.S. Postal Service, Federal Aviation Administration, and U.S. Department of Justice. She works on a variety of interdisciplinary projects, including stormwater/NPDES permitting, Phase I ESAs and Phase II investigations, geotechnical investigations, asbestos and lead-based paint surveys, cultural resources surveys, indoor air quality surveys, county-wide flood damage reduction projects, and regulatory compliance projects. She has also performed or managed completion of numerous NEPA documents for FEMA.

Lawrence Frank, Senior Environmental Planner. Mr. Frank (technical researcher and document author) has over 12 years of experience in the floodplain management and water resource fields. Prior to coming to URS, he worked at FEMA Region IV for 10 years, where he assisted numerous local and State governments in the development and implementation of flood mitigation projects. He has conducted training sessions and written national guidance concerning issues of development in floodplains. Mr. Frank also has a wide range of experience researching and writing various NEPA documents. In addition, Mr. Frank passed both the Association of State Floodplain Manager's Certified Floodplain Manager's exam and the American Planning Association's American Institute of Certified Planner's exam.

Jennie Agerton, Project Biologist. Ms. Agerton (technical researcher and document author) has 7 years of experience in NEPA; ecological field surveys; permitting; and evaluation of impacts to cultural, physical, and social environments. She specializes in Section 404 permitting, botany, wetlands/water quality, threatened and endangered species, environmental management, UST site investigations, and risk-based correction action evaluations. She has also conducted protected and invasive species surveys and performed jurisdictional wetland and "Waters of the United States" determinations and classifications for the purposes of satisfying NEPA, and for the acquisition of permitting for a variety of site and corridor projects.

Patrick Smith, Project Archaeologist. Mr. Smith (technical researcher and document author) has 11 years experience in Cultural Resources Management and the archaeology of the Southeastern U.S. He has directed survey, testing, and/or mitigation projects for a number of clients, including the Georgia and Alabama departments of transportation, FEMA, Fort McClellan, and Fort Benning Military Reservation in Georgia. In 2001, he directed the excavation of a 40,000 square meter portion of Kasita (9CE1), a Lower Creek town situated on Lawson Army Airfield. He joined the Atlanta office of URS after several years of employment with Panamerican Consultants in Alabama and Georgia.

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Laurel Key, Environmental Scientist. Ms. Key (technical researcher and document author) recently graduated with honors and received a Bachelor of Science degree in environmental science. She has 5 years of experience in the environmental field. She has completed internships that involved field research and biological surveys. For URS, she is involved with several interdisciplinary projects, including Phase I Environmental Site Assessments, National Infrastructure Support Technical Assistance Contract work for FEMA, Architectural Barriers Act compliance auditing for the U.S. Postal Service, radon and mold surveys, and indoor air quality projects. She has also prepared NEPA EAs for submittal to different Federal authorities for proposed development projects.

Stephen Carruth, Senior Environmental Planner. Mr. Carruth (document peer reviewer) has 15 years of environmental review experience and is the URS national coordinator for all environmental activities related to FEMA work. He has prepared hundreds of EAs and Categorical Exclusions (CATEXs) for FEMA. Mr. Carruth is also an instructor of two FEMA environmental review and operations classes. He received a Master of Science in Environmental Science from Indiana University in 1997.

Dr. William Straw, FEMA Region IV Environmental Officer. Dr. Straw (document reviewer) has 26 years of environmental survey, review, planning, restoration, documentation, and training experience. He has prepared more than 75 EAs and several hundred Categorical Exclusions (CATEXs). He has reviewed several Environmental Impact Statements, several hundred EAs, and several thousand CATEXs. Dr. Straw developed FEMA R4's environmental and historic preservation (EHP) policies and procedures, cadre position descriptions and performance standards, professional development tracks and training, job and training manuals and aids, and FEMA-State-Local technical assistance and public education workshop materials. He also helped revise FEMA's national EHP regulations and develop subsequent national EHP policies, procedures, cadre, courses, manuals, and aids. Dr. Straw jointly prepared and delivered many FEMA R4-State-Local sessions and workshops for disaster preparedness, project development, grant applications, etc. He also served as Senior Instructor for FEMA's national EHP training courses. Dr. Straw passed the Association of State Floodplain Manager's Certified Floodplain Manager's exam, and has conducted several thousand Executive Order 11988 project floodplain management reviews.

**Appendix A
Finding of No Significant Impact
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**Appendix B
Agency Correspondence**

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**Appendix C
Site Photographs**

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**Appendix D
Preliminary Design Plans**

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**Appendix E
Supplemental Phase I ESA Information**

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A Phase I Environmental Site Assessment (ESA) was conducted for the project area by Volkert Environmental Group, Inc. (Volkert) in December of 2000. The ESA objective was to assess the presence of recognized environmental conditions that may exist as a result of past or present uses of the properties within the subject area, in accordance with the American Society for Testing and Materials (ASTM) Standard E 1527-94. ASTM E 1527-94 defined a recognized environmental condition as:

... the process or likely presence of any hazardous substance or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property. Findings are based on information obtained through Federal and State databases and site reconnaissance.

Findings and conclusions presented in Volkert's report, *Phase I Environmental Site Assessment*, dated December 8, 2000, are summarized below.

Historical Land Use

Historical sources reviewed included interviews, historical aerial photographs from the Natural Resources Conservation Office of Baldwin County, and various current State and Federal databases, all compiled by Volkert in 2000.

Review of the 1955 aerial photograph indicates the site area was undeveloped, and the surrounding area was primarily undeveloped. The 1981 aerial photograph also shows the site to be undeveloped, but the surrounding areas were considerably more developed, appearing to be residential. The 1992 aerial photograph shows the site to be in a similar condition to that of the 1981 photograph (Volkert, 2000).

Site Reconnaissance

Volker conducted a pedestrian site reconnaissance at the Spanish Fort site in 2000; site conditions were photographed (as appropriate) and documented.

The subject site was described as a roughly rectangular bluff located on the east side of Hwy 98 and north of I-10 in the city of Spanish Fort, AL. The majority of the area was undeveloped, with natural vegetation dominating the landscape. The soil had been exposed in some areas due to erosion. In 2000, the site contained single-family dwellings located on top of the eroding bluff. Previous measures that had been made to control runoff appeared to be ineffective.

Of the areas surrounding the site, some were undeveloped while others were developed as residential areas. The site's eastern boundary was dominated by residential areas. The western boundary was Hwy 98. The site was bordered by undeveloped land to the north and south.

The visual topography of the site implied that the site drains from the east to the west. Stormwater pipes were observed in the area to help with runoff, but due to the significantly steep grade, runoff reportedly drained rapidly, picking up large amounts of sediment. Soils in the area

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of the site were reported as being only moderately permeable, with runoff percolating into the uppermost saturated zone and ultimately flowing into Mobile Bay (Volkert, 2000).

Electrical power was supplied to area residents by Riviera Utilities. Water was supplied to the city by the Utilities Board of the City of Spanish Fort, and sewer was supplied by the City of Daphne, though most houses were reported to have septic tanks. The City of Fairhope provided natural gas service and Bell South supplied telephone service.

The pedestrian site reconnaissance found no hazardous substances were being used or stored on the subject property. No petroleum products were found to be used or stored on the subject property. No onsite ASTs or USTs were identified at the time of the site visit, other than septic tanks. No drums or containers were present on the property. There were no transformers present on the subject property. No wells were identified on the subject property. No stains, corrosion, or stressed vegetation was present on the subject property. No suspect ACMs were identified during the site visit (Volkert, 2000).

Database Review

The purpose of the database review was to assess the potential presence of hazardous substance contamination as a result of activities conducted on properties within the Spanish Fort project area. Information was obtained from public agencies (Federal, State, and local) to assess whether current and past property usage in the vicinity of the project area may have created a potential for contamination. The search of Federal and State database listings was provided by EDR. The records review was based on the ASTM Practice and consists of the following:

The database review was conducted for the Spanish Fort project area and adjoining properties. In summary, within a 1-mile radius, no sites were listed on the National Priority List, on the Corrective Action Report, nor were they listed as having any State Hazardous Waste Sites.

Within a half-mile radius, no sites were listed on the Comprehensive Environmental Response, Compensation, and Liability Information System or the Resource Conservation and Recovery Act (RCRA) list, nor were there any permitted landfills in the area. The site and adjoining properties in a 0.25-mile radius were not listed on the RCRA Generator list.

The site was not listed on the Emergency Response Notification System list. EPA records indicate that all the target property is listed on Facility Index System (FINDS).

According to the EDR UST database, the subject property is not listed as having any leaking underground storage tanks (LUSTs) or USTs. One site within 0.25 mile from the subject property is listed as having USTs. The Money Back #39 gasoline station, at 6583 Hwy 90 in Spanish Fort, AL, has three USTs, all containing unleaded gasoline. All three tanks were installed April 15, 1995, and are constructed of fiberglass plastic with fiberglass corrosion protection (Volkert, 2000).

Three sites out of a 0.25-mile radius of the subject area are listed as having LUSTs: Speedway/Starvin Marvin #9090, Spanish Fort BP, and Tensaw River Cypress. Two sites out of

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a 0.25-mile radius of the subject area are listed as having USTs: Tensaw River Cypress and Papa Johns C. Store. Five sites out of a 0.25-mile radius of the subject area are listed as FINDS: Spanish fort Wrecking, Inc., The Shoulder, Spanish Fort, Old Spanish Fort Christian School, Spanish Fort Estates, Inc., and Spanish Fort Water Systems, Inc. Due to inadequate information, addresses for the sites are unknown.

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Appendix F

Figures Showing Earthwork #1 Plan View and Earthwork #2 Plan View

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