

**ENVIRONMENTAL ASSESSMENT
FOR REHABILITATION OF
DAMAGED FLOOD CONTROL WORKS
LOWER WHITE OAK BAYOU
FEDERAL FLOOD CONTROL PROJECT
HARRIS COUNTY, TEXAS**

**U.S. ARMY CORPS OF ENGINEERS, GALVESTON DISTRICT
GALVESTON, TEXAS
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**Environmental Assessment
for Rehabilitation of
Damaged Flood Control Works
Lower White Oak Bayou
Federal Flood Control Project
Harris County, Texas**

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1.0 PROPOSED ACTION

The U.S. Army Corps of Engineers (USACE) Galveston District, has prepared this Environmental Assessment (EA) to evaluate the potential impacts associated with the recommended plan to conduct emergency repairs to the Lower White Oak Federal Flood Control Project (Lower White Oak FFCP). This EA was prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) and Council on Environmental Quality regulations to document findings concerning the environmental aspects of the proposed action.

1.1 PROJECT DESCRIPTION

The Lower White Oak FFCP is located on White Oak Bayou, a major tributary in the Buffalo Bayou watershed that drains much of the urbanized area of northwest Houston and the surrounding area. The Lower White Oak FFCP was authorized by the Flood Control Act of 1954 as a part of the Buffalo Bayou and Tributaries Federal Flood Control Project. The existing Federal channel in the lower reach of White Oak Bayou consists of 10.7 miles of channel improvements from the confluence of White Oak Bayou and Buffalo Bayou to Cole Creek (Figure 1). The improvements consist of clearing, straightening, enlarging, and partial concrete lining the trapezoidal, earthen channel sections to provide protection against the Standard Project Flood (SPF). Construction of the first 8.6 miles of the Lower White Oak Bayou FFCP was completed in 1970. A 2.1 mile extension of the original Federal project was completed in 1976.

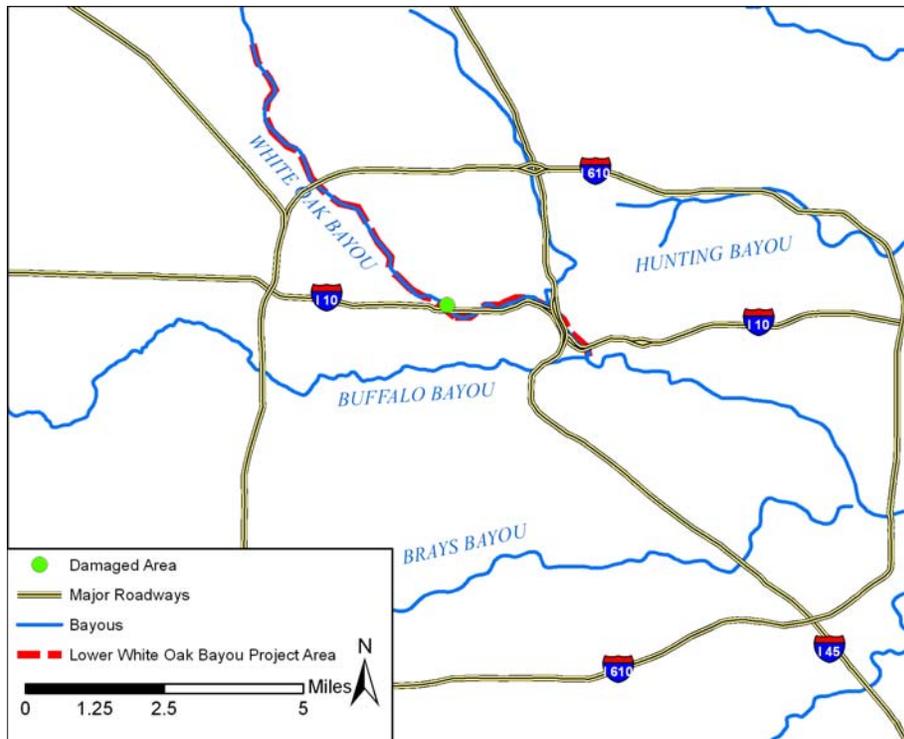


Figure 1. Overview of the Project Area

The Lower White Oak FFCP is located in a heavily urbanized portion of Houston. The Lower White Oak FFCP right-of-way (ROW) is continually maintained by the County and consists of periodic mowing to facilitate flood flows and access to the site.

1.2 PURPOSE AND NEED FOR PROJECT

Hurricane Ike made landfall in northern Galveston County on September 13, 2008. The Project area received 16.09 inches of rain between September 13th and September 15th, 2008 (National Weather Service 2008). The maximum discharge rate recorded at White Oak Bayou during this time was 20,000 cubic feet per second (CFS). This maximum discharge rate was the 4th highest rate recorded in the past 72 years at the United States Geological Survey station (USGS 2008).

This high rainfall runoff from Hurricane Ike generated a powerful scouring action which damaged an area along White Oak Bayou near Interstate 10 (I-10) and Yale Street (Figure 2). This area is located above the top of the concrete channel lining and is not protected from scouring. The resultant scouring forces from Hurricane Ike created voids behind the existing concrete lining. These voids have resulted in a potential risk of slope failure to both the concrete-lined slope and the uphill earthen slope.



Figure 2. Location of damaged area to be repaired.

The Harris County Flood Control District (HCFCF) is responsible for maintenance of the Lower White Oak FFCP. The HCFCF has filled in the voids with a cement stabilized material around the existing appurtenance and re-vegetated the overflow area along the bank. While the damaged area has been repaired, the soils in this area are highly erodible when exposed to high flow and the current repairs would be susceptible to repeated scouring and the development of new voids. If this should occur, there is a significant chance the existing concrete lining could collapse, disrupting the flow of the channel and potentially impacting the I-10 Bridge over White Oak Bayou.

1.3 PROPOSED PROJECT

The USACE proposes to repair the damaged area. The repairs need to be conducted to bring the damaged area up to current engineering standards. Current engineering standards would provide a greater level of reliability in the system. Various erosion prevention techniques have been tested at scour prone areas, including: turfmat (a durable mat designed to prevent water intrusion with turf on top), flowable fill (fill that allows water flow through it while preventing erosion), riprap backfill under the lining (removing the earth under the concrete lining and replacing it with rip rap), and vegetative erosion matting (a durable mat that prevents erosion with vegetation on top). Scour prone areas treated with these techniques continue to suffer damage during large flood events. While any of these techniques would increase the reliability of the existing system, the damaged area would continue to be in danger of collapse and will need repairs after each flood event. The most appropriate technique to correct the problem and reduce the need for future repairs is the placement of a concrete scour pad at the top of the exiting concrete channel lining.

2.0 ALTERNATIVES

Two primary alternatives were studied for the proposed repairs, the No Action Plan (Alternative 1) and the Repair to Current Engineering Standards Plan (Alternative 2).

2.1 ALTERNATIVE 1 – NO ACTION

Under the No Action Plan, the Harris County Flood Control District (HCFCD) would continue to maintain the Lower White Oak FFCP. This continued maintenance would keep the Lower White Oak FFCP operating. However, the damaged area would continue to be susceptible to scouring from flood events.

The potential for slope failure and collapse of the concrete lining would remain. If the slope failed and/or the concrete lining collapsed, concrete and sediment in the channel would likely induce upstream flooding and increase the rate of scouring at the damaged area. This scenario could also result in damage to the I-10 Bridge. The I-10 Bridge is located approximately 50 feet downstream of the damaged area. If the concrete lining collapsed into the channel, flood waters could push the lining into, and damage, the I-10 Bridge supports. I-10 is one of the main East/West roads through the Houston metropolitan area and if the I-10 Bridge were damaged, it could effectively shut down the Interstate until repairs were completed, resulting in significant impacts to traffic flow throughout the Houston area.

2.2 ALTERNATIVE 2 – REPAIR TO CURRENT ENGINEERING STANDARDS PLAN (PREFERRED PLAN)

Under the Repair to Current Engineering Standards Plan, the USACE would repair the damaged area to current engineering standards. The current engineering standards consist of providing a concrete scour pad across the 10-foot overbank by doweling the new concrete to the existing concrete lining. The scour pad would be protected from rapid drawdown scenarios by providing two weep holes spaced on fifteen foot centers. Excavation would be required for the placement of a sand filter bedding separated from the natural ground surface by geotextile fabric. Coarse gravel (2" x 2") would collect the subsurface drainage at the weep holes to release pressure from under the concrete surface. The limits of the repair would cover an approximate length of 450 feet.

These repairs would correct the problem of the area being prone to scouring. If the area were no longer scour prone, then the threat of slope failure and/or collapse of the concrete lining would be either significantly reduced or entirely eliminated. The repairs would also help prevent the I-10 Bridge from being impacted from a collapse of the concrete channel lining.

2.3 COMPARISON AND EVALUATION OF ALTERNATIVES

The purpose of the proposed repairs is to significantly reduce the threat of both slope failure and a collapse of the concrete lining in the damaged, scour prone area. Under Alternative 1 (No Action), the damaged area would be repaired, but the potential for slope failure and collapse of the concrete lining would remain during future large flood events. Under Alternative 2 (Repair to Current Engineering Standards), the damaged area would be protected from future scouring. This protection would significantly reduce the threat of both slope failure and collapse of the concrete lining.

Because Alternative 1 (No Action) does not adequately address the purpose and need of the project, it was not considered to be acceptable. Alternative 2 does address the purpose and need of the project. Accordingly, the recommended plan is to repair the damaged section to current engineering standards (Alternative 2).

3.0 AFFECTED ENVIRONMENT

3.1 STUDY AREA

White Oak Bayou, located in the San Jacinto River Basin, originates in northwest Harris County and flows southeast for approximately 25 miles through the City of Jersey Village and the City of Houston where it outfalls into Buffalo Bayou near downtown Houston. White Oak Bayou provides drainage to approximately 69,120 acres (approximately 108 square miles) of northwest Houston and the surrounding area. This area consists of a mixture of residential and commercial structures.

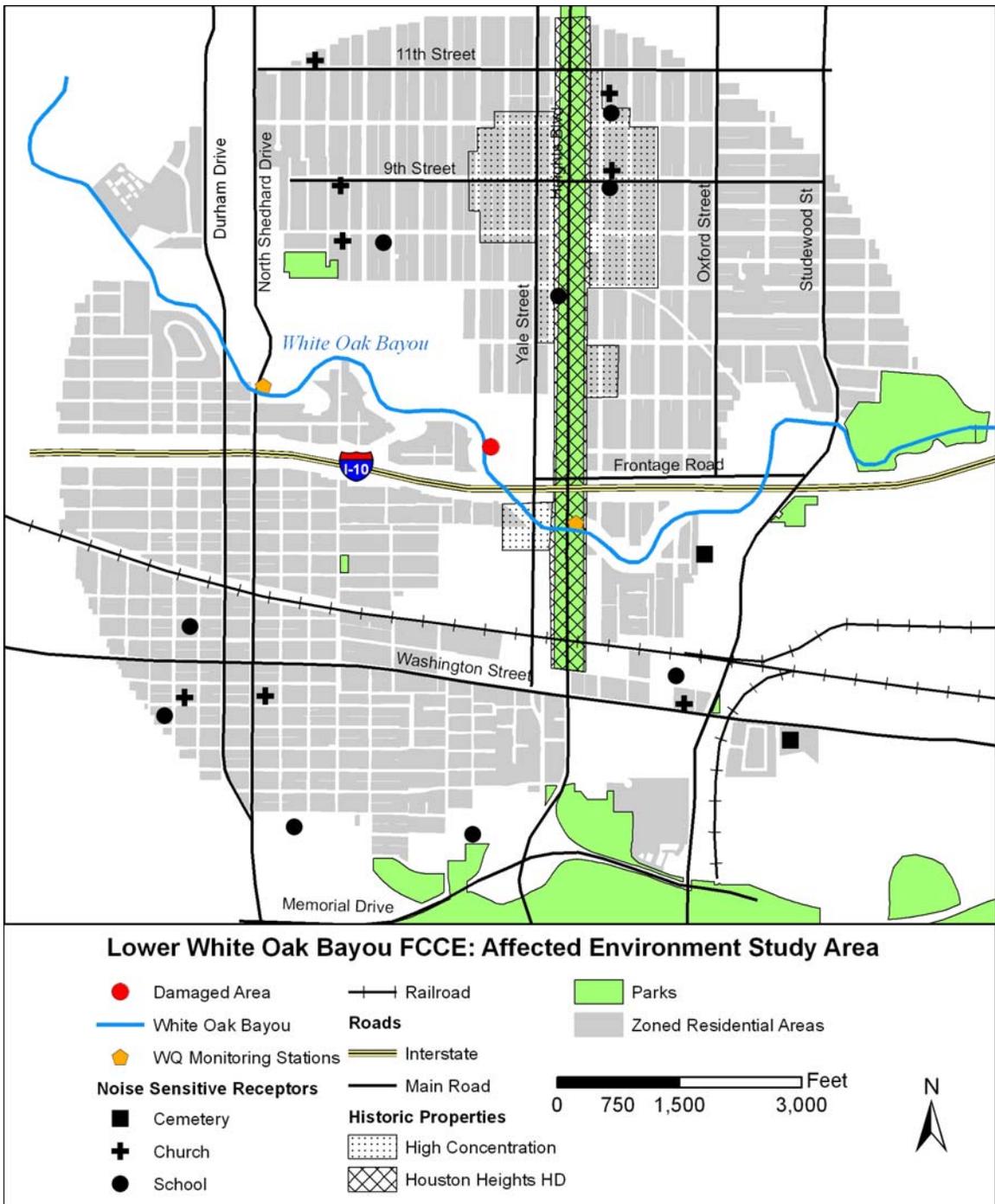


Figure 3. Study Area for the Affected Environment

Houston's climate is classified as humid subtropical. Spring thunderstorms sometimes bring tornadoes to the area. Prevailing winds are from the south and southwest during most of the year, bringing heat across the continent from the deserts of Mexico and moisture from the Gulf of Mexico. During the summer months, it is common for the temperature to reach over 90°F (32°C), with an average of 99 days per year above 90°F (32°C). Winters in Houston are fairly temperate. The average high in January, the coldest month, is 63°F (17°C), while the average low is 45°F (7°C).

White Oak Bayou is located in the Gulf Coast Prairies and Marshes Ecoregion (Gould 1975). This ecoregion is a nearly level plain in a narrow band about 60 miles wide along the Texas coast bordering the Gulf of Mexico from the Sabine River to the Rio Grande.

The study area for the proposed repairs will be limited to a one-mile radius surrounding the damaged area unless otherwise noted in the subsections (Figure 3).

3.2 WATER QUALITY

White Oak Bayou is the only surface water located within the study area. This portion of White Oak Bayou is considered to be above tidal influence and its intended uses are contact recreation and aquatic life (TCEQ 1997). In order to determine if a water body can be used for its intended uses, the Texas Council on Environmental Quality (TCEQ) has established safe levels for seven indicators of water quality (see Table 3-1).

There are two water quality monitoring stations within the study area: Stations 11389 and 80259. Station 11389 is operated by the City of Houston (COH) Health and Human Services and is located at White Oak Bayou and North Shepherd Road. Station 80259 is operated by a Citizen Monitoring Group and is located at White Oak Bayou and Heights Blvd (HGAC 2009). A summary of the monitoring information was gathered from the TCEQ website and is presented in Table 3-1 (TCEQ 2009a).

Table 3-1. White Oak Bayou water quality monitoring

Water Quality Indicators	Unit of Measure	Safe Level	Samples Exceed Safe Levels	
			Station 11389	Station 80259
Cl ⁻¹ (chloride)	mg/L	110	No	No
So ₄ ⁻² (sulfate)	mg/L	65	No	No
TDS ⁴ (total dissolved solids)	mg/L	600	No	No
Dissolved Oxygen	mg/L	3.0	No	No
pH Range	SU	6.5-9.0	No	No
Indicator Bacteria (<i>E. coli</i>)	#/100ml	126/200	Yes	Yes
Temperature	F	92	No	No

Based on the data available, chlorides and sulfates are consistently within appropriate ranges. Dissolved oxygen and water temperature are generally satisfactory. Total dissolved solids are generally low, with few exceptions. The pH range is consistently acceptable. However, the indicator bacteria do present a problem. Based on the data from the monitoring stations, the samples exceed state standards approximately 90 percent of the time. Accordingly, White Oak Bayou is considered impaired and contact recreation in White Oak Bayou is not currently supported.

3.3 AIR QUALITY

The study area is located in an area designated as the Houston-Galveston-Brazoria Intrastate Air Quality Control Region (HGB) by the Environmental Protection Agency

(EPA) (EPA 2007). Ambient air quality is directly related to emissions from man-made sources such as stationary sources (stacks, vents, etc.); emissions from mobile sources such as vehicles, ships, trains, etc.; chemical reactions in the atmosphere such as the formation of ozone; and natural sources such as trees, fires, and wind-blown dust. Since all of these sources must be considered in an assessment of air quality, the EPA has established the Air Quality Control Regions and the National Ambient Air Quality Standards (NAAQS) as a key method for assessing air quality. A summary of the monitoring information was gathered from the TCEQ website and is presented in Table 3-2 (TCEQ 2009b).

Table 3-2. NAAQS attainment for HGB Air Quality Control Region

Pollutant	Averaging Period	Standard	NAAQS	Attainment
Ozone	8-hr	The average of the annual fourth highest daily eight-hour maximum over a three-year period is not to be at or above this level.	76 ppb	Severe Nonattainment
Carbon Monoxide	1-hr	Not to be at or above this level more than once per calendar year.	35.5 ppm	Attainment
	8-hr	Not to be at or above this level more than once per calendar year.	9.5 ppm	Attainment
Sulfur Dioxide	3-hr	Not to be at or above this level more than once per calendar year.	550 ppb (secondary)	Attainment
	24-hr	Not to be at or above this level more than once per calendar year.	145 ppb	Attainment
	Annual	Not to be at or above this level.	35 ppb	Attainment
Nitrogen Dioxide	Annual	Not to be at or above this level.	54 ppb	Attainment
	Annual	The three-year average of annual arithmetic ^c mean concentrations at each monitor within an area is not to be at or above this level.	51 µg/m ³	Attainment
Respirable Particulate Matter (10 microns or less) (PM ₁₀)	24-hr	Not to be at or above this level on more than three days over three years with daily sampling.	155 µg/m ³	Attainment
	Annual	The three-year average of annual arithmetic mean concentrations at each monitor within an area is not to be at or above this level.	51 µg/m ³	Attainment
Respirable Particulate Matter (2.5 microns or less) (PM _{2.5})	24-hr	The three-year average of the annual 98th percentile for each population-oriented monitor within an area is not to be at or above this level.	66 µg/m ³	Attainment
	Annual	The three-year average of annual arithmetic mean concentrations from single or multiple community-oriented monitors is not to be at or above this level.	15.1 µg/m ³	Attainment
Lead	Quarter	Not to be at or above this level.	1.55 µg/m ³	Attainment

The HGB is in attainment with the NAAQS for all criteria pollutants except ozone. The HGB is classified as having “severe” nonattainment with the 8-hour NAAQS for ozone, with an attainment deadline of 2019. Thus by 2019, the area is expected to achieve and maintain attainment with the NAAQS for ozone (TCEQ 2009b).

3.4 NOISE

The study area generally consists of residential neighborhoods, commercial retail shops, and business offices. The noise in these areas tends to range from faint to loud. Additionally, there are noise sources in the study area that generate substantially greater levels of noise. These noise sources are I-10, the other main roads, the Southern Pacific Rail Yard, and the railway. Standard decibel ranges for the existing noise levels in the study area can be found in Table 3-3 (HUD 1985).

Table 3-3. Existing noise levels in the study area

Ambient Neighborhood Noise	Decibel Range	Subjective Evaluation
Residential Neighborhoods	30-70	Faint to Loud
Retail Shops	40-70	Moderate to Loud
Business Offices	50-70	Moderate to Loud
Residential Streets	65-80	Loud to Very Loud
Busy Urban Streets	70-105	Loud to Very Loud
Interstate 10	80-105	Very Loud
Rail Yard	90-110	Very Loud to Deafening
Railway	90-110	Very Loud to Deafening

Noise Sensitive Receptors (NSRs) are those locations where loud noises are not generally acceptable, such as hospitals, schools, churches, cemeteries, or residential neighborhoods. Other NSRs include recreational areas (see Table 3-13) and Historic Districts (discussed in Section 3.14). NSRs in the study area and the distance from the damaged area can be found in table 3-4 (HUD 1985).

Table 3-4. NSRs in the study area and their distance from the damaged area

Type of NSR	Within ¼ mile	Between ¼ and ½ miles	Between ½ and ¾ miles	Between ¾ and 1 mile
Residential Neighborhood	Yes	Yes	Yes	Yes
Schools	0	1	3	5
Churches	0	0	3	5
Cemeteries	0	0	1	1

3.5 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE (HTRW)

A Hazardous, Toxic, and Radioactive Waste (HTRW) preliminary assessment was conducted for the proposed project. The assessment methodology is designed to identify known and potentially unknown HTRW sites that could cause a release to the environment, endanger human health, and impact project costs and schedules. Methodology included a database search, and a review of aerial photos and maps. Databases included in the research included the Superfund, National Pollutant Discharge Elimination System, Resource Conservation and Recovery Act report from the Hazardous Waste database, and the Toxic Release Inventory (<http://134.67.99.122/enviro>). Investigations indicate there are no known HTRW sites in or adjacent to the damaged area where project activities would occur.

3.6 WETLANDS

The National Wetland Inventory (NWI) for the study area was reviewed and no wetlands were present (USFWS 2009a). The lack of wetlands along White Oak Bayou is most likely due to the built urban environment in the study area. When the Lower White Oak Bayou FFCP was built, White Oak Bayou was channelized which likely removed any remaining wetlands.

3.7 WILDLIFE

Wildlife habitat is limited within the watershed due to the urbanized nature of the surrounding areas. However, the riparian areas along White Oak Bayou do provide a corridor for numerous wildlife species. During recent field surveys in 2006 and 2007, the HCFCD reported encountering the species shown in Table 3-5 along Lower White Oak Bayou (HCFCD 2008). These species are all well adapted to urban environments.

Table 3-5. Wildlife observed along Lower White Oak Bayou in 2006 and 2007

Birds			
American Goldfinch (<i>Carduelis tristis</i>)	Carolina Wren (<i>Thryothorus lubovicianus</i>)	Red-bellied Woodpecker (<i>Melanerpes carolinus</i>)	Orange-crowned Warbler (<i>Vermivora celata</i>)
American Robin (<i>Turdus migratorius</i>)	Cedar Waxwing (<i>Bombycilla cedrorum</i>)	House Wren (<i>Troglodytes aedon</i>)	Pileated Woodpecker (<i>Dryocopus ppoleatus</i>)
Belted Kingfisher (<i>Megaceryle alycon</i>)	Downy Woodpecker (<i>Picoides pubescens</i>)	Mourning Dove (<i>Zenaida macroura</i>)	Hermit Thrush (<i>Catharus guttatus</i>)
Blue Jay (<i>Cyanocitta cristata</i>)	Eastern Phoebe (<i>Sayornis phoebe</i>)	Northern Cardinal (<i>Cardinalis cardinalis</i>)	Red-shouldered Hawk (<i>Buteo lineatus</i>)
Blue-gray Gnatcatcher (<i>Poliophtila caerulea</i>)	Great Blue Heron (<i>Ardea herodias</i>)	Northern Mockingbird (<i>Mimus polyglottos</i>)	
Reptiles and Amphibians	Butterflies	Fish	Mammals
Broad-banded Watersnake (<i>Nerodia fasciata confluens</i>)	Common Buckeye (<i>Junonia coenia</i>)	Mosquitofish (<i>Gambusia</i> sp.)	Eastern Cottontail (<i>Sylvilagus floridanus</i>)
Five-lined skink (<i>Eumeces fasciatus</i>)	Hackberry Emperor (<i>Asterocampa celtis</i>)	Alligator Gar (<i>Atractosteus spatula</i>)	Eastern Fox Squirrel (<i>Sciurus niger</i>)
Ground Skink (<i>Scincella lateralis</i>)	Question Mark (<i>Polygonia interrogarionis</i>)	Sunfish (<i>Lepomis</i> sp.)	Mexican Free-tailed bat (<i>Radarida brasiliensis</i>)
Red-eared Slider (<i>Trachemys scripta elegans</i>)	Red Admiral (<i>Vanessa atalanta</i>)		Mollusks
Western Ribbon Snake (<i>Thamnophis proximus proximus</i>)	Texas Crescent (<i>Anthanassa texana</i>)		Bankclimber (<i>Plectomerus dombeyanus</i>)
Southern Leopard Frog (<i>Lithobates sphenoccephalus</i>)			Rock Pocketbook (<i>Arcidens confragosus</i>)
Western Cottonmouth (<i>Agkistrodon piscivorus leucostoma</i>)			

3.8 THREATENED AND ENDANGERED SPECIES

The U.S. Fish and Wildlife Service (USFWS) lists two endangered species as potentially occurring in Harris County (Table 3-6) (USFWS 2009b). A Draft Biological Assessment (BA) was prepared to determine the effects of this project on these species (Appendix C). The BA concluded the two species are highly unlikely to occur in the study area and therefore the project would have no effect on either of the species.

Table 3-6. Effects of the project on Federally-listed Threatened and Endangered Species

Taxon	Common Name	Scientific Name	Federal Status	Occurrence in Study Area	Effect of Project
Birds	Whooping Crane	<i>Grus americana</i>	Endangered	Highly Unlikely	No Effect
Plants	Texas prairie dawn	<i>Hymenoxys texana</i>	Endangered	No potential	No Effect

The State-listed rare, threatened, or endangered species for Harris County are presented in Table 3-7. These species are not likely to occur in the project area and will not be affected by the project; additionally, these species have no Federal standing and will not be considered further.

Table 3-7. State listed Rare, Threatened, or Endangered Species

Taxon	Common Name	Scientific Name	Federal Status	State Status
Amphibians	Houston toad	<i>Bufo houstonensis</i>	LE	E
Birds	White-tailed Hawk	<i>Buteo albicaudatus</i>		T
Birds	Peregrine Falcon	<i>Falco peregrinus</i>	DL	T
Birds	American Peregrine Falcon	<i>Falco peregrinus anatum</i>	DL	E
Birds	Whooping Crane	<i>Grus americana</i>	LE	E
Birds	Bald Eagle	<i>Haliaeetus leucocephalus</i>	DL	T
Birds	Wood Stork	<i>Mycteria americana</i>		T
Birds	Brown Pelican	<i>Pelecanus occidentalis</i>	LE-PDL	E
Birds	Red-cockaded Woodpecker	<i>Picoides borealis</i>	LE	E
Birds	White-faced Ibis	<i>Plegadis chihi</i>		T
Fishes	Creek chubsucker	<i>Erimyzon oblongus</i>		T
Fishes	Smalltooth sawfish	<i>Pristis pectinata</i>	LE	E
Mammals	Red wolf	<i>Canis rufus</i>	LE	E
Mammals	Rafinesque's big-eared bat	<i>Corynorhinus rafinesquii</i>		T
Mammals	Louisiana black bear	<i>Ursus americanus luteolus</i>	LT	T
Plants	Texas prairie dawn	<i>Hymenoxys texana</i>	LE	E
Reptiles	Loggerhead sea turtle	<i>Caretta caretta</i>	LT	T
Reptiles	Green sea turtle	<i>Chelonia mydas</i>	LT	T
Reptiles	Timber/Canebrake rattlesnake	<i>Crotalus horridus</i>		T
Reptiles	Leatherback sea turtle	<i>Dermochelys coriacea</i>	LE	E
Reptiles	Kemp's Ridley sea turtle	<i>Lepidochelys kempii</i>	LE	E
Reptiles	Smooth green snake	<i>Liochlorophis vernalis</i>		T
Reptiles	Alligator snapping turtle	<i>Macrochelys temminckii</i>		T
Reptiles	Texas horned lizard	<i>Phrynosoma cornutum</i>		T

3.10 PRIME AND UNIQUE FARMLANDS

Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses. Unique farmland is land other than prime farmland that is used for the production of specific high value food and fiber crops. The project area is a maintained right-of-way for a flood control project and consists of soil from the Vamont-Urban land complex (NRCS 2009). This soil series is not considered prime farmland (NRCS 2009).

3.11 SOCIOECONOMICS AND DEMOGRAPHICS

As of the 2000 census, there were 13,954 people and 5,931 households in the study area (Table 3-8). The population density of the study area is 4,441 people per square mile. The following information was collected from the Environmental Protection Agency Website and is based on the 2000 census (EPA 2009).

Overall, the racial breakdown for the study area is very similar to both Harris County and the state; however, there is a significantly higher percentage of people who identified themselves as either Hispanic or Other Race in the study area (Table 3-9). The population in the study area tends to be slightly older when compared to the County and State averages (Table 3-10). Also, the population in the study area has a higher percentage of people who did not finish the 9th grade than either Harris County or the state (Table 3-11).

Table 3-8. Comparison of Demographics

Category	Study Area	Harris County, TX	Texas
Total Persons	13,954	3,400,578	20,851,820
Population Density	4441/sq mi	1967/sq mi	80/sq mi
Percent Minority ¹	63%	58%	48%
Persons Below Poverty Level ²	24%	15%	15%
Households in Area ³	5,931	1,205,516	7,393,354
Households on Public Assistance	87	30,506	234,081

¹ see Table 3-8 for further information

² see Table 3-11 for further information

³ see Table 3-12 for further information

Table 3-9. Comparison of the Racial Breakdown

Race	Study Area	Harris County, TX	Texas
White	61.0%	58.6%	71.0%
African-American	8.2%	18.4%	11.4%
Hispanic Origin	52.0%	33.0%	32.0%
Asian/Pacific Islander	1.2%	5.1%	2.7%
American Indian	1.0%	0.4%	0.5%
Other Race	25.4%	14.4%	11.8%
Multiracial	3.2%	3.0%	2.5%

Approximately one percent of the households in the study area are on public assistance. In contrast, approximately two percent of the households in Harris County and three

percent of the households in Texas are on public assistance. However, people in the study area tend to have a lower income than people in Harris County and in the state (Table 3-12). There is a substantially higher level of renter occupied households in the study area than in Harris County or the state (Table 3-13).

Table 3-10. Comparison of the Age Breakdown

	Study Area	Harris County, TX	Texas
Child 5 Years or Less	7.8%	9.8%	9.3%
Minors 6 to 17 Years	14.4%	19.1 %	18.9%
Adults 18 to 64 Years	69.6%	63.7%	71.8%
Seniors 65 Years and Older	8.2%	7.4%	9.9%

Table 3-11. Comparison of the Educational Attainment

	Study Area	Harris County, TX	Texas
Less than 9 th Grade	22.7%	12.7%	12.1%
9 th – 12 th Grade	15.3%	13.9%	13.6%
High School Diploma	14.0%	22.7%	26.2%
Some College/2yr.	17.6%	22.4%	23.6%
B.S./B.A. or more	30.4%	28.3%	24.5%

Table 3-12. Comparison of Income Levels

	Study Area	Harris County, TX	Texas
Less than \$15,000	29.3%	15.0%	16.8%
\$15,000 - \$25,000	20.1%	12.6%	13.5%
\$25,000 – \$50,000	20.4%	29.4%	30.0%
\$50,000 - \$75,000	15.6%	18.4%	18.5%
Greater than \$75,000	13.2%	24.8%	21.3%

Table 3-13. Comparison of Households (Rent vs. Owner Occupied)

	Study Area	Harris County, TX	Texas
Owner Occupied	33.8%	55.3%	63.6%
Renter Occupied	66.2%	44.7%	36.4%

3.12 RECREATIONAL RESOURCES

There are eight parks within the study area (Table 3-14). All of these parks and their distance from the damaged area was gathered from the City of Houston Parks and Recreation Department and is provided in Table 3-13. Neighborhood parks tend to range from 1 to 15 acres and have a service area of ½ mile; they typically provide playgrounds, open space, and walking trails. Community parks range in size from 16 to 150 acres and have a service area of up to five miles; these parks typically provide the services found in neighborhood parks plus picnic areas, game courts, and parking areas. Regional parks tend to be large than 150 acres and serve a large region; these parks tend to provide a larger range of services to a variety of interests (CHPRD 2008).

Table 3-14. Recreational Resources within the study area

Park Name	Type of Park	Acres	Distance from Damaged Area
Heights Blvd. Park	Historic and Cultural Linear Park	17	Within ¼ mile
West End Park	Neighborhood Park	0.5	Between ¼ and ½ miles
Lawrence Park	Neighborhood Park	4	Between ¼ and ½ miles
Studemont Spaceway	Neighborhood Park	3	Between ¾ and 1 mile
Cleveland Park	Community Park	6	Between ¾ and 1 mile
Knox Park	Plaza/Square	0.5	Between ¾ and 1 mile
Stude	Regional Park	32	Between ¾ and 1 mile
Spotts Park	Community Park	16	Between ¾ and 1 mile
Tinsley Park (small portion)	Linear Park	150	Between ¾ and 1 mile

3.13 TRAVELWAYS AND TRAFFIC

I-10, one of the main east-west travel ways through Houston, is located within the study area. Other main roads in the study area consist of: Washington St, North Shepherd Dr, Durham Dr, Heights Blvd, Studewood St, the I-10 Frontage Road, 9th St, 11th St, Oxford St, Yale St, and Memorial Drive. In addition, there is a Southern Pacific Rail Yard and associated railways within the study area approximately ½ mile south of the damaged area.

A search was made to determine the proximity of airports to the project site. There are no airports located within five statute miles of the proposed repairs. The nearest airport is George Bush International Airport, located more than 20 miles away.

3.14 CULTURAL RESOURCES

The study area contains one of the first planned suburbs in Texas; the Historic District called Houston Heights. Houston Heights has retained its architectural and civic identity to an unusual degree. This has been accomplished in spite of its location in one of the fastest growing cities in the United States. The Heights presents a Whitman's Sampler of turn-of-the-century architectural styles. Several notable late-Victorian mansions and substantial early 20th-century public, ecclesiastical, and commercial buildings serve as the anchors of the neighborhood. Nevertheless, the real strength of the Heights rests in its wide array of essentially vernacular, middle-class, and domestic architecture from the period between 1893 and 1932. Additionally, the vegetation in the Heights is exceptional, and it contributes to the sense of community.

4.0 ENVIRONMENTAL CONSEQUENCES OF PREFERRED ALTERNATIVE

4.1 IMPACTS TO THE STUDY AREA

The proposed repairs are of such limited nature and extent they don't have the potential to affect the overall climate, topography, soils, or urban nature of the study area. Any impacts in the study area would be minor, temporary, and would quickly dissipate upon completion of the work. Impacts to the resources are presented in the following subsections.

4.2 IMPACTS TO WATER QUALITY

In the short term, during the period when the repairs are being conducted, earth moving activities may result in minor increases in turbidity in the immediate vicinity of the damaged area. After repairs are completed, the sediments would stabilize rapidly. The proposed repairs would not affect any of the water quality indicators. As discussed in Section 3.2, TCEQ has waived Section 401 of the Clean Water Act (Appendix A)

4.3 IMPACTS TO AIR QUALITY

The project area is located in the Houston-Galveston-Brazoria (HGB) Consolidated Metropolitan Statistical Area (CMSA), which is classified as "severe" non-attainment with the 8-hour NAAQS for ozone. General conformity under the Clean Air Act, Section 176 has been reviewed for this project. The requirements of this rule are not applicable to this project because it is exempt under 40 CFR 93.153(e)(1) and 30 TAC 101.30(c)(5)(A) since it is impractical to prepare the conformity analysis which might otherwise be required and this project cannot be delayed due to the overriding concerns for public health and welfare, especially in view of the upcoming hurricane season. Furthermore, given the complexities of repair execution, a determination pursuant to 40 CFR 93.153(e)(2) and 30 TAC 1201.30(c)(5)(B) has been signed that extends this exemption an additional six months, through March 13, 2010. Signed determinations documenting these decisions are included in Appendix D.

4.4 NOISE IMPACTS

Noise associated with the construction equipment presents a short-term impact during the construction phase. The standard decibel ranges for common construction equipment likely to be used during the repairs was gathered from the EPA and is presented in Table 4-1 (EPA 1972).

Table 4-1. Decibel ranges for standard construction equipment

Equipment	Decibel range	Equipment	Decibel range
Compactors (rollers)	70-75	Scrapers, graders	80-95
Front Loaders	70-85	Concrete mixers	75-85
Backhoes	70-95	Trucks	85-95

The standard decibel ranges for the construction equipment is substantially lower than the decibel ranges along I-10 (refer to Table 3-3). The repairs may periodically and temporarily disturb wildlife as described in Section 4.7. Construction activities would be limited to operating between 8 AM and 5 PM. No long-term impacts would occur as a result of noise. While the construction equipment will temporarily increase the level of noise in the community, it would be temporary, only occur during the daytime hours, and be well within accepted daytime standards.

4.5 IMPACTS TO HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE (HTRW)

Based on the findings of the HTRW survey, the probability of increased project cost or lost time from discovery and remediation of any contaminated materials during activities to repair the hurricane flood protection system is considered low. Information compiled by this assessment indicates additional HTRW investigations are not warranted at this time.

4.6 IMPACTS TO WETLANDS

There are no wetlands within the study area. Therefore, the project will not impact wetlands.

4.7 IMPACTS TO WILDLIFE

The project would result in temporary, minor disturbances to wildlife in and near the damaged area while the repairs are being conducted. The proposed repair work would occur within the footprint of the existing Lower White Oak FFCP which has been previously disturbed and undergoes routine inspection and maintenance activities. The maintenance activities produce disturbances similar to those expected from the proposed repair work. Species that do not tolerate disturbances resulting from the repair would be temporarily displaced.

4.8 IMPACTS TO FISHERIES AND ESSENTIAL FISH HABITAT

There are no fisheries or essential fish habitat within the study area. Therefore, the project will not impact either fisheries or essential fish habitat.

4.9 IMPACTS TO THREATENED AND ENDANGERED SPECIES

The project area does not contain preferred habitat for the Federally-listed Threatened or Endangered species. The proposed repair work is minor, short-term, and will occur within the footprint of the existing project. This footprint has been previously disturbed and undergoes routine inspection and maintenance. These activities produce disturbances similar to those expected from the proposed repair work. For these reasons, the proposed action is expected to have no effect on any federally-listed threatened or endangered species or their critical habitat (see Appendix C: Biological Assessment).

4.10 IMPACTS TO PRIME AND UNIQUE FARMLANDS

There are no prime or unique farmlands within the study area. Therefore, the project will not impact either prime or unique farmlands.

4.11 IMPACTS TO SOCIOECONOMICS AND DEMOGRAPHICS

The proposed repairs are of such limited nature and extent, that they do not have the potential to alter the demographics or economy of the study area or beyond. While the project area does contain a higher percentage of minority (61%) and low-income (49%) families than Harris County (58% minority and 28% low-income), there are no significant adverse impacts associated with the proposed repairs. Therefore, there are no Environmental Justice concerns.

4.12 IMPACTS TO RECREATIONAL RESOURCES

The proposed repairs are of such limited nature and extent, that they don't have the potential to affect any of the recreational resources in the study area.

4.13 IMPACTS TO TRAVELWAYS AND TRAFFIC

The damaged area can be most directly accessed from I-10, the I-10 Frontage Road, and Yale Street. These are all heavily travelled roads and any increase in traffic would be minor and temporary. Impacts to traffic from the proposed project would be limited to construction equipment accessing and departing from the damaged area. The proposed project would not impact the Southern Pacific Rail Yard or railway.

The nearest airport is more than 20 miles away from the project area, therefore the risk of this project affecting aircraft-wildlife strikes is considered to be negligible, and no further coordination is required.

4.14 IMPACTS TO CULTURAL RESOURCES

The study area has been so extensively urbanized and White Oak Bayou (within the study area) has been completely channelized that there is no potential for prehistoric sites to exist in the study area. The damaged area is in a location that was channelized and has been continually maintained.

The historic buildings and vegetation associated with the Houston Heights Historic District, are over a block away from the damaged area. Other Historic Properties within the study area are, at a minimum, a block away from the damaged area. Repairs at the damaged area do not have the potential to affect the Houston Heights Historic District or the other Historic Properties.

5.0 MITIGATION

The proposed project would not impact wetlands or riparian forest, and there would not be any significant impacts to other sensitive resources. Therefore, compensatory mitigation would not be required.

6.0 CUMULATIVE IMPACTS

Residences and small commercial businesses dominate the study area. This community has influenced the study area's land use history. Past and present actions in the study area include: Lower White Oak FFCP, the urban development of the area, the construction of I-10, and the Southern Pacific Rail Yard and railway.

Reasonably foreseeable future actions consist of the continued maintenance of the Lower White Oak FFCP, I-10 and other roads, and the Southern Pacific Rail Yard and railway. The Harris County Flood Control District (HCFCD) will continue to maintain the Lower White Oak FFCP.

As discussed in Section 4.0, the impacts associated with the proposed repairs are both minor and temporary. Therefore, the impacts from the proposed repairs are not significant even when considered cumulatively with impacts from past, present, and reasonably foreseeable future projects.

7.0 COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS

This EA has been prepared to satisfy the requirement of all applicable environmental laws and regulations, and has been prepared in accordance with the Council on Environmental Quality's implementing regulations for the National Environmental Policy Act (NEPA), 40 CFR Parts 1500-1508, and USACE Regulation ER 200-2-2, Environmental Quality: Procedures for Implementing NEPA. The planning and implementation of the proposed project is consistent with the U.S. Army Corps of Engineers' Environmental Operating Principles.

The following is a list of applicable environmental laws and regulations that were considered in the planning of this project and the status of compliance with each:

National Environmental Policy Act (NEPA): This EA has been prepared in accordance with Council on Environmental Quality regulations for implementing NEPA. The physical, natural, social, and cultural environmental consequences of the recommended plan have been analyzed in accordance with the Act and presented in this assessment.

Fish and Wildlife Coordination Act of 1958, as Amended: The construction of the Lower White Oak FFCP was coordinated in an Environmental Impact Statement titled Buffalo Bayou and Tributaries, Texas and dated May 1988 (USACE 1988). No additional coordination is required since the proposed repairs will stay within the original footprint. However both the U.S. Fish and Wildlife Service and Texas Parks & Wildlife

Department will have the opportunity to comment on the proposed repairs. Comments provided by the USFWS and the TPWD on fish and wildlife resources will be taken into consideration.

National Historic Preservation Act of 1966, as amended: This project was determined by a USACE Staff Archeologist to be of such limited nature that it does not have the potential to cause effects on historic properties even if present in the study area. This project is in compliance with the National Historic Preservation Act pursuant to 36 CFR 800.3(a).

Endangered Species Act, as amended: The USACE has prepared a draft Biological Assessment (BA) addressing all Federally listed threatened or endangered species in Harris County (see Appendix C). This draft BA will be provided to the U.S. Fish and Wildlife Service (USFWS) for review and comment. The BA concluded that the proposed project would have no effect on any Federally-listed threatened or endangered species or critical habitat.

Clean Air Act of 1972, as amended: General Conformity under the Clean Air Act, Section 176 has been evaluated for this project according to the requirements of 40 CFR 93, Subpart B. The requirements of this rule are not applicable to this project because it is exempt under 40 CFR 93.153(e)(1) and 30 TAC 101.30(c)(5)(A), since it is impractical to prepare the conformity analysis which might otherwise be required and the action cannot be delayed due to overriding concerns for public health and welfare, especially in view of the upcoming hurricane season.

On February 24, 2009 a Clean Air Act General Conformity Record of Non-Applicability was issued by the Corps of Engineers, Galveston District, that exempted this project. In light of the complexities of execution of the emergency repairs, this exemption has been extended for an additional six months, through March 13, 2010, pursuant to 40 CFR 93.153(e)(2) and 30 TAC 101.30(c)(5)(B). This project is not considered regionally significant under 40 CFR 93.153(i).

Clean Water Act of 1977, as amended: The Texas Commission on Environmental Quality has issued a waiver for Section 401 of the Clean Water Act for the proposed project (see Appendix A).

Executive Order 11990 – Protection of Wetlands: The Lower White Oak FFCP project footprint is entirely within the footprint of the previously existing, previously disturbed areas of the project footprint and will not result in new impacts to wetlands; therefore the project is in compliance with E.O. 11990.

Executive Order 12898 – Environmental Justice: The proposed project would not have a disproportionate adverse impact on minority or low-income population groups within the project area.

CEQ Memorandum Dated August 11, 1980 – Prime or Unique Farmlands: The proposed project will not impact any lands considered prime or unique.

Executive Order 11988 Floodplain Management: The proposed project would not induce increased flooding in developed areas and would not contribute to increased future flood damages.

Noise Control Act: Repair of the damaged area will increase noise levels during construction due to heavy equipment, work crew activities and cement trucks. Project activities will be limited to the period between 8AM and 5PM and won't create a disturbance during nighttime hours. Therefore, the project will be compliant with this Act.

Resource Conservation and Recovery Act (RCRA): This Federal law governs the management and disposal of hazardous and non-hazardous wastes. RCRA may impose substantial requirements on Federal projects that manage even small amounts of hazardous waste. A review was conducted for the project area for RCRA material and none was located.

Magnuson-Stevens Fishery Conservation Management Act: Congress enacted amendments to the Magnuson-Stevens Fishery Conservation and Management Act in 1996 that established procedures for identifying Essential Fish Habitat (EFH) and required interagency coordination to further the conservation of federally managed fisheries. Rules published by the NMFS (50 CFR 600.805 through 600.930) specify that any Federal agency that authorizes, funds or undertakes, or proposes to authorize, fund or undertake an activity that could adversely affect EFH be subject to the consultation provisions of the act. No impacts to living marine resources or EFH would occur as a result of the project. EFH consultation is not required.

Coastal Zone Management Act of 1972: This Act requires that all land-use changes in the project area be conducted in accordance with approved state coastal zone management programs. The project is not located within the Texas Coastal Management Program zone.

Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA): As amended by Superfund Amendments and Reauthorization Act of 1986, CERCLA provides for liability, compensation, cleanup, and emergency response of hazardous substances released into the environment and cleanup of inactive hazardous substances disposal sites. 42 U.S.C. 9620 provides that Federal facilities and agencies must comply with the requirements of CERCLA, including the sale or transfer of real property must include a declaration of the type, quantity and time for which any hazardous substance that was stored, released or disposed on the property. A review was conducted for CERCLA material and none is located in or around the damaged area.

Memorandum of Agreement (MOA) with the FAA to Address Aircraft-Wildlife Strikes - This MOA was executed between the Federal Aviation Administration, the U.S. Air

Force, the U.S. Army, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, and the U.S. Department of Agriculture: Through this MOA, the agencies establish procedures necessary to coordinate their missions to more effectively address existing and future environmental conditions contributing to aircraft-wildlife strikes throughout the United States. These efforts are intended to minimize wildlife risks to aviation and human safety, while protecting the Nation's valuable environmental resources. There are no airports located within five statute miles of the proposed repairs. Therefore, the risk of aircraft-wildlife strikes is considered to be negligible, and no further coordination is required.

8.0 CONCLUSIONS

As a result of public and agency review, two letters were received commenting on the proposed project, one from Texas Parks and Wildlife Department and one from the U.S. Fish and Wildlife Service (USFWS). The USFWS raised two issues: that all demolished materials should be removed from the site and placed in an approved disposal site and that demolition should be confined to the project footprint as much as possible. The USACE shall dispose of all demolished materials in an approved disposal site and the USACE shall take all prudent and reasonable steps to confine demolition activities to the project footprint (see Appendix A for the complete letters and responses). As presented in Section 4.0 – Environmental Consequences of Selected Alternative, the proposed project could result in temporary and minor impacts to the environment. The following conclusions summarize the findings of the EA:

- **Water Quality:** There would be no long-term impact to water quality from the proposed repairs.
- **Air Quality:** Emissions from the proposed project would not be locally or regionally significant.
- **Noise:** Implementation of the proposed action would result in temporary noise impacts to local residents from construction equipment however the impacts would occur during the day only and would not be significant.
- **HTRW:** There would be no hazardous, toxic, or radioactive waste sites impacted by the proposed project or released by the project.
- **Wetlands:** There are no wetlands in the study area.
- **Wildlife:** Wildlife may be temporarily displaced by project activities, however wildlife would find identical habitat immediately upstream and downstream of the project footprint.
- **Fisheries and Essential Fish Habitat:** There are no fisheries or essential fish habitat in the study area.
- **Threatened and Endangered Species:** There would be no effect on federally-listed threatened or endangered species as a result of the proposed project.
- **Prime and Unique Farmland:** There is no prime or unique farmland in the study area.
- **Socioeconomics and Demographics:** the project would not impact socioeconomic resources or demographics either locally or regionally.

- Environmental Justice: there are no significant adverse impacts from this project; therefore there are no Environmental Justice issues.
- Recreation: Recreation resources would not be impacted by this project.
- Travel Ways and Traffic: This project will not impact roads or railways. Any impacts to traffic would be limited to a few very heavily travelled main roads and would be minor and temporary.
- Cultural Resources: The project has no potential to affect Historic Properties.

In summary, no significant or adverse impacts, singularly or cumulatively, to physical, natural, social, or cultural environmental resources are expected to occur as a result of implementation of this project. Therefore, the preparation of an Environmental Impact Statement is not required.

9.0 LITERATURE CITED

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Appendix A - Agency Coordination

Buddy Garcia, *Chairman*
Larry R. Soward, *Commissioner*
Bryan W. Shaw, Ph.D., *Commissioner*
Mark R. Vickery, P.G., *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

Ms. Carolyn Murphy
U.S. Army Corps of Engineers
Galveston District CESWG-PE-RE
P.O. Box 1229
Galveston, Texas 77553-1229

Re: USACE Emergency Repair and Restoration to Hurricane Ike Damaged Infrastructure.

Dear Ms. Murphy:

This letter is in response to the Texas Commission on Environmental Quality (TCEQ) review of preliminary information regarding the Emergency repairs to Clear Creek Federal Flood Control Project (FCP) Second Outlet Structure, White Oak Bayou FCP, The Galveston Seawall and Groins, and the Port Arthur, Freeport, and Texas City and Vicinity Hurricane and Shore Protection Projects. As currently proposed, the work will only restore the projects to pre-storm levels, with no improvements or expansion of the existing projects.

Recognizing that the impacts from the proposed work are minor and temporary, and in order to expedite these Hurricane Ike recovery efforts, the TCEQ waives the Clean Water Act Section 401 certification for these projects.

If you require additional information or further assistance, please contact Mr. Mark Fisher, Water Quality Assessment Section, Water Quality Division (MC-150), at (512) 239-4586.

Sincerely,

A handwritten signature in cursive script that reads "L'Oreal W. Stepney".

L'Oreal W. Stepney P.E., Director
Water Quality Division

LWS/MF/sp



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Division of Ecological Services
17629 El Camino Real #211
Houston, Texas 77058-3051
281/286-8282 / (FAX) 281/488-5882



June 10, 2009

Carolyn Murphy
Department of the Army
Galveston District, Corps of Engineers
P.O. Box 1229
Galveston, Texas 77551

Dear Ms. Murphy,

Thank you for the opportunity to review the Notice of Availability for the U.S. Army Corps of Engineers, Galveston District Environmental Assessment for Emergency Repairs to Clear Creek Second Outlet Structure, Harris County, Texas and White Oak Bayou Federal Flood Control Project, Harris County, Texas, dated June 2, 2009.

The U.S. Fish and Wildlife Service (Service) has reviewed the draft Environmental Assessments for both projects. Under the Endangered Species Act, when a call of "no effect" is made on a project, it is not necessary for the Service to respond or provide concurrence. The responsibility of determining a "no effect" finding lies with the project proponent and should be well documented in your project files. In the event the scope of the project changes, or additional information on the distribution of trusted species or designated critical habitat becomes available, threats to listed species should be assessed again and a determination made accordingly. After review of the proposed project, the Service recommends the following:

- All demolished materials, including concrete materials should be removed from the site and placed in an approved disposal site. Any material left at the site may be hazardous to the fish and wildlife in the area.
- Demolition should be confined to the project footprint as much as possible. In the event any debris enters a channel or water body, the material should be removed immediately.

The Service understands the need for the emergency repair work at these two sites and appreciates the opportunity to comment on these projects in order to minimize impacts to fish and wildlife resources in the area. The Service encourages early coordination on all projects and looks forward to coordination on this and others in the future. Please contact staff biologist Donna Anderson at 281/286-8282 if you have questions concerning these recommendations.

Sincerely,

Stephen D. Parris
Field Supervisor, Clear Lake ES Field Office

Response to Comments

Thank you for your comments.

The USACE shall make sure all demolished materials, including concrete materials are removed from the site and placed in an approved disposal site. No material shall be left at the site.

The USACE shall take all reasonable and prudent steps to confine demolition activities to the project footprint. If any debris enters a channel or water body, the materials shall be removed immediately.



Life's better outside.™

June 11, 2009

Ms. Murphy
U.S. Army Engineer District, Galveston
CESWG-PE-PR
P.O. Box 1229
Galveston, Texas 77553-1229

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Rio Grande City

Karen J. Hixon
San Antonio

Margaret Martin
Boerne

John D. Parker
Lufkin

Lee M. Bass
Chairman-Emeritus
Fort Worth

Carter P. Smith
Executive Director

Re: Draft Environmental Assessment for Emergency Repairs to the White Oak Bayou Federal Flood Control Project, Harris County, Texas

Dear Ms. Murphy,

The Texas Parks and Wildlife Department has reviewed the proposed project plans. The work as described should not have significant adverse impact on fish and wildlife resources.

Questions can be directed to Mike Morgan at (281) 534-0146 or Jamie Schubert at (281) 534-0135 in Dickinson, Texas.

Sincerely,

Rebecca Hensley
Regional Director, Ecosystem Resources Program
Science and Policy Branch
Coastal Fisheries Division

RH:WJS:MNM

Response to Comments

Thank you for you comments.

Appendix B - Public Notice and Coordination



DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

June 2, 2009

NOTICE OF AVAILABILITY

U.S. ARMY CORPS OF ENGINEERS, GALVESTON DISTRICT ENVIRONMENTAL ASSESSMENT FOR EMERGENCY REPAIRS TO

CLEAR CREEK SECOND OUTLET STRUCTURE, HARRIS COUNTY, TEXAS AND WHITE OAK BAYOU FEDERAL FLOOD CONTROL PROJECT, HARRIS COUNTY, TEXAS

PURPOSE

This notice is being distributed to interested State, Federal, and local agencies, private organizations, news media, and individuals in order to assist in collecting facts and recommendations concerning proposed rehabilitation and repair work that will restore the Clear Creek Second Outlet Structure and the White Oak Bayou Federal Flood Control Projects to pre-storm conditions following damages sustained from Hurricane Ike, which made landfall in northern Galveston County on September 13, 2008. The proposed rehabilitation and repair work is necessary to restore the projects to their pre-storm levels of protection and safety consistent with current designs and sound engineering principles. The proposed work will not result in an expansion of the existing projects.

NEED FOR WORK

Hurricane Ike made landfall in northern Galveston County on September 13, 2008. Before making landfall the hurricane was a Category 4 storm, as measured on the Saffir-Simpson Scale. Wind speeds decreased as it approached land, and the storm was classified as a Category 2 storm when it reached land. The magnitude of the storm surge was more characteristic of a Category 3 or 4 storm than a Category 2 storm. According to the National Hurricane Center, Ike was a very large hurricane with hurricane force winds extending 120 miles from the center and tropical storm force winds extending 275 miles. Hurricane Ike's unprecedented size, which at one point was the largest Atlantic hurricane ever recorded, caused extensive damage. Ike ranks as the third costliest storm in U.S. history, causing approximately \$27 billion

in property damage. The proposed work would be conducted under authority of Public Law 84-99 for Flood Control and Coastal Emergencies. Engineer Regulation (ER) 500-1-1 eligibility requirements for the work are met under the criteria for extraordinary storm and significant amount of damage.

The combined storm surge and wave action from Hurricane Ike caused extensive damage to the Clear Creek Second Outlet Structure and the White Oak Federal Flood Control Project. The proposed rehabilitation work will include repairs that will restore these projects to pre-storm conditions. If these projects are left in their current condition, the risk of structural failure and potential damages the projects may sustain during future significant storm events could threaten the communities and properties they protect.

PROJECT DESCRIPTION AND LOCATION

Clear Creek Flood Control Project Second Outlet Structure, Harris County, Texas

The Clear Creek FCP is located along Clear Creek, in Galveston, Harris, and Brazoria Counties. The 31 mile earthen channel begins at the mouth of Clear Lake on Galveston Bay. Included in the project was the construction of a gated Second Outlet Structure located immediately upstream of State Highway 146 in Seabrook, in Harris County, Texas. The Second Outlet, which normally remains closed, was built to accommodate the rise in water levels within Clear Lake caused from the increased flood flows from Clear Creek as a result of upstream channel modifications.

White Oak Bayou Federal Flood Control Project, Harris County, Texas

The White Oak Bayou FCP is located along White Oak Bayou, in northwest Houston, Harris County, Texas. The project was designed to provide protection to the project area from flooding events. The project consisted of clearing, straightening, enlarging, and partial concrete lining of the trapezoidal, earthen channel along 10.7 miles between the confluence of Buffalo and White Oak Bayous to Cole Creek.

DESCRIPTION OF REHABILITATION AND REPAIR WORK

Clear Creek Flood Control Project Second Outlet Structure

Following Hurricane Ike's landfall, the Second Outlet Structure was found to have significant damage at various locations as a result of the combined storm surge, wave action, storm debris and persistent high winds. Damage to the project included damage to the outlet structure access roadway, facility building, structure catwalks, handrails, and gate stem covers. Repairs will restore the Second Outlet Structure to its pre-storm condition. Repair to pre-storm conditions would include: repair of the roadway base and surface to current engineering design standards; replacement of the foundation material under the facility

building; replacement of the 350-gallon solid waste container; repair and replacement of the electrical weatherhead, conduit and wires on the side of the building; replacement and repair of the damaged handrails and catwalk supports and anchors on the structure; and cleaning and re-greasing of the gate stems and replacement of the gate stem covers. The Second Outlet Structure, channel and facilities are shown in Figure 1.



Figure 1. Clear Creek Flood Control Project Second Outlet Structure.

White Oak Bayou Flood Control Project

The White Oak Bayou FCP area received 16.09 inches of rain between September 13 and 15, 2008 from Hurricane Ike. This rain event resulted in severe damage to the concrete lining in the area near Yale and Interstate 10; there is now a substantial risk of slope failure to both the concrete-lined slope and the uphill earthen slope (Figure 2). The U.S. Army Corps of Engineers is proposing to repair these damages, returning the project to pre-storm conditions.

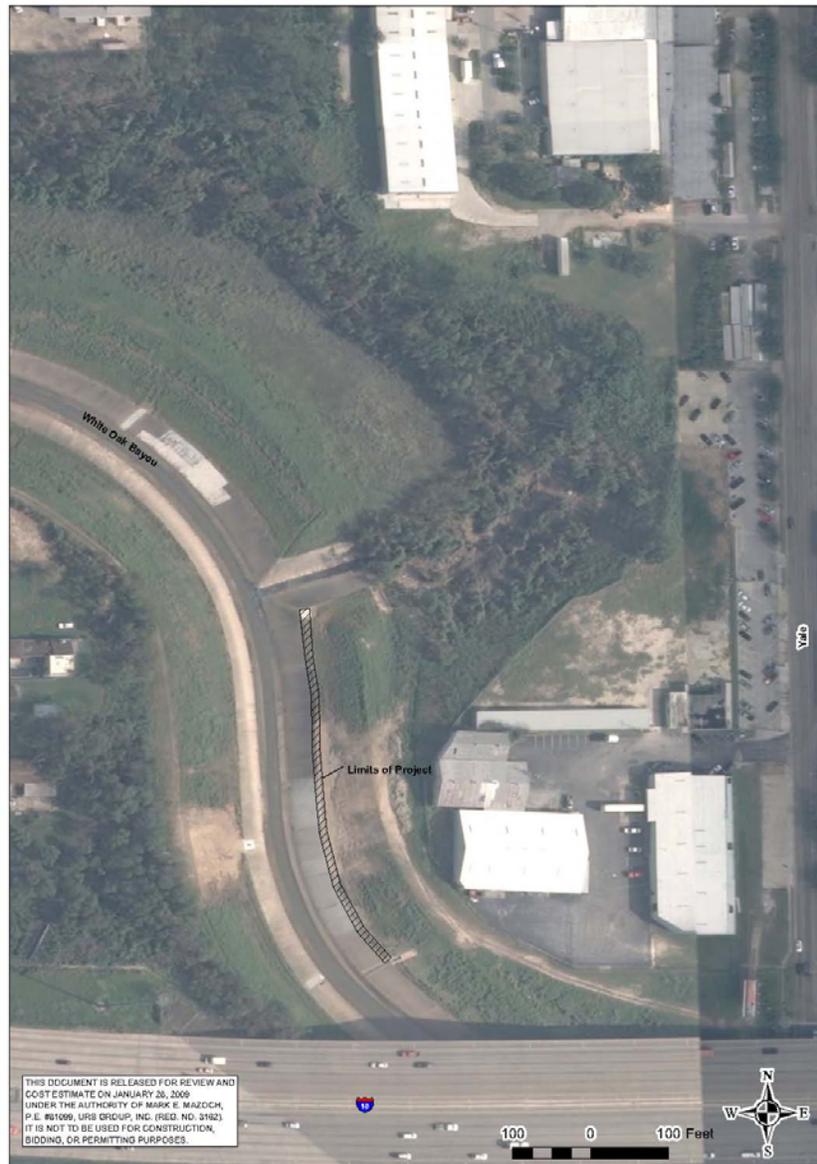


Figure 2. White Oak Bayou Flood Control Project

COMPLIANCE WITH LAWS AND REGULATIONS

Draft Environmental Assessments (EAs) are being coordinated with the U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and other Federal, state, and local agencies. Consultation has been initiated with the USFWS and NMFS in compliance with the Endangered Species Act. The Biological Assessments (Appendix B of the Draft EAs) conclude that the projects are not likely to adversely affect the threatened or endangered species in the project areas.

The EAs also initiate Essential Fish Habitat (EFH) consultation requirements of the Magnuson-Stevens Fishery Conservation and Management Act. The initial determination is that the proposed actions will not have adverse impacts on EFH or federally-managed fisheries in the Gulf of Mexico. The final determinations relative to project impacts and the need for mitigation measures is subject to review by and coordination with the NMFS.

The proposed rehabilitation and repair work will also be evaluated, as appropriate, with regard to the requirements of Section 404(b)(1) of the Clean Water Act (CWA). The Texas Council on Environmental Quality (TCEQ) has waived Clean Water Act Section 401 Certification for these projects in recognition that impacts from the proposed work are minor and temporary in nature, and to expedite Hurricane Ike recovery efforts. It should be noted that this project would qualify under Corps of Engineers Nation Wide Permit 3, and as such, would require no further CWA coordination.

It is also our preliminary determination that the proposed actions are consistent with the Texas Coastal Management Program (TCMP) to the maximum extent practicable.

A record of non-applicability has been issued for general conformity under the Clean Air Act (CAA), Section 176 according to the requirements of 40 CFR 93, Subpart B. The requirements of this rule are not applicable to these projects because the projects are exempt actions under 40 CFR 93.153(e)(1), 30 TAC 101.30(c)(5)(A), 40 CFR 93.153(e)(2), and 30 TAC 101.30 (c)(5)(B).

The proposed activities will be coordinated with the State Historic Preservation Officer (SHPO). Our initial determination is that the proposed actions do not have the potential to effect historic properties.

The following is a partial list of Federal, State, and local agencies with which this activity is being coordinated:

U.S. Environmental Protection Agency, Region 6
U.S. Department of Commerce
U.S. Department of the Interior
Texas Historical Commission
Texas Parks and Wildlife Department
Texas Commission on Environmental Quality
Texas General Land Office
Coastal Coordination Council
Texas Department of Transportation
Texas Water Development Board

EVALUATION FACTORS

The decision whether to proceed with these repair projects will be based on an evaluation of the probable impact of the proposed activities on the public interest. That decision will reflect the national concern for

protection and utilization of important resources as well as public and environmental safety and economic concerns. The benefit, which reasonably may be expected to accrue from the proposals, must be balanced against its reasonably foreseeable detriments. All factors, which may be relevant to the proposal, will be considered. The proposed repair projects will proceed unless found contrary to the overall public interest.

ENVIRONMENTAL DOCUMENTATION

It is anticipated that Environmental Assessments and Findings of No Significant Impact will fulfill the requirements of the National Environmental Policy Act. Single copies of these documents will be available by written request to the address below. The draft EAs are also available online for review in the "Hot Topics" section at: <http://www.swg.usace.army.mil/>.

PUBLIC COMMENT

Persons desiring to express their views or provide information to be considered in evaluating the impact of these repair projects are requested to mail their comments within 10 days of the date of this notice to:

District Engineer
U.S. Army Engineer District, Galveston
ATTN: CESWG-PE-PR, Ms. Carolyn Murphy
P.O. Box 1229
Galveston, Texas 77553-1229

or email at: carolyn.e.murphy@usace.army.mil; or phone 409-766-3044.

The comments should make specific reference to the individual projects to which they pertain. Any person who has an interest which may be affected by this action may request a public hearing. The request must be submitted in writing within 10 days of the date of this notice and must clearly set forth the interest which may be affected and the manner in which the interest may be affected by this activity. Any questions concerning the proposed action may be directed to Ms. Carolyn Murphy at (409) 766-3044, or the email address above.



Richard Medina
Chief, Planning Branch

Appendix C – Biological Assessment

**BIOLOGICAL ASSESSMENT FOR FEDERALLY-LISTED
THREATENED AND ENDANGERED SPECIES
FOR REHABILITATION OF
DAMAGED FLOOD CONTROL WORKS
LOWER WHITE OAK BAYOU
FEDERAL FLOOD CONTROL PROJECT
HARRIS COUNTY, TEXAS**

1.0 INTRODUCTION

1.1 PURPOSE OF THE BIOLOGICAL ASSESSMENT

This Biological Assessment (BA) is being prepared for the purpose of fulfilling the U.S. Army Corps of Engineers (USACE) requirements as outlined under Section 7(c) of the Endangered Species Act (ESA) of 1973, as amended. The proposed Federal action is the rehabilitation of damaged flood control works, Lower White Oak Bayou, Harris County, Texas. This BA is being prepared to assist the U.S. Fish and Wildlife Service (USFWS) personnel in fulfilling their obligations under the ESA.

1.2 DESCRIPTION OF THE PROPOSED ACTION

The USACE proposes to repair a 450 foot length of damaged area in the White Oak FFCP on the north side of the I-10 crossing (see Figure 1). The repairs need to be conducted at current engineering standards. Current engineering standards would provide a greater level of reliability in the system. The most appropriate technique to correct the problem is the placement of a concrete scour pad at the top of the exiting concrete channel lining.

Under the Repair to Current Engineering Standards Plan, the USACE would repair the damaged area to current engineering standards. The current engineering standards would consist of providing a concrete scour pad across the 10-foot overbank by doweling the new concrete to the existing concrete lining. The scour pad would be protected from rapid drawdown scenarios by providing two weep holes spaced on fifteen foot centers. Excavation would be required for the placement of a sand filter bedding separated from the natural ground surface by geotextile fabric. Coarse gravel (2" x 2") would collect the subsurface drainage at the weep holes to release pressure from under the concrete surface. The limits of the repair would cover an approximate length of 450 feet.

These repairs would correct the problem of the area being prone to scouring. If the area were no longer scour prone, then the threat of slope failure and/or collapse of the concrete lining would be either significantly reduced or entirely eliminated. The repairs would also help prevent the I-10 Bridge from being impacted from a collapse of the concrete channel lining.



Figure 1. Repair location for the Lower White Oak Bayou FFCE.

2.0 FEDERALLY-LISTED THREATENED AND ENDANGERED SPECIES

The project area is located in Harris County, Texas. The USFWS considers the threatened or endangered species identified in Table 1 as possibly occurring in the county. No other species and no designated or proposed critical habitat under their jurisdiction were identified as occurring in the project vicinity.

Table 1. Federally Listed Threatened and Endangered Species – Harris County, Texas

Taxon	Common Name	Scientific Name	Federal Status
Birds	Whooping Crane	<i>Grus americana</i>	Endangered
Plants	Texas prairie dawn	<i>Hymenoxys texana</i>	Endangered

¹ USFWS, 2009. www.fws.gov/southwest/es/EndangeredSpecies/lists/ListSpecies.cfm

2.1 WHOOPING CRANE

The whooping crane is a potential migrant between the summer breeding grounds in Wood Buffalo National Park in Canada and the wintering ground in Aransas National Wildlife Refuge in Texas. Whooping cranes are known to winter in the coastal marshes of Aransas, Calhoun, and Refugio counties (TPWD 2009). The study area is an unlikely stopover site for the whooping crane because there is no suitable food source available. It is highly unlikely the whooping crane would occur in the project area. There is no listed critical habitat for the whooping crane in the project area.

2.2 TEXAS PRAIRIE DAWN

The Texas prairie dawn is found in poorly drained, sparsely vegetated areas (slick spots) at the base of mima mounds in open grassland or almost barren areas on slightly saline soils that are sticky when wet and powdery when dry. They flower in late February through early April (TPWD 2009). There is no potential for the Texas prairie dawn to occur within the project area. There is no listed critical habitat for the Texas prairie dawn in the project area.

3.0 EFFECTS OF THE PROPOSED ACTION ON LISTED SPECIES

The Texas prairie dawn and the whooping crane are highly unlikely to occur in the project area. Accordingly, the project will have no effect on these species (Table 2).

Table 2. Effects of project on Federally-listed Threatened and Endangered Species.

Common Name	Scientific Name	Effects
Whooping Crane	<i>Grus americana</i>	No Effect
Texas prairie dawn	<i>Hymenoxys texana</i>	No Effect

4.0 CONCLUSIONS

The overall conclusion is that the proposed project would have no effect on any federally-listed threatened or endangered species or critical habitat. Although threatened or endangered species may occur in the project vicinity, no regularly used habitat is known to exist in the immediate project site.

References Cited

TPWD 2009. Wildlife fact sheets. <http://www.tpwd.state.tx.us/> Accessed 27 April, 2009.

USFWS 2009b. <http://www.fws.gov/southwest/es/EndangeredSpecies/lists/>. Accessed April 28, 2009.

Appendix D – Air Certification Waivers

ADDENDUM
GENERAL CONFORMITY – RECORD OF NON-APPLICABILITY

Project/Action Name: Emergency Repairs under PL 84-99 (Flood Control and Coastal Emergency Act) to Galveston Seawall and Groins; Port Arthur, Freeport, and Texas City and Vicinity Hurricane and Flood Protection Projects; Clear Creek Second Outlet; White Oak Bayou; and North Padre Island Storm Damage Reduction and Environmental Restoration Project, Texas.

Project/Action Point of Contact: Carolyn Murphy
Chief, Environmental Section
U.S. Army Corps of Engineers
Galveston District
P.O. Box 1229, Galveston, TX 77553

General Conformity under the Clean Air Act, Section 176 has been evaluated for the seven projects described above according to the requirements of 40 CFR 93, Subpart B. The requirements of this rule are not applicable to these projects because the projects are exempt actions under 40 CFR 93.153(e)(1) and 30 TAC 101.30(c)(5)(A) since it is impractical to prepare the conformity analyses which might otherwise be required and the actions cannot be delayed due to overriding concerns for public health and welfare, especially in view of the upcoming hurricane season.

On February 24, 2009 I issued a Clean Air Act General Conformity Record of Non-Applicability which exempted the first four projects listed above, effective through September 13, 2009. In light of the complexities of execution of emergency repairs for these projects, I have now further determined for the reasons stated above that it is appropriate to extend this exemption pursuant to 40 CFR 93.153(e)(2) and 30 TAC 101.30(c)(5)(B) for an additional six months, through March 13, 2010. The extended exemption is also determined applicable to the last three projects listed above to likewise address complexities in repair execution.

The projects are not considered regionally significant under 40 CFR 93.153(i). Supporting documentation appears in the Project Information Reports and National Environmental Policy Act documentation for these actions.

 4 APR 2009

David C. Weston
Colonel, Corps of Engineers
District Commander

Date

