# FINAL ENVIRONMENTAL ASSESSMENT

## IMPROVEMENTS TO THE ARROYO COLORADO SOUTH LEVEE, HIDALGO AND CAMERON COUNTIES, TEXAS

*Lead Agency*

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**United States Section,**
**International Boundary and**
**Water Commission**

**El Paso, Texas**

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**505 East Huntland Drive, Suite 250**
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**November 2010**

# COVER SHEET

# FINAL ENVIRONMENTAL ASSESSMENT

## AND

# FINDING OF NO SIGNIFICANT IMPACT

# IMPROVEMENTS TO THE ARROYO COLORADO SOUTH LEVEE

**LEAD AGENCY:** United States Section, International Boundary and Water Commission (USIBWC)

**PROPOSED ACTION:** Improvements to the Arroyo Colorado South Levee system (ACS) in order to address the 100-year flood protection criteria established by the Federal Emergency Management Agency (FEMA).

**REPORT DESIGNATION:** Environmental Assessment

**ABSTRACT:** The Arroyo Colorado Floodway (ACF) is a component of the Lower Rio Grande Flood Control Project (LRGFCP) that conveys floodwater diverted from the Rio Grande to the Laguna Madre in the Gulf of Mexico and protects urban, suburban, and highly developed irrigated farmland along the Rio Grande delta in the United States and Mexico. According to hydraulic modeling performed by the USIBWC, portions of the ACS system do not meet 100-year flood protection criteria established by FEMA. In order to address the flood protection criteria, the USIBWC is proposing to raise levee segments along the ACS in Hidalgo and Cameron counties, Texas.

To raise the levee, fill material obtained from commercial sources would be added to the existing levee to bring the height to its original design specifications, or to meet a 3-foot freeboard design criterion. A maximum of 6 feet of fill material would be placed on top of the levee. Levee expansion activities would take place along the existing levee right of way easement. The need for excavation outside the levee structure is not anticipated.

This Environmental Assessment (EA) evaluates the potential impacts of the No Action Alternative, Alternative 1, and the Preferred Alternative. Potential impacts on natural, cultural, and other resources were evaluated. A Finding of No Significant Impact was issued for the Preferred Alternative based on a review of the facts and analyses contained in the Environmental Assessment.

# FINDING OF NO SIGNIFICANT IMPACT

# IMPROVEMENTS TO THE ARROYO COLORADO SOUTH LEVEE IN CAMERON AND HIDALGO COUNTIES, TEXAS

**LEAD AGENCY:** United States Section, International Boundary and Water Commission

## BACKGROUND

The Lower Rio Grande Flood Control Project (LRGFCP) extends approximately 186 miles from Peñitas, Texas to the mouth of the Rio Grande in the Gulf of Mexico, along Hidalgo, Cameron and Willacy Counties. The project was the result of a 1932 agreement between the United States and Mexico to provide flood protection to urban, suburban, and agricultural lands in both countries. The LRGFCP includes an interior floodway system comprised of the Main Floodway, the North Floodway and the Arroyo Colorado Floodway (ACF). This interior floodway system initiates in the Main Floodway that subsequently separates into the North Floodway and the Arroyo Colorado Floodway at the City of Mercedes. The ACF conveys floodwater diverted from the Rio Grande to the Laguna Madre in the Gulf of Mexico and protects urban, suburban, and highly developed irrigated farmland along the Rio Grande delta in the United States and Mexico.

Initial hydraulic modeling of the ACS by the USIBWC indicates that the westernmost 3 miles of the levee do not meet FEMA flood protection criteria. However, detailed engineering studies are ongoing and may identify additional areas within the ACS with structural deficiencies. The hydraulic evaluation indicated that an increase in levee height, up to 6 feet, would be necessary in a number of sections of the ACS to meet design criteria for flood protection.

The purpose of the Proposed Action is to improve the ACS in order to address the 100-year flood protection criteria established by FEMA. Improvements to the ACS are needed to retain FEMA levee system certification, as areas currently protected by the ACS were identified to be insufficiently protected.

## PROPOSED ACTION

To raise the levee, fill material obtained from commercial sources outside the levee system would be added to the existing levee to bring the height to its original design specifications or to meet a 3-foot freeboard design criterion. The need for excavation outside the levee structure is not anticipated. A maximum of 6 feet of fill material would be placed on top of the levee. Typically, as the levee height is increased, the footprint would expand within the USIBWC ROW. However, in order to minimize footprint expansion due to raising the levee, both landside and riverside slopes would be steepened up to 2.5:1. In some reaches of the levee system, if required by the presence of irrigation structures or other constraints, expansion would be made with an offset centerline, placing the additional footprint on only one side of the existing levee.

Other modifications to the levee would include construction of a 15-foot wide access road on both the riverside and landside of the levee and widening of the levee crown to 16 feet where

necessary. The riverside edge of the existing de facto wildlife corridor would serve as the limits of construction for the landside of the levee, to the maximum extent practicable. Any construction within the de facto wildlife corridor would be coordinated with the U.S. Fish and Wildlife Service (USFWS) and no trees within the de facto wildlife corridor would be cleared without prior approval of the USFWS. In addition, no construction activities would occur within the Lower Rio Grande National Wildlife Refuge (LRGNWR) tract near levee mile 7. Construction activities along the LRGNWR tract near levee mile 13 would be limited to the riverside of the levee only. As with the de facto wildlife corridor, all construction activities within the LRGNWR tract would be coordinated with the USFWS. Footprint expansion would occur entirely within the ACS ROW. Structural improvements (e.g., seepage remediation) may be needed in some sections of the levee. These improvements would not contribute to footprint expansion of the current levee footprint.

The Preferred Alternative consists of raising the levee height for the entire 16 miles to increase the flood containment capacity of the ACS. No changes are under consideration in routine maintenance activities, such as vegetation management, grading to repair erosion damage and to maintain structural and functional integrity of the levees. The USIBWC anticipates a phased implementation approach for the Preferred Alternative. The phased approach would allow planned activities to be executed efficiently and in a timely manner, as funding becomes available.

## SUMMARY OF FINDINGS

Pursuant to National Environmental Policy Act (NEPA) guidance (40 Code of Federal Regulations 1500 – 1508), the President's Council on Environmental Quality issued regulations for NEPA implementation including provisions for both the content and procedural aspects of the required Environmental Assessment (EA). The USIBWC completed an EA of the potential environmental consequences of improvements to the flood control and water delivery capabilities of the ACS. The EA, which supports this Finding of No Significant Impact (FONSI), evaluated the No Action Alternative, Alternative 1, and the Preferred Alternative. Levee expansion beyond the current flood control project right-of-way (ROW) was ruled out as a viable, or needed, option for levee improvements. Based on the evidence presented in the Final EA, impacts resulting from the Preferred Alternative have been identified below.

### *Preferred Alternative*

### Biological Resources

Levee construction activities would affect approximately 236 acres of vegetation along the entire ACS project area through vegetation removal and fill activities. Impacts would occur on the levee slopes and adjacent, narrow strips of land for expansion where fill would be added along the riverside of the levee. Approximately 147 acres (62% of vegetation communities within the project area) of the vegetation impacted would include low quality, non-native, grass-covered slopes of the existing levee. Additional vegetation communities impacted include adjacent rangeland, agricultural land, woodland/thornscrub, borrow pits, old-field communities, one nonjurisdictional wetland, and riparian vegetation associated with the drainage ditches and irrigation canals. Approximately 8 acres (3% of vegetation communities within the project area)

of vegetation associated with a de facto wildlife travel corridor that exists along much of the USIBWC landside levee right-of-way would be impacted. A small area (3.7 acres of disturbed levee and 3.7 acres of woodland/thornscrub communities) of vegetation associated with the riverside of the LRGNWR tract near levee mile 13 would also be removed. USIBWC would compensate the loss of woodland/thornscrub habitat on a 3:1 acre basis (3 acres protected for every 1 acre disturbed) and riparian habitat on a 1:1 acre basis. Land of equal value would be compensated under conservation easement, land acquisition, or monetary payment.

It is anticipated that wildlife species present in the project area would move to adjacent, undisturbed areas during construction and rapidly re-colonize the area after the work is completed and after the vegetation has been re-established. USIBWC would work in close coordination with the USFWS to develop measures to minimize impacts to the de facto wildlife travel corridor, the LRGNWR tract, and wildlife.

The project area is composed primarily of regularly maintained or cultivated areas that provide relatively low quality habitat for most wildlife species. Routine maintenance activities would remain unchanged. Due to the marginal habitat impacted and the temporary nature of the impacts, it is determined that the construction and operation activities associated with Preferred Alternative would not likely adversely affect threatened or endangered species.

### Cultural Resources

Levee footprint expansion would take place along the current levee ROW. The use of heavy equipment in the floodway and staging areas to add and move soil material for levee expansion may cause soil disturbance several inches deep in the project area. Upon the investigation of six High Probability Areas within the Area of Potential Affect (APE) through pedestrian survey and mechanical trenching, no archeological resources were observed during the excavation of a series of exploratory trenches within the APE. Given these data, no adverse effects to archeological resources would be anticipated from construction activities associated with the Preferred Alternative. No consideration is needed for nomination of this area to the National Register for Historic Places (NRHP).

Architectural resources may be adversely affected by expansion of the levee footprint. Potential effects include vibration and ground disturbance from the use of heavy equipment during construction as well as effects caused by alterations to the levee itself. A survey of the architectural resources for NRHP eligibility documented 11 structures that are potentially eligible for individual listing in the NRHP, while 57 are not individually eligible but would be considered contributing elements of the district. USIBWC would work in close coordination with the THC to develop measures to ensure no significant impacts to NRHP-eligible resources. No resources or concerns to Native American Tribes have been identified or are anticipated to be affected by the Preferred Alternative.

### Water Resources

The Preferred Alternative would increase flood capacity and containment during severe storm events along the entire length of the ACS. Levee construction activities are expected to remove vegetation along the ACS, which could result in increased erosion potential and runoff during

heavy precipitation events. In areas where construction would occur near water bodies (e.g., impounded drainage canals), silt curtains or other erosion control devices such as temporary erosion blankets would be used to prevent sediment from reaching water bodies. Appropriate best management practices would be developed as part of the Storm Water Pollution Prevention Plan (SWPPP). Impacts are expected to be negligible to surface water and groundwater under the Preferred Action.

### Land Use

The ACS levee expansion footprint, including vehicle access areas, would occur approximately 100 feet from the centerline on the riverside of the levee. The Preferred Alternative is not anticipated to affect residential developments within the project area. The Preferred Alternative would primarily impact narrow strips of agricultural land, rangeland, and commercial (i.e., sand mining) properties adjacent to and paralleling the south levee. No prime or unique farmlands are located within the project area in Hidalgo County. A small area (approximately 2.5 acres) located within Cameron County is used for crop production and contains Laredo silty clay loam and Harlingen clay, prime farmland soils. However, the impacts would be associated with temporary construction activities (e.g., temporary placement of fill) and changes in land use in this area would not occur. Therefore, impacts to prime farmland soils would be negligible.

Activities associated with levee construction may periodically disrupt access to sand mining properties that are located adjacent to some segments of the south levee as well as an archery range. The areas of ACS levee expansion would not be anticipated within areas where sand mining excavation occurs or within or adjacent to areas used for archery activities. Post-construction routine maintenance activities are anticipated to be similar to present-day maintenance activities. Therefore, negligible impacts are anticipated to commercial properties from construction, operation and management activities.

### Community Resources

Residents and property along the ACS would benefit from increased flood protection. During construction activities, a temporary influx of employment, business sales volume, and income would occur in Cameron and Hidalgo Counties. A small but positive, temporary economic contribution to the local community would occur as a result of the Preferred Alternative. The benefit would be small for Hidalgo County given its large economic base, less than 1.5% of the annual county employment, income and sales values. The effect would be more slightly more substantial (less than 2.5%) in Cameron County because of its smaller population. No adverse impacts to disproportionately high minority and low-income populations were identified for construction activities. Moderate utilization of public roads would be required during construction, with a temporary increase in access road for equipment mobilization to staging areas.

### Environmental Health

Estimated air emissions of any of the five criteria pollutants during construction would be discontinuous and represent less than 0.3 percent of the annual emissions inventory for Hidalgo and Cameron counties. There would be a moderate increase in ambient noise levels due to

construction activities. Neither long-term nor regular exposure is expected above noise threshold values. A database search indicated that no waste storage and disposal sites were within proposed work areas, and none would affect, or be affected, by the proposed ACS improvements.

### Cumulative Impacts

A review of current and proposed local, state, and federal activities in and near the Project area identified the Main and North Floodway Levee Improvements Project and the Arroyo Colorado North Levee Improvements Project as having identified impacts that occur in the Project area. However, the cumulative effects of these activities would not be significant.

### Best Management Practices

Best management practices would be implemented as part of the Preferred Alternative to minimize the potential for impacts to natural and cultural resources.

A SWPPP would be developed during project design to minimize impacts to receiving water, as specified by USEPA regulations for construction projects. All USACE permits and clearances necessary for construction in areas designated as waters of the U.S would be obtained. All permit conditions would be followed in order to minimize impacts to waters of the U.S. During project construction, methods such as soil wetting would be employed to prevent erosion from unvegetated slopes and/or corridors and to minimize additional air quality impacts from construction activities. Limiting unnecessary idling of construction vehicles and shutting down construction machines that are not in use would minimize additional air quality impacts from construction activities. Existing access points to the levee would remain in service with no change to lateral access to the levee road.

Any construction activities that are to occur along the USFWS LRGNWR tracts and the de facto wildlife travel corridor would be coordinated with the USFWS and no trees within the de facto wildlife corridor would be cleared without prior approval of the USFWS. Native vegetation species would be determined through coordination with the USFWS and the TPWD. Construction activities would be scheduled to occur outside the March through August migratory bird nesting season, when possible. Prior to and during construction activities, the contractor that would be performing the levee work would provide an environmental monitor to survey threatened and endangered species to prevent direct or indirect take of a listed species. The environmental monitor would also survey for birds protected under the MBTA to prevent destruction of nests or eggs during construction activities. USIBWC would compensate the loss of woodland/thornscrub habitat on a 3:1 acre basis and riparian habitat on a 1:1 acre basis. Land of equal value would be compensated under conservation easement, land acquisition, or monetary payment.

In the event that any human remains or burial furniture are encountered during construction, all work would cease and law enforcement and the THC would be notified.

**DECISION**

Based on my review of the facts and analyses contained in the Environmental Assessment, I conclude that implementation of the Preferred Alternative to improve the Arroyo Colorado South Levee system would not have a significant impact. Accordingly, requirements of the National Environmental Policy Act and regulations promulgated by the Council on Environmental Quality are fulfilled and an environmental impact statement is not required.

11/26/10

Edward Drusina, P.E.
Commissioner
International Boundary and Water Commission,
United States Section

Date

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# Table of Contents

**Page**

SECTION 1 : INTRODUCTION ..... 1-1

1.1 Purpose and Need for Action ..... 1-2

1.2 Background ..... 1-3

1.2.1 USIBWC Authority ..... 1-3

1.2.2 Levee System Description ..... 1-3

1.3 Environmental Coordination and Compliance ..... 1-4

SECTION 2 : DESCRIPTION OF ALTERNATIVES ..... 2-1

2.1 No Action Alternative ..... 2-3

2.2 Alternative 1: Levee Rehabilitation – 3 Miles ..... 2-3

2.3 Alternative 2 (Preferred Alternative): Levee Rehabilitation – 16 Miles ..... 2-3

2.4 Alternatives Considered and Eliminated from Detailed Study ..... 2-3

SECTION 3 : AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES ..... 3-1

3.1 Biological Resources ..... 3-1

3.1.1 Vegetation ..... 3-2

3.1.2 Wetlands and Waterbodies ..... 3-5

3.1.3 Wildlife ..... 3-7

3.1.4 Threatened and Endangered Species ..... 3-8

3.2 Cultural Resources ..... 3-11

3.2.1 Previous Cultural Resources Studies ..... 3-11

3.2.2 Archeological Resources ..... 3-12

3.2.3 Architectural Resources ..... 3-14

3.2.4 Native American Resources ..... 3-15

3.3 Water Resources ..... 3-17
3.3.1 Flood Control ..... 3-17
3.3.2 Water Quality ..... 3-18
3.4 Land Use ..... 3-20
3.4.1 Natural Resources Management Areas ..... 3-20
3.4.2 Agricultural Land and Rangeland ..... 3-22
3.4.3 Residential Areas ..... 3-23
3.4.4 Commercial Properties ..... 3-24
3.5 Community Resources ..... 3-25
3.5.1 Socioeconomics ..... 3-25
3.5.2 Environmental Justice ..... 3-30
3.5.3 Transportation ..... 3-32
3.6 Environmental Health ..... 3-33
3.6.1 Air Quality ..... 3-33
3.6.2 Noise ..... 3-36
3.6.3 Hazardous Materials ..... 3-37
3.7 Cumulative Impacts ..... 3-38
3.7.1 Biological Resources ..... 3-39
3.7.2 Cultural Resources ..... 3-39
3.7.3 Water Resources ..... 3-40
3.7.4 Land Use ..... 3-40
3.7.5 Community Resources ..... 3-40
3.7.6 Environmental Health ..... 3-40
SECTION 4 : BEST MANAGEMENT PRACTICES ..... 4-1
4.1 Engineering Measures ..... 4-1

4.2 Natural Resources ..... 4-2

4.3 Cultural Resources ..... 4-2

SECTION 5 : ENVIRONMENTAL COMPLIANCE AND COORDINATION ..... 5-1

5.1 Consultation ..... 5-1

5.2 List of Contributors ..... 5-1

SECTION 6 : REFERENCES ..... 6-1

## Appendices

APPENDIX A: DETAILED MAPS OF THE ARROYO COLORADO SOUTH LEVEE PROJECT AREA

APPENDIX B: BIOLOGICAL EVALUATION

APPENDIX C: WATERS OF THE UNITED STATES DELINEATION REPORT

APPENDIX D: CORRESPONDENCE

# List of Figures

Figure 1-1: Arroyo Colorado South Levee Vicinity Map.....1-1-2

Figure 2-1: Typical Cross-section of a Levee Illustrating Footprint Expansion ..... 2-2

# List of Tables

Table 1-1: Summary of Environmental Coordination and Compliance ..... 1-6

Table 2-1: Summary of Environmental Impacts of Proposed Arroyo Colorado South Levee Improvements..... 2-4

Table 3-1: Acreages of Vegetation Impacts from Alternative 1 and the Preferred Alternative..... 3-4

Table 3-2: Federally Listed T&E Species with the Potential to Occur in the ACS Project Area..... 3-9

Table 3-3: Architectural Resources in the Area of Potential Effect ..... 3-14

Table 3-4: Population Growth in Cameron and Hidalgo Counties..... 3-25

Table 3-5: Estimated Total Housing Units, Single Family Units and Multi-Family Units for Cameron and Hidalgo Counties ..... 3-26

Table 3-6: Estimated Change in Total Housing Units for Cameron and Hidalgo Counties from 2000 to 2008..... 3-26

Table 3-7: Economic Impacts of the Arroyo Colorado South Levee System in Cameron County..... 3-28

Table 3-8: Economic Impacts of the Arroyo Colorado South Levee System in Hidalgo County..... 3-29

Table 3-9: Percentage of Minority Populations and Poverty Rates in the Project Area..... 3-31

Table 3-10: Air Emissions for Improvements to the Arroyo Colorado South Levee System..... 3-35

Table 3-11: Air Emissions for Improvements to the Main and North Floodway Levee, Arroyo Colorado North Levee and Arroyo Colorado South Levee Systems ..... 3-41

Table 5-1: EA Mailing List of Agencies and Organizations ..... 5-1

Table 5-2: List of Contributors to the Environmental Assessment..... 5-2

# List of Acronyms

| | |
|---|---|
| ACF | Arroyo Colorado Floodway |
| ACS | Arroyo Colorado South Levee system |
| AIRFA | American Indian Religious Freedom Act |
| AQCR | Air Quality Control Regions |
| BE | Biological Evaluation |
| CAA | *Clean Air Act* |
| CEQ | Council on Environmental Quality |
| CERCLA | *Comprehensive Environmental Response, Compensation, and Liability Act* |
| CFR | Code of Federal Regulations |
| cfs | Cubic feet per second |
| CWA | *Clean Water Act* |
| dB | Decibels |
| DNL | Day-night average sound level |
| EA | Environmental Assessment |
| FEMA | Federal Emergency Management Agency |
| FR | Federal Register |
| HPA | High Probability Area |
| IBWC | International Boundary and Water Commission |
| LRGFCP | Lower Rio Grande Flood Control Project |
| LRGNWR | Lower Rio Grande National Wildlife Refuge |
| LRGV | Lower Rio Grande Valley |
| NAAQS | National Ambient Air Quality Standards |
| NAGPRA | *Native American Graves Protection and Repatriation Act* |
| NEPA | *National Environmental Policy Act* |
| NHPA | *National Historic Preservation Act* |
| NPDES | National Pollutant Discharge Elimination System |
| NRCS | Natural Resources Conservation Service |
| PEIS | Programmatic Environmental Impact Statement |
| PL | Public Law |
| RCRA | Resource Conservation and Recovery Act |
| ROW | Right-of-way |
| SARA | *Superfund Amendments and Reauthorization Act* |
| SHPO | State Historic Preservation Office |
| SWPPP | Storm Water Pollution Prevention Plan |
| T&E | Threatened and Endangered Species |
| TAC | Texas Administrative Code |
| TCEQ | Texas Commission on Environmental Quality |
| THC | Texas Historic Commission |
| TPWD | Texas Parks and Wildlife Department |
| TRC | TRC Environmental Corporation |
| TSCA | *Toxic Substances Control Act* |
| TxDOT | Texas Department of Transportation |
| US | United States |
| USACE | United States Army Corps of Engineers |
| USBP | United States Border Patrol |
| USC | United States Code |
| USDA | United States Department of Agriculture |
| USDOT | United States Department of Transportation |
| USEPA | United States Environmental Protection Agency |
| USFWS | United States Fish and Wildlife Service |
| USIBWC | United States Section, International Boundary and Water Commission |
| WIID | Water Information Integration and Dissemination |

# SECTION 1:

# PURPOSE AND NEED FOR THE PROPOSED ACTION

## 1.1 INTRODUCTION

The United States Section of the International Boundary and Water Commission (USIBWC) prepared this Environmental Assessment (EA) for proposed flood control improvements along the Arroyo Colorado Floodway (ACF) located in Hidalgo and Cameron Counties, Texas. The ACF is a component of the Lower Rio Grande Flood Control Project (LRGFCP) that conveys floodwater diverted from the Rio Grande to the Laguna Madre in the Gulf of Mexico and protects urban, suburban, and highly developed irrigated farmland along the Rio Grande delta in the United States and Mexico.

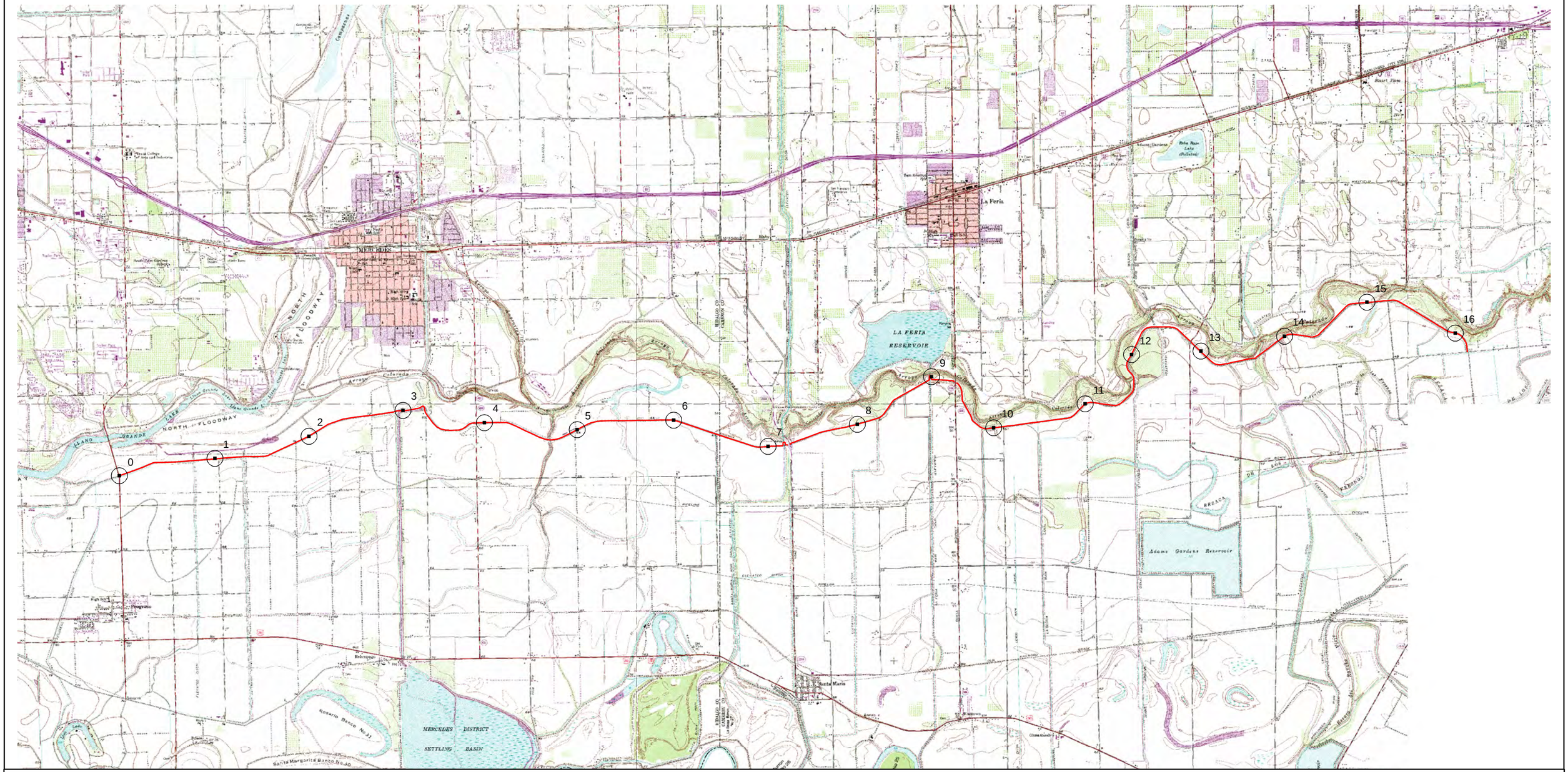
The Proposed Action would involve improvements to the Arroyo Colorado South Levee system (ACS) in order to address the 100-year flood protection criteria established by the Federal Emergency Management Agency (FEMA). Improvements to the ACS would include raising the levee by adding fill material to the existing levee to bring flood control to the original design specifications with a minimum of 3 feet of freeboard, the difference between the top of the levee and the designed water surface elevation. Figure 1.1 shows the layout of the upper and lower reaches of the project area, main geographical features, and levee mile markers. Appendix A provides detailed maps of the project area.

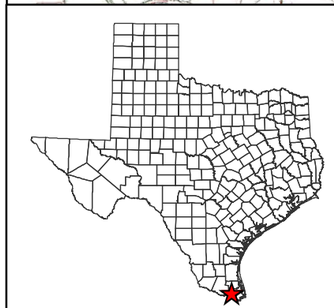
This EA has been tiered to the *Final Programmatic Environmental Impact Statement – Improvements to the USIBWC Rio Grande Flood Control Projects along the Texas-Mexico Border* (USIBWC 2008) completed by the USIBWC for long-term improvements to Rio Grande flood control projects operated along the Texas-Mexico border. Descriptions of environmental conditions along the ACS presented in this EA are summaries of more detailed information provided in the Biological Evaluation (BE) in Appendix B and the Waters of the U.S. Delineation Report (Appendix C) of this EA, as well as the 2008 Programmatic Environmental Impact Statement (PEIS). These descriptions are supplemented with data from biological and cultural resources field evaluations conducted in support of the EA preparation.

## 1.2 PURPOSE AND NEED FOR ACTION

Initial hydraulic modeling of the ACS by the USIBWC indicates that the westernmost 3 miles of the levee does not meet FEMA flood protection criteria. However, detailed engineering studies are ongoing and may identify additional areas within the ACS with structural deficiencies. The hydraulic evaluation indicated that an increase in levee height of up to 5.5 feet would be necessary in a number of sections of the ACS to meet design criteria for flood protection.

The purpose of the Proposed Action is to improve the 16-mile ACS in order to address the 100-year flood protection criteria established by FEMA. Improvements to the ACS are needed to obtain FEMA levee system accreditation because areas currently protected by the ACS were identified to be deficient.



N

0 1 2 3 Miles

Levee Mile Markers

South Levee Centerline

**FIGURE 1.1**

Arroyo Colorado South Levee Project

Source

USGS Harlingen, La Feria, Mercedes, Progreso and Santa Maria Quadrangles (2002).
Hidalgo and Cameron Counties, Texas

International Boundary and Water Commission
United States Section

## 1.3 BACKGROUND

### 1.3.1 USIBWC Authority

The International Boundary and Water Commission (IBWC) – which before 1944 was known as the International Boundary Commission – was created by the Convention of 1889, and consists of a United States Section (USIBWC) and a Mexican Section. The IBWC was established to apply the rights and obligations the Governments of the United States and Mexico assumed under the numerous boundary and water treaties and related agreements. Application of the rights and obligations are accomplished in a way that benefits the social and economic welfare of the people on both sides of the boundary and improves relations between the two countries. The mission of the USIBWC has five components, as follows:

- regulation and conservation of waters of the Rio Grande for use by the United States and Mexico through joint construction, operation, and maintenance of international storage dams and reservoirs and plants for generating hydroelectric energy at the dams, and regulation of the Colorado River waters allocated to Mexico;
- distribution of waters of the Rio Grande and the Colorado River between the two countries;
- protection of lands along the Rio Grande from floods through levee and floodway projects and resolution of border sanitation and other border water quality problems;
- preservation of the Rio Grande and the Colorado River as the international boundary; and
- demarcation of the land boundary.

### 1.3.2 Levee System Description

The LRGFCP extends approximately 186 miles from Peñitas, Texas to the mouth of the Rio Grande in the Gulf of Mexico, along Hidalgo, Cameron, and Willacy counties. The project was the result of a 1932 agreement between the United States and Mexico to provide flood protection to urban, suburban, and agricultural lands in both countries. The LRGFCP includes an interior floodway system comprised of the Main Floodway, the North Floodway and the ACF. This interior floodway system initiates in the Main Floodway that subsequently separates into the North Floodway and the ACF at the City of Mercedes.

The following terminology is used throughout the report:

- Floodway: In this EA, the floodway is restricted to the area between the Arroyo Colorado and the south levee.
- Riverside of levee: The area from the center of the south levee toward the ACF.
- Landside of levee: The area from the center of the south levee extending away from the ACF. The landside of the levee generally is not subject to the same flooding conditions as the floodway unless the levee is overtopped.

- Right-of-way (ROW): The areas on the riverside and landside of the levee managed by the USIBWC. The USIBWC has access to the ROW through land easements.
- Irrigation canals: Excavated drainages that provide water from the Rio Grande to irrigate agricultural lands.
- Drainage ditches: Excavated and natural drainages, including the excavated drainages adjacent to and paralleling the south levee (i.e., levee borrow ditches), that receive surface and sub-surface water from agricultural lands.
- Existing levee footprint: The current width of the levee without any improvements or changes. For the purposes of this report, the existing levee footprint is assumed to be 76 feet wide and approximately 16 miles long.
- Project area: The land on both sides of the levee included in visual surveys and verified with aerial imagery. The project area is assumed to be the area from 100 feet from the centerline of the levee on both the riverside and landside.
- De facto wildlife travel corridor: The area located on the landside of the levee associated with the drainage ditch located beyond the levee toe and running parallel to the levee within the USIBWC ROW.
- Construction corridor: The area of the levee identified as having deficiencies, where fill would be added to the top of the levee to provide adequate flood control. The construction corridor also includes areas where staging of equipment and/or materials would occur. The construction corridor is assumed to be the area from 100 feet from the centerline of the levee on the riverside and to the riverside edge of the existing de facto wildlife travel corridor on the landside.
- Area of Potential Effect: The area where cultural resources may occur and may be affected by construction activities.

## 1.4 ENVIRONMENTAL COORDINATION AND COMPLIANCE

Federal agencies are required to take into consideration the environmental consequences of proposed and alternative actions in the decision-making process under the National Environmental Policy Act (NEPA) of 1969, as amended. The President's Council on Environmental Quality (CEQ) issued regulations to implement NEPA that include provisions for both the content and procedural aspects of the required environmental analysis. In 1978, the CEQ issued regulations implementing the process (40 Code of Federal Regulations [CFR] 1500-1508).

The USIBWC regulations for implementing NEPA are specified in *Operational Procedures for Implementing Section 102 of the National Environmental Policy Act of 1969, Other Laws Pertaining to Specifics Aspects of the Environment and Applicable Executive Orders* (46 FR 44083, September 2, 1981). These federal regulations establish both the administrative process and substantive scope of the environmental impact evaluation designed to ensure that USIBWC has a proper understanding of the potential environmental consequences of a contemplated course of action.

Table 1-1 is a summary of regulatory and/or permitting requirements potentially applicable to improvements under consideration, potential compliance issues, and anticipated level of environmental coordination.

**Table 1-1: Summary of Environmental Coordination and Compliance**

| Agency or Organization | Regulation or Issue | Level of USIBWC Coordination |
|---|---|---|
| **Biological Resources** | | |
| U.S. Fish and Wildlife Service (USFWS) | Endangered Species Act of 1973 (Public Law 93-205) and amendments of 1988 (Public Law 100-478)<br><br>Fish and Wildlife Coordination Act (916 USC 661, *et seq.)*<br><br>Migratory Bird Treaty Act of 1918, as amended (16 USC 703-712; Ch. 128; July 13, 1918; 40 Stat. 755)<br><br>National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee) | Section 7 of the Act requires formal consultation if significant adverse impacts to federally listed, threatened and endangered species could occur due to the Proposed Action.<br><br>Requires federal agencies to consult with USFWS regarding impact of Proposed Action on any waters controlled or modified.<br><br>Requires consultation to determine whether migratory birds and T&E species could be affected.<br><br>Requires coordination with USFWS wildlife refuge managers if wildlife refuges are affected. |
| Texas Parks and Wildlife Department (TPWD) | Chapters 67 and 68 of the TPWD Code, and Section 65.171-65.184 of the Texas Administrative Code<br><br>Fish and Wildlife Coordination Act (916 USC 661, *et seq.)* | Requires coordination concerning impacts on wildlife and threatened and endangered species.<br><br>Requires federal agencies to consult with TPWD regarding impact of Proposed Action on any waters controlled or modified. |
| **Cultural Resources** | | |
| State Historic Preservation Office (SHPO) | National Historic Preservation Act (NHPA) of 1966, as amended (16 USC 470 *et seq.)*<br><br>American Indian Religious Freedom Act (AIRFA), 1978<br><br>Native American Graves Protection and Repatriation Act (NAGPRA), 1990 | Requires federal agencies to consult with the Texas Historic Commission (THC) regarding cultural and historic resources. |

| Agency or Organization | Regulation or Issue | Level of USIBWC Coordination |
|---|---|---|
| **Water Resources** | | |
| U.S. Army Corps of Engineers (USACE) | Section 10 of the Rivers and Harbors Act of 1899<br><br>Section 404 of the Clean Water Act (33 USC 1344) | Requires pre-permit application. If waters of the United States are affected, a mitigation plan and a permit application would be required. |
| Texas Commission on Environmental Quality (TCEQ) | Section 401 of the Clean Water Act (33 USC 1344); Section 26.040 of Texas Water Code | Section 401 Certification: conditions and mitigation measures may be stipulated for the 401 permit; coordination is typically a function of the USACE permitting process. |
| United States Environmental Protection Agency (USEPA) | Section 402 of the Clean Water Act<br><br>Section 404 of the Clean Water Act | Requirements for National Pollutant Discharge Elimination System (NPDES) construction permit and Storm Water Pollution Prevention Plan (SWPPP) preparation.<br><br>Section 404 Certification; coordination typically is a function of the USACE permitting process.<br><br>Section 402 Certification will be coordinated with the TCEQ |
| **Other Issues** | | |
| Natural Resources Conservation Service (NRCS) | Farmland Protection Policy Act | Determination that no unique or prime farmland would be affected by the federal project. |
| U.S. Border Patrol (USBP) | Levee Road Usage | Coordination during construction activities. |
| Irrigation Districts | Modifications and construction along irrigation canals | Hidalgo County Irrigation District No. 5, Hidalgo County Irrigation District No. 9, Cameron County Irrigation District No. 9, Santa Maria Irrigation District, La Feria Irrigation District, Adams Garden Irrigation District, Harlingen Irrigation District: Levee construction along the ACF |
| Drainage Districts | Modifications and construction along drainage canals | Cameron County Drainage District No. 5, Hidalgo County Drainage District No. 1: Levee construction along the ACF |

| Agency or Organization | Regulation or Issue | Level of USIBWC Coordination |
|---|---|---|
| Local and County Governments | Noise and air ordinances | Coordination with the Town of Progreso<br>Coordination with Cameron County<br>Coordination with Hidalgo County |

# SECTION 2:

# DESCRIPTION OF ALTERNATIVES

This section identifies alternatives evaluated in this document associated with the ACS Levee Rehabilitation Project. Under the No Action Alternative, the current levee footprint would be retained and improvements would not be made. Under Alternative 1, the westernmost 3 miles of the levee would be rehabilitated, while under Alternative 2 (the Preferred Alternative), the entire 16 miles of levee would be rehabilitated.

The existing levee is a raised trapezoidal compacted-earth structure with an average crown width of 16 feet, an average height of 10 to 15 feet, and an approximate 3:1 to 4:1 side slope ratio (horizontal feet per foot of height; [H:V]). The existing levee footprint width typically ranges from 70 to 140 feet, depending on location.

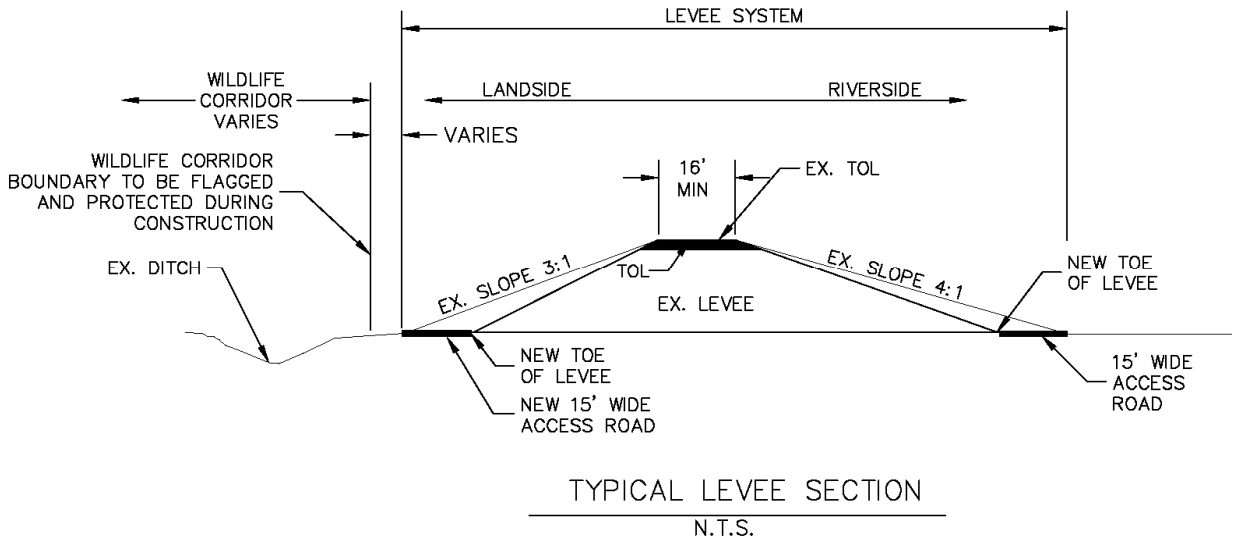
***Levee Improvements Proposed Under Alternatives 1 and 2***

To raise the levee, fill material obtained from commercial sources outside the levee system would be added to the existing levee to bring the height to its original design specifications or to meet a 3-foot freeboard design criterion. Fill material would be placed along the top and slopes of both the riverside and landside of the levee. The need for excavation outside the levee structure is not anticipated.

A maximum of 6 feet of fill material would be placed on top of the levee. Typically, as the levee height is increased, the footprint would expand within the USIBWC ROW. However, in order to minimize footprint expansion due to raising the levee, both landside and riverside slopes would be steepened up to 2.5:1 H:V. In some reaches of the levee system, if required by the presence of irrigation structures or other constraints, expansion would be made with an offset centerline, placing the additional footprint on only one side of the existing levee.

Other modifications to the levee would include construction of a 15-foot wide access road on both the riverside and landside of the levee and widening of the levee crown to 16 feet where necessary. The riverside edge of the existing wildlife corridor would serve as the limits of construction for the landside of the levee, to the maximum extent practicable. A typical cross-section of a levee is shown in Figure 2.1.

**Figure 2-1: Typical Cross-section of a Levee Illustrating Footprint Expansion**




Footprint expansion would occur entirely within the flood control project ROW. Structural improvements (e.g., seepage remediation) may be needed in some sections of the levee. These improvements would not contribute to footprint expansion of the current levee footprint. Structural improvements could include the following:

- Relief wells: construction of wells along the access road on the landside of the levee. Wells would be protected with a concrete vault below the access road grade and discharge water into the de facto wildlife corridor via pipe.
- Toe drain: construction of an underground drain at the landside toe of the levee to drain seepage away from the levee
- Cutoff trench: placement of impervious material into the levee foundation via trench
- Riverside impervious blankets: placement of impervious material along the riverside levee slope
- Floodwall: thin, vertical, structural barriers constructed atop an embankment levee as a supplemental extension
- Concrete rip-rap: placement of concrete grout on the riverside slope of the levee

Construction activities for Alternative 1 and the Preferred Alternative would incorporate the best management practices presented in Section 4. Drainage and irrigation structures are located along the levee. These structures may require modification. The USIBWC, in coordination with the appropriate irrigation or drainage district, may use the following modification options: remove and plug the structures with concrete or quality material, remove and replace the structures in-kind, extend and raise the structures to the new levee height, or abandon the structures and cover them in-place with concrete or quality material.

## 2.1 NO ACTION ALTERNATIVE

The No Action Alternative would retain the current configuration of the ACS levee system. No changes in routine maintenance activities such as vegetation management and grading to repair erosion damage and maintain structural and functional integrity of the levees would be implemented. The levee would continue to fail to meet FEMA 100-year flood protection criteria.

## 2.2 ALTERNATIVE 1: LEVEE REHABILITATION – 3 MILES

Alternative 1 consists of raising the levee height of the westernmost 3 miles (Farm to Market Road 1015 to levee mile 3; Appendix A, Figure A-1) to increase the flood containment capacity of the ACS within that area. Previous geotechnical studies indicate that encroachment of the wildlife corridor, by up to 30 feet, would be required for the area from levee mile 0 to 3,500 feet eastward. In addition, approximately 160 relief wells, spaced between 40 and 100 feet apart, would be required within the westernmost 3 miles of the levee. No changes in routine maintenance activities such as vegetation management and grading to repair erosion damage and maintain structural and functional integrity of the levees would be implemented.

## 2.3 ALTERNATIVE 2 (PREFERRED ALTERNATIVE): LEVEE REHABILITATION – 16 MILES

The Preferred Alternative consists of raising the levee height for the entire 16 miles to increase the flood containment capacity of the ACS. Previous geotechnical studies indicate that encroachment of the wildlife corridor, by up to 30 feet, would be required for the area from levee mile 0 to 3,500 feet eastward. In addition, approximately 400 relief wells, spaced between 40 and 100 feet apart, would be required for the entire 16 miles of the levee. No changes would occur to routine maintenance activities such as vegetation management and grading to repair erosion damage and maintain structural and functional integrity of the levees.

The USIBWC anticipates a phased implementation approach for the Preferred Alternative. The phased approach would allow planned activities to be executed efficiently and in a timely manner, as funding becomes available.

## 2.4 ALTERNATIVES CONSIDERED AND ELIMINATED FROM DETAILED STUDY

Levee expansion beyond the current flood control project ROW was ruled out as a viable or necessary option for levee improvements. Table 2-1 summarizes the potential environmental impacts of all alternatives analyzed.

**Table 2-1: Summary of Environmental Impacts of Proposed Arroyo Colorado South Levee Improvements**

| Resource Area | Environmental Impacts | | |
|---|---|---|---|
| | **No Action Alternative** | **Alternative 1: Levee Rehabilitation – 3 miles** | **Alternative 2: Levee Rehabilitation – 16 miles (Preferred Alternative)** |
| **Biological Resources (Section 3.1)** | | | |
| **Vegetation (Section 3.1.1)** | Disturbances from routine maintenance | 44 total acres of previously disturbed land impacted (10.0% of land along 3 miles of the floodway); vegetation removal outside of migratory bird breeding season or surveys for nesting birds required | 236 total acres of previously disturbed land impacted (9.9% of land along 16 miles of the floodway); vegetation removal outside of migratory bird breeding season or surveys for nesting birds required |
| **Wetlands and Waterbodies (Section 3.1.2)** | None | 0.1-acre of riparian drainage ditch vegetation impacted; 3.7 acres of riparian de facto wildlife travel corridor vegetation impacted | 2.6 acres of riparian drainage ditch, irrigation canal, pond, and stream vegetation impacted; 8.3 acres of riparian de facto wildlife travel corridor vegetation impacted |
| **Wildlife (Section 3.1.3)** | Disturbances from routine maintenance | Temporary impacts from construction; impacts to burrowing species; impacts to de facto wildlife travel corridor | Temporary impacts from construction; impacts to burrowing species; impacts to de facto wildlife travel corridor |
| **Threatened and Endangered Species (Section 3.1.3)** | None | Not likely to adversely affect federally listed species | Not likely to adversely affect federally listed species |

**Table 2-1: Summary of Environmental Impacts of Proposed Arroyo Colorado South Levee Improvements (Continued)**

| Resource Area | Environmental Impacts | | |
|---|---|---|---|
| | **No Action Alternative** | **Alternative 1: Levee Rehabilitation – 3 miles** | **Alternative 2: Levee Rehabilitation – 16 miles (Preferred Alternative)** |
| **Cultural Resources (Section 3.2)** | | | |
| **Archeological Resources (Section 3.2.4)** | None | None | None |
| **Architectural Resources (Section 3.2.5)** | None | Impacts to 14 identified architectural resources, including 1 potentially eligible for listing in the NRHP, 6 ineligible but contributing elements, and 7 ineligible (non-historic or lacking sufficient integrity) | Impacts to 83 identified architectural resources, including 10 potentially eligible for listing in the NRHP, 56 ineligible but contributing elements, and 17 ineligible (non-historic or lacking sufficient integrity) |
| **Water Resources (Section 3.3)** | | | |
| **Flood Control (Section 3.3.1)** | Insufficient flood protection along entire 16 miles of project area may impact personal safety and property; failure to meet FEMA criteria | Increased flood protection and levee certification for westernmost 3 miles; Insufficient flood protection may impact personal safety and property and failure to meet FEMA criteria along remaining length | Increased flood protection and levee certification along entire 16 miles of project area |
| **Water Quality (Section 3.3.2)** | None | Short-term negligible impacts from potential erosion and runoff during construction | Short-term negligible impacts from potential erosion and runoff during construction |
| **Land Use (Section 3.4)** | | | |
| **Natural Resources Management Areas (Section 3.4.1)** | None | Vegetation removal impacts to 3.7 acres of de facto wildlife travel corridor | Vegetation removal impacts to 7.4 acres of USFWS LRGVNWR tracts (3.7 acres disturbed levee; 3.7 acres woodland) and 8.3 acres of de facto wildlife travel corridor |

**Table 2-1: Summary of Environmental Impacts of Proposed Arroyo Colorado South Levee Improvements (Continued)**

| Resource Area | Environmental Impacts | | |
|---|---|---|---|
| | **No Action Alternative** | **Alternative 1: Levee Rehabilitation – 3 miles** | **Alternative 2: Levee Rehabilitation – 16 miles (Preferred Alternative)** |
| **Land Use (Section 3.4)** | | | |
| **Agricultural Land and Rangeland (Section 3.4.2)** | None | Impacts to 12 acres of agricultural land from vegetation removal; no prime or unique farmlands present | Impacts to 28 acres of agricultural land and 34 acres of rangeland from vegetation removal; temporary impacts to 2.5 acres of prime farmland soils in Cameron County |
| **Residential Properties (Section 3.4.3)** | Insufficient flood protection for entire 16 miles of ACS | Increased flood protection for westernmost 3 miles of ACS project; Insufficient flood protection for remaining residential properties | Increased flood protection for entire 16 miles of ACS project |
| **Commercial Properties (Section 3.4.4)** | None | None | Temporary negligible impacts to commercial properties from traffic; Impacts to approximately 7 acres of commercial property from levee expansion |
| **Community Resources (Section 3.5)** | | | |
| **Socioeconomics (Section 3.5.1)** | Benefits provided from routine levee maintenance | Temporary influx of employment, business sales volume, and income; no new jobs created; benefits from routine levee maintenance | Temporary influx of employment, business sales volume, and income; no new jobs created; negligible impacts to commercial properties; benefits from routine levee maintenance |
| **Environmental Justice (3.5.2)** | Environmental justice issues may arise from insufficient flood protection along entire length of ACS | Benefit to westernmost 3 miles of ACS from flood protection; environmental justice issues may arise from insufficient flood protection along remaining length | Benefit to entire length of ACS from flood protection |

**Table 2-1: Summary of Environmental Impacts of Proposed Arroyo Colorado South Levee Improvements (Continued)**

| Resource Area | Environmental Impacts | | |
|---|---|---|---|
| | **No Action Alternative** | **Alternative 1: Levee Rehabilitation – 3 miles** | **Alternative 2: Levee Rehabilitation – 16 miles (Preferred Alternative)** |
| **Community Resources (Section 3.5)** | | | |
| **Transportation (3.5.3)** | None | Temporary impacts from construction traffic | Temporary impacts from construction traffic |
| **Environmental Health (Section 3.6)** | | | |
| **Air Quality (Section 3.6.1)** | None | Temporary negligible impacts | Temporary negligible impacts |
| **Noise (Section 3.6.2)** | None | Temporary negligible impacts | Temporary negligible impacts |
| **Hazardous Materials (Section 3.6.3)** | None | None | None |

# SECTION 3:

# AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The following section describes the current existing environmental conditions within the ACS project area, evaluates the potential direct and indirect environmental consequences that may result from implementation of Alternative 1, the Preferred Alternative, and the No Action alternative, and describes best management practices to prevent or minimize impacts to the environment. Direct impacts are defined as those that occur at the same time and place of the action while indirect impacts occur later in time or are farther removed in distance, but are still reasonably foreseeable. Analyses of impacts focus on natural and cultural resources within the ACS project area. Reference values for air quality, socioeconomics, and environmental justice are evaluated on a regional basis (county level).

Some environmental resources were excluded from review because they were not found to be present within the project area or are not anticipated to be affected by the proposed project. These include: wilderness areas, wild and scenic rivers, national natural landmarks, national monuments, forests, parks, coastal zones, offshore fisheries, geology, and displacement of persons. The following resource areas and issues are included in the evaluation:

- biological resources (vegetation, wetlands, wildlife, and threatened and endangered [T&E] species);
- cultural resources (archeological and architectural) and Native American consultation;
- water resources (flood control, floodplains, wetlands, and water quality);
- land use (natural resources management areas, agricultural land, prime and unique farmlands, commercial properties, and residential developments);
- community resources (socioeconomics, environmental justice, and transportation);
- environmental health (air quality, noise, and public health and environmental hazards); and
- environmental justice.

## 3.1 BIOLOGICAL RESOURCES

Information presented in this section was obtained from available USIBWC reports and studies conducted in and near the project area and information obtained during field surveys. General biological resources information was obtained from various state and federal agencies including, but not limited to, TPWD, USFWS, United States Department of Agriculture (USDA) NRCS, and the United States Army Corps of Engineers (USACE).

### 3.1.1 Vegetation

The ACS is within the Matamoran Biotic District subdivision of the Tamaulipan Biotic Province and is in a transition zone between temperate and tropical climates (Blair 1950). The native vegetation type covering much of southern Texas and northeastern Mexico is mesquite-grassland. The Tamaulipan thornscrub, a subtropical semi-arid vegetation type, occurs on both sides of the Rio Grande. Spiny shrubs and trees dominate this thornscrub, but grasses, forbs, and succulents are prominent (Crosswhite 1980). Exceptions to the arid shrub-covered landscapes are areas of dense riparian vegetation within the few river valleys. Species composition and distribution throughout the region usually are a function of soil and geological formations. Most of the natural vegetation in southern Hidalgo and Cameron counties has been replaced by cropland and urban development. Much of the off-river floodway system on the United States side is used for agriculture, including grain sorghum, cotton, and a variety of vegetables. A detailed description of regional vegetation is provided in the 2008 PEIS (USIBWC 2008).

The majority of land on both sides of the south levee in Hidalgo County and on the landside of the south levee in Cameron County is agricultural land. Many areas along the ACF in Cameron County are being used for commercial sand mining operations and are characterized by pioneering and invasive grasses and forbs. Several former levee borrow sites also are present along the ACS.

Based on literature review and information acquired during field surveys, herbaceous non-native grassland, old-field, woodland/thornscrub, wetland, riparian, rangeland, and agricultural vegetation communities were identified within the project area. Other areas such as borrow pits, open water (i.e., pond and stream habitat), developed land, and commercial properties also were identified within the project area.

The majority of vegetation along the landside border of the 16-mile project area is associated with the south levee drainage ditches, located between the south levee and adjacent agricultural lands. These drainage ditches typically consist of either herbaceous vegetation or a narrow band of woody vegetation that is associated with a de facto wildlife travel corridor that exists along much of the USIBWC landside levee right-of-way. (United States Fish and Wildlife Service [USFWS] 2003). The species compositions of the vegetation communities along the drainage ditches generally are similar to those of the vegetation communities in the surrounding area.

Two tracts of the Lower Rio Grande National Wildlife Refuge (LRGNWR) occur within the project area. One narrow tract occurs in a corridor on both sides of the Willacy Irrigation Canal, intersects the ACS approximately at levee mile 7 (see Appendix A, Figure A-3), and is associated with the irrigation canal riparian vegetation community. The second tract is located at levee mile 13 (see Appendix A, Figure A-4) and is associated with the woodland/thornbrush vegetation community. Vegetation characteristics of the region and the project area were characterized in the BE. The BE is provided as Appendix B of this EA.

***No Action Alternative***

Under the No Action Alternative, no changes to the levee system and no associated construction activities would occur. Routine maintenance activities still would occur. The plant communities along the ACS would remain as under present management. Vegetation diversity and composition is expected to remain the same, with no additional habitat created within the project area.

***Alternative 1: Levee Rehabilitation – 3 miles***

Under Alternative 1, levee construction activities would affect vegetation communities along the westernmost 3 miles of the ACS project area through vegetation removal and fill activities. Impacts would occur on the levee slopes and on adjacent, narrow strips of land for levee expansion where fill would be added along the riverside and landside of the levee. However, in order to minimize impacts, the riverside edge of the existing de facto wildlife corridor would serve as the limits of construction for the landside of the levee, to the maximum extent practicable. Any construction within the de facto wildlife corridor would be coordinated with the USFWS and no trees within the de facto wildlife corridor would be cleared without prior approval of the USFWS.

The vegetation communities impacted would include the non-native grass-covered slopes of the existing levee (28 acres), adjacent agricultural land (12 acres), and riparian vegetation associated with drainage ditches (0.1-acre) and the de facto wildlife travel corridor (3.7 acres). Vegetation community acreages impacted under Alternative 1 are presented in Table 3-1.

Following levee construction activities, unless otherwise requested by landowner(s), the disturbed ROW would be revegetated with a native plant species seed mixture appropriate for the land type as soon as possible after project completion. Prompt application of native vegetation would allow for efficient establishment and would provide additional erosion control.

In accordance with the *Migratory Bird Treaty Act* (MBTA), the removal of trees and clearing of the ROW either would be conducted outside of the breeding season of the bird species in this area (March through August) or the ROW would be surveyed for active nests to ensure the preservation of the nests. Additionally, vegetation management of the project area would be in accordance with the Presidential Memorandum on Environmentally Beneficial Landscaping (1994) and Executive Order 13112 on Invasive Species (1999), which would include the use of regionally native vegetation for landscaping and USIBWC Environmental Management approved seed mixes.

***Alternative 2 (Preferred Alternative): Levee Rehabilitation – 16 miles***

Levee construction activities would affect vegetation communities along the entire ACS project area through vegetation removal and fill activities. Impacts would occur on the levee slopes and adjacent, narrow strips of land for expansion where fill would be added along the riverside and landside of the levee. However, in order to minimize impacts, the riverside edge of the existing wildlife corridor would serve as the limits of construction for the landside of the levee, to the maximum extent practicable. Any construction within the de facto wildlife corridor would be

coordinated with the USFWS and no trees within the de facto wildlife corridor would be cleared without prior approval of the USFWS. In addition, no construction activities would occur within the LRGNWR tract near levee mile 7. Construction activities along the LRGNWR tract near levee mile 13 would be limited to the riverside of the levee only. As with the de facto wildlife corridor, all construction activities within the LRGNWR tract would be coordinated with the USFWS. USIBWC would compensate the loss of woodland/thornscrub habitat on a 3:1 acre basis (3 acres protected for every 1 acre disturbed) and riparian habitat on a 1:1 acre basis. Land of equal value would be compensated under conservation easement, land acquisition, or monetary payment.

The vegetation communities/habitat types impacted would include the non-native grass-covered slopes of the existing levee (147 acres), adjacent rangeland (34 acres), agricultural land (28 acres), woodland/thornscrub (14.7 acres; including the LRGNWR tract near levee mile 13 [3.7 acres]), borrow pits (2 acres), old-field communities (0.8-acre), riparian vegetation associated with the de facto wildlife travel corridor (8.3 acres), drainage ditches (0.8-acre), and irrigation canals (0.2-acre). The vegetation associated with the USFWS LRGNWR tract within the project area is similar in composition to adjacent low quality habitat of the levee slopes. Vegetation community acreages impacted under the Preferred Alternative are presented in Table 3-1.

**Table 3-1: Acreages of Vegetation Impacts from Alternative 1 and the Preferred Alternative**

| Vegetation Community | Alternative 1 Impacts from Levee Rehabilitation – 3 miles (acres) | Percentage of 3 miles of the Floodway Impacted (%)[1] | Preferred Alternative Impacts from Levee Rehabilitation – 16 miles (acres) | Percentage of 16 miles of the Floodway Impacted (%)[2] |
|---|---|---|---|---|
| Herbaceous | 28 | 6.3 | 147 | 6.2 |
| Old-field | -- | -- | 0.8 | 0.03 |
| Woodland/Thornscrub | -- | -- | 14.7[3] | 0.6 |
| Borrow Pits | -- | -- | 2 | 0.08 |
| Rangeland | -- | -- | 34 | 1.4 |
| Agricultural Land | 12 | 2.7 | 28 | 1.2 |
| Riparian | 3.8[4] | 0.9 | 9.3[5] | 0.4 |
| Wetlands | -- | -- | -- | -- |
| Total | 43.8 | 10.0 | 235.8 | 9.9 |

1. Calculated acreage of 3 miles of the floodway is assumed to be 440 acres based on aerial interpretation.
2. Calculated acreage of 16 miles of the floodway is assumed to be 2,371 acres based on aerial interpretation.
3. Includes the USFWS LRGNWR tract near levee mile 13.
4. Riparian communities include vegetation associated with the drainage ditches and de facto wildlife travel corridor.
5. Riparian communities include vegetation associated with the drainage ditches, irrigation canals, and the de facto wildlife travel corridor.

Following levee construction activities, unless otherwise requested by landowner(s), the disturbed ROW would be revegetated with a native plant species seed mixture appropriate for the land type as soon as possible after project completion. Prompt application of native vegetation would allow for efficient establishment and provide additional erosion control.

In accordance with the MBTA, the removal of trees and clearing of the ROW either would be conducted outside of the breeding season of the bird species in this area (March through August) or the ROW would be surveyed for active nests to ensure the preservation of the nests. Additionally, vegetation management of the project area would be in accordance with the Presidential Memorandum on Environmentally Beneficial Landscaping (1994) and Executive Order 13112 on Invasive Species (1999) which would include the use of regionally native vegetation for landscaping and in seed mixes.

### 3.1.2 Wetlands and Waterbodies

Wetlands perform valuable functions in restoring and maintaining the quality of the nation's waters. These functions include floodwater storage, sediment trapping, nutrient removal, chemical detoxification, aquatic food chain support, fish and wildlife habitat, and groundwater recharge. Over the past several centuries, the Rio Grande has meandered across its lower floodplain near the Gulf of Mexico. Geological remnants of this process include isolated oxbow lakes (i.e., resacas), linear channel segments, and small pools associated with the historic river channel. Over time, these wetland areas developed into habitats of unique value that often support water-tolerant woody species along the wetland fringes. Resacas contribute to high biodiversity in the Lower Rio Grande Valley (LRGV) and provide important habitat for migratory birds and resident wildlife. In addition to wetlands, there are other manmade waters including settling basins, ditches, canals, reservoirs, and lakes throughout the project area region. Although these manmade waters primarily were designed for flood control and irrigation purposes, they often are lined with vegetation that supports wildlife and serve as travel corridors for some species.

An on-site determination and delineation of jurisdictional waters of the U.S. within the project area was conducted by TRC Environmental Corporation (TRC) in February 2010. Wetlands and waterbodies within the project area were identified and characterized in the BE (Appendix B) and the Waters of the U.S. Delineation Report (Appendix C). Figures presenting wetlands, waterbodies, and the de facto wildlife travel corridor located within the project area are included in the Waters of the U.S. Delineation Report.

Wetlands and waterbodies within the ACS survey area can be classified into two systems: palustrine and riverine. *Palustrine systems* are all nontidal wetlands dominated by trees, shrubs, and other vegetation. Small palustrine systems associated with low-lying areas, including former levee borrow sites, exist in the survey area. *Riverine systems* are all wetlands and deepwater habitats within a river channel.

One 0.1-acre non-jurisdictional palustrine wetland was identified within the construction corridor between levee miles 15 and 16 in Cameron County (Appendix A; Figure A-5). This wetland is

located on the riverside of the south levee and is associated with a former levee borrow site that supports emergent hydrophytic vegetation.

Waterbodies within the ACS project area primarily are associated with agricultural drainage ditches and irrigation canals. These small riverine systems are associated with riparian vegetation. Most drainage ditch slopes are relatively steep, limiting the lateral extent of riparian vegetation along the ditches. Many of the agricultural drainage ditches have moderate to severe erosion, with some slopes supporting little to no vegetation. These drainage ditches typically are seasonally to temporarily flooded and receive surface and subsurface water from agricultural fields. Three of the drainage ditches contain open deepwater (i.e., pond and stream) habitat. The irrigation canals contain open deepwater habitat and support herbaceous vegetation.

In a letter dated May 25, 2010 (Appendix D), the USACE – Galveston District identified waters of the U.S. subject to USACE jurisdiction in seven distinct locations within the project area.

***No Action Alternative***

Under the No Action Alternative, no changes to the levee system and no associated construction activities would occur. Wetland vegetation would not be cleared and no fill material would be added to areas containing wetlands. No additional wetlands would be created within the project area.

***Alternative 1: Levee Rehabilitation – 3 miles***

Levee construction activities would not impact any wetlands because no wetlands occur within the 3 miles proposed for rehabilitation. Riparian vegetation communities associated with the drainage ditches (0.1 acres) and the de facto wildlife travel corridor (3.7 acres) would be impacted under Alternative 1. Impacts would occur through vegetation removal and fill activities on adjacent, narrow strips of land for levee expansion. However, it is anticipated that the impacted areas associated with the drainage ditches would eventually recolonize with riparian vegetation. No waters of the U.S. were identified by the USACE within the 3 miles proposed for rehabilitation.

***Alternative 2 (Preferred Alternative): Levee Rehabilitation – 16 miles***

Construction activities under the Preferred Action would impact riparian vegetation communities associated with the irrigation canals (0.2-acre), drainage ditches (0.8-acre), and de facto wildlife travel corridor (8.3 acres). No construction activities would occur within the 0.1-acre non-jurisdictional wetland. Impacts would occur through vegetation removal and fill activities on the adjacent, narrow strip of land required for levee expansion activities. It is anticipated that the impacted areas associated with the irrigation canals, drainage ditches, and the de facto wildlife travel corridor would eventually recolonize with riparian vegetation. Any construction activities within the areas identified by the USACE as waters of the U.S. (Appendix D) would require permitting and authorization by the USACE – Galveston District prior to construction.

USIBWC would compensate the loss of riparian habitat on a 1:1 acre basis. Land of equal value would be compensated under conservation easement, land acquisition, or monetary payment.

### 3.1.3 Wildlife

Common wildlife species in the region include whitetail deer, turkey, javelina, bobwhite quail, scaled quail, white-winged dove, mourning dove, cottontail rabbit, jackrabbit, various waterfowl species, and many species of reptiles, amphibians, and nongame birds and mammals. The region also provides important wintering habitat for thousands of migratory birds, including many species of passerines, raptors, shorebirds (e.g., sandhill cranes), ducks, and geese. In addition, a number of unique and rare animals occur in the region (Section 3.1.4). Many of the terrestrial wildlife species in the project area are limited in their distribution either partially or entirely to the Tamaulipan Biotic Province, with some only found in the LRGV. A detailed description of wildlife within the region and project area is provided in the BE in Appendix B of this EA.

***No Action Alternative***

Under the No Action Alternative, no changes to the levee system would occur, resulting in no associated construction activities. No construction related disturbances to wildlife would occur. Habitat would not be disturbed or created. Routine maintenance activities would still occur.

***Alternative 1: Levee Rehabilitation – 3 miles***

The project area is composed primarily of regularly maintained or cultivated areas that provide relatively low quality habitat for most wildlife species. It is anticipated that most species present would move to adjacent, undisturbed areas during construction and rapidly recolonize the area after the work is completed and after the vegetation has been re-established. Some species, particularly burrowing species, would be impacted during construction activities.

Levee expansion activities under Alternative 1 would impact approximately 3.7 acres of vegetation associated with the de facto wildlife travel corridor along the landside drainage ditches. In order to minimize impacts, the riverside edge of the existing wildlife corridor would serve as the limits of construction for the landside of the levee, to the maximum extent practicable. Any construction within the de facto wildlife corridor would be coordinated with the USFWS and no trees within the de facto wildlife corridor would be cleared without prior approval of the USFWS. Coordination measures may include, but are not limited to, removal of vegetation during nonbreeding seasons, selective vegetation removal, revegetation with native trees or shrubs, and avoidance. It is anticipated that any vegetation disturbed within the de facto wildlife travel corridor would eventually recolonize.

The removal of trees and clearing of the ROW would be conducted outside of the migratory bird breeding season or the ROW would be surveyed for active nests prior to construction to ensure the preservation of the nests. If active nests are found during the survey, construction would not occur in the vicinity until the offspring fledge or the nest fails or is abandoned.

***Alternative 2 (Preferred Alternative): Levee Rehabilitation – 16 miles***

The project area is composed primarily of regularly maintained or cultivated areas that provide relatively low quality habitat for most wildlife species. Areas of levee slopes that are infrequently maintained, typically found along some segments in Cameron County, support

young, woody vegetation such as honey mesquite (*Prosopis glandulosa*), retama (*Parkinsonia aculeata*), and lotebush (*Ziziphus obtusifolia*), providing somewhat higher quality habitat. Several areas along the levee in Cameron County consist of woodland/thornbrush and rangeland communities that also provide higher quality habitat. However, it is anticipated that the wildlife species present would move to adjacent, undisturbed areas during construction and rapidly recolonize the area after the work is completed and after the vegetation has been re-established. Some species, particularly burrowing species, would be impacted during construction activities.

In order to minimize impacts, the riverside edge of the existing wildlife corridor would serve as the limits of construction for the landside of the levee, to the maximum extent practicable. Any construction within the de facto wildlife corridor would be coordinated with the USFWS and no trees within the de facto wildlife corridor would be cleared without prior approval of the USFWS. In addition, no construction activities would occur within the LRGNWR tract near levee mile 7. Construction activities along the LRGNWR tract near levee mile 13 would be limited to the riverside of the levee only. As with the de facto wildlife corridor, all construction activities within the LRGNWR tract would be coordinated with the USFWS.

Levee expansion activities under the Preferred Alternative would impact approximately 8.3 acres of vegetation associated with the de facto wildlife travel corridor along the landside drainage ditches. Approximately 7.4 acres (3.7 acres of disturbed levee and 3.7 acres of woodland/thornscrub habitat) of the riverside of the LRGNWR tract near levee mile 13 would be impacted by levee construction activities. In addition, USIBWC would work in close coordination with the USFWS to develop measures to minimize impacts to the de facto wildlife travel corridor, LRGNWR tracts, and wildlife. These measures may include, but are not limited to, removal of vegetation during nonbreeding seasons, selective vegetation removal, revegetation with native trees or shrubs, and avoidance. It is anticipated that any vegetation disturbed within the de facto wildlife travel corridor and LRGNWR tracts would eventually recolonize.

In addition, USIBWC would compensate the loss of woodland/thornscrub habitat on a 3:1 acre basis and riparian habitat on a 1:1 acre basis. Land of equal value would be compensated under conservation easement, land acquisition, or monetary payment.

The removal of trees and clearing of the ROW would be conducted outside of the migratory bird breeding season or the ROW would be surveyed for active nests prior to construction to ensure the preservation of the nests. If nests are found during the survey, construction would not occur in the vicinity until the offspring fledge or the nest fails or is abandoned

### 3.1.4 Threatened and Endangered Species

The *Endangered Species Act of 1973* gives the USFWS federal legislative authority for the protection of T&E species. This protection includes a prohibition of direct take (i.e., killing, harassing) and indirect take (i.e., destruction of critical habitat). The Texas Parks and Wildlife Code also has established a state regulatory mandate for protection of state-listed T&E species by prohibiting the take of such species.

Fifty-four federally or state-listed T&E species potentially occur within Hidalgo and Cameron counties. Nine of the 18 federally listed species for Hidalgo and Cameron counties are not

expected to occur within or adjacent to the project area because of the absence of suitable habitat, and three are not expected to occur within or adjacent to the project area because they are considered extirpated. The remaining six federally listed T&E species may occur within the proposed project area, and thus may be impacted by construction and operation of the proposed project (Table 3-2). Twenty-five of the 54 state-listed species have suitable habitat within the project area. Detailed species and habitat descriptions are provided in the BE in Appendix B of this EA.

**Table 3-2: Federally Listed T&E Species with the Potential to Occur in the ACS Project Area**

| Species Common Name | Scientific Name | USFWS[1] | County[2] | Preferred Habitat in South Texas | Suitable Habitat in Project Area? |
|---|---|---|---|---|---|
| **Wildlife** | | | | | |
| Northern aplomado falcon | *Falco femoralis septentrionalis* | LE | C, H | Inhabits open grasslands and savannas containing tall cacti, tree yuccas, and open stands of tall pines and oaks | Yes |
| Piping plover | *Charadrius melodus* | LT | C | Wintering migrant along the Texas Gulf coast; found on beaches and bayside mud- or saltflats | Yes |
| Jaguarundi | *Herpailurus yaguarondi* | LE | C, H | Inhabits thick, dense thorny brush and shrubland | Yes |
| Ocelot | *Leopardus pardalis* | LE | C, H | Inhabits thick, dense thorny brush and shrubland | Yes |
| **Plants** | | | | | |
| South Texas ambrosia | *Ambrosia cheiranthifolia* | LE | C | Occurs at low elevations in open clay-loam to sandy-loam prairies and savannas; only known from Kleburg and Nueces Counties, Texas | Yes |
| Texas ayenia | *Ayenia limitaris* | LE | C, H | Occurs at low elevations in dense subtropical woodland communities; prefers well-drained, heavy soils on riparian terraces with close to 95% canopy cover. | Yes |

[1] - U.S. Fish and Wildlife Service (USFWS): LE = endangered, LT = threatened
[2] - C = Cameron County, H = Hidalgo County
Source: USFWS 2010

***No Action Alternative***

Under the No Action Alternative, improvements to the ACS and associated construction activities would not occur. Existing vegetation communities and habitat, including the de facto wildlife travel corridor and two USFWS LRGNWR tracts, would not be cleared for levee expansion, nor would additional habitat be created within the project area. Routine maintenance activities would remain unchanged.

***Alternative 1: Levee Rehabilitation – 3 miles***

Under Alternative 1, levee construction activities would remove primarily herbaceous, non-native grassland communities along the levee slopes, as well as agricultural land and approximately 0.1-acre of riparian habitat associated with the drainage ditches and 3.7 acres of higher quality habitat associated with the de facto wildlife travel corridor. In order to minimize impacts, the riverside edge of the existing wildlife corridor would serve as the limits of construction for the landside of the levee, to the maximum extent practicable. Any construction within the de facto wildlife corridor would be coordinated with the USFWS and no trees within the de facto wildlife corridor would be cleared without prior approval of the USFWS. Construction impacts would be temporary and localized to narrow strips adjacent to the existing levee. Routine maintenance activities would remain unchanged. Due to the marginal habitat impacted and the temporary nature of the impacts, it is determined that the construction and operation activities associated with Alternative 1 are not likely to adversely affect the six federally listed species with potential to occur in the project area (Table 3-1).

The contractor would provide a qualified environmental monitor to survey for T&E species to ensure the prevention of direct or indirect take of any federally or state-listed species. The environmental monitor also would survey for birds protected under the *Migratory Bird Treaty Act of 1918* to prevent destruction of nests or eggs during construction activities.

***Alternative 2 (Preferred Alternative): Levee Rehabilitation – 16 miles***

Under the Preferred Alternative, levee construction activities would remove primarily herbaceous non-native grassland communities along the levee slopes, as well as some areas of agricultural land, rangeland, old-field communities, thornbrush/woodlands, and riparian habitat associated with irrigation canals and the drainage ditches. Construction impacts would be temporary and localized to narrow strips adjacent to the existing levee. In order to minimize impacts, the riverside edge of the existing wildlife corridor would serve as the limits of construction for the landside of the levee, to the maximum extent practicable. In addition, no construction activities would occur within the LRGNWR tract near levee mile 7. Construction activities along the LRGNWR tract near levee mile 13 would be limited to the riverside of the levee only. As with the de facto wildlife corridor, all construction activities within the LRGNWR tract would be coordinated with the USFWS.

Higher quality habitat associated with the de facto wildlife travel corridor (8.3 acres) and the USFWS LRGNWR tract near levee mile 13 (3.7 acres of disturbed levee and 3.7 acres of woodland/thornscrub habitat) would be impacted. However, USIBWC would work in close

coordination with the USFWS to develop measures to minimize impacts to the de facto wildlife travel corridor, USFWS LRGNWR tracts, and T&E species. USIBWC would compensate the loss of woodland/thornscrub habitat on a 3:1 acre basis and riparian habitat on a 1:1 acre basis. Land of equal value would be compensated under conservation easement, land acquisition, or monetary payment. Routine maintenance activities would remain unchanged. Due to the marginal habitat impacted and the temporary nature of the impacts, it is determined that the construction and operation activities associated with Preferred Alternative are not likely to adversely affect the six federally listed species (Table 3-1). In a letter dated November 5, 2010, the USFWS concurred with this finding.

The contractor would provide a qualified environmental monitor to survey for T&E species to ensure the prevention of direct or indirect take of any federally or state-listed species. The environmental monitor also would survey for birds protected under the *Migratory Bird Treaty Act of 1918* to prevent destruction of nests or eggs during construction activities.

## 3.2 CULTURAL RESOURCES

Cultural resources are prehistoric and historic archeological sites, structures, districts, artifacts, and/or any material that has been made or modified through past human activity that embodies cultural significance. In this document, cultural resources refers specifically to prehistoric and historic archeological sites, the materials associated with those and historic architectural resources.

The proposed undertaking represents a federally sponsored project on private lands and has the potential for impacting cultural resources that may lie within the Area of Potential Effect (APE). A cultural resource evaluation of the proposed APE is required to meet legal responsibilities under existing federal and state guidelines, including Sections 106 and 110 of the National Historic Preservation Act (NHPA) of 1966 (PL89-665; 80 Stat. 915; 16 USC §4221 et seq.); Executive Order Number 11593 of 1971; The Archeological and Historic Preservation Act (AHPA) of 1974 (P.L. 93-291; 88 Stat. 174; 16 USC §469 et seq.); the American Indian Religious Freedom Act (AIRFA) of 1978 (P.L. 95-341; 92 Stat. 469; 42 USC §12996); and the Native American Graves Repatriation Act (NAGPRA) of 1990 (P.L. 101-601; 104 Stat. 3048; 25 USC §3001 et seq.).

### 3.2.1 Previous Cultural Resources Studies

Four investigations were previously conducted to identify cultural resources in portions of the ACS project area. In 1991, the USACE conducted a cultural resources survey, which included part of the ACS project APE, from the intersection of the USIBWC Divisor Dike and North levee east to the Mercedes Main Canal (USACE 1991). The survey consisted of a pedestrian and boat survey of the Arroyo Colorado channel and areas likely to be impacted by the planned irrigation structure construction and channel improvement in the form of the examination of large stratigraphic exposures along the banks of the Arroyo Colorado. No cultural resources were identified as part of this investigation within the ACS project APE (Good 1991).

In 2002, Geo-Marine, Inc., for Wendy Lopez and Associates, conducted an assessment of effects that USIBWC maintenance activities would have on cultural resources, in support of an USACE

Environmental Impact Statement for the LRGFCP (Geo-Marine, Inc. 2003). This study area included the ACS project APE, but survey methods for this portion of the project area included only field reconnaissance, archival research and a geoarcheological study, including 60 backhoe trenches. The study identified two archeological sites (41HG170 and 41HG174) and an area of high probability (NF6) within the vicinity of, but outside the ACS project APE (Geo-Marine, Inc. 2003). NF6, a scatter of late 19$^{th}$ century glass and ceramics, occurs to the west and outside of the ACS project APE on a promontory east of the confluence of the Arroyo Colorado and Arroyo Anacuitas, near Mercedes, Texas.

An archeological resources survey was completed in 2004 by American Archaeology Group, LLC for Wright Way Construction, Inc. (American Archaeology Group, LLC 2004). The report for this project provides an analysis of the eastern-most portion of the ACS project area, between the approximate location of ACS project mile marker 11.5 and White Ranch Road, La Feria, Texas. This investigation included a site files search, intensive survey of 20 acres of land (shovel testing) and nine backhoe trenches, totaling 180-meters in length, were excavated to a depth of 2.5 to 3.5 meters (American Archaeology Group, LLC 2004). These subsurface investigations yielded no evidence of buried cultural resources and indicated heavy plow disturbance to a depth of 50 centimeters. American Archaeology Group, LLC (2004) indicate that two archeological sites (41CF180 and 41CF181) were recorded just north of the American Archaeology Group, LLC project boundary and were discovered through surface inspection, not subsurface investigations. These two sites are located within a one-mile radius of the ACS project APE.

A cultural resources intensive survey was conducted by Parsons with personnel from Panamerican Consultants, Inc., in support of an EA for the USIBWC, for proposed flood containment capacity of the improvements to segments of the existing Divisor Dike and ACF project areas (USIBWC 2009a). The project area included 2.1-miles of the Divisor Dike and the upper 8.9-miles of the Arroyo Colorado North Levee near the municipalities of Weslaco, Mercedes and La Feria, Texas. Data collection methods for this project also included a site file search, an architectural survey within the North Levee project APE, the systematic shovel testing of the entire 12-mile APE, and the reassessment of two previously recorded archeological sites (Ebony Grove Cemetery and Site 41CF181). The architectural survey identified forty historic-age or unknown-age architectural resources. Three of these resources were determined eligible for the National Register for Historic Places (NRHP). These were the earthen structures, including the North Levee, the Divisor Dike, and the Pilot Channel. Leonard identified four previously unrecorded sites. The sites are briefly described as follows.41HG231, 41HG232, 41CF209, and 41CF210 (USIBWC 2009a). None of these sites fall within the South Levee project APE.

### 3.2.2 Archeological Resources

TRC archaeologists consulted the Texas Historical Commission's (THC) Archeological Sites Atlas to determine if there were prehistoric or historic archeological sites located within the study area. Six archeological sites were previously recorded within this radius. However, none of these sites occurs within the current APE. Between March 15, 2010 and March 19, 2010, TRC cultural resources staff performed a Phase I cultural resources survey. Work involved both

the trenching and pedestrian survey of six selected High Probability Areas (HPAs) along approximately 16 miles of the ACS ROW in Cameron and Hidalgo counties, Texas.

The pedestrian survey was conducted to provide an overview and determine any areas of obvious localized disturbance prior to mechanical trenching, as well as to look for surface features and cultural materials. Shovel testing, given the deep and widespread extent of alluvial sediments, was considered ineffective in archeological site detection by the THC and, therefore, was not included in the work plan for this investigation (USIBWC 2010).

All excavated trenches were placed outside of the ACS levee toe slope. Specifically, one backhoe trench was excavated within four of the six designated HPAs. Two of the six HPAs were selected and subjected to a minimum of two trenches. Each backhoe trench had an approximate width of 5 feet (1.5 meters), and an approximate depth range of 5 to 6 feet (1.7 to 2 meters), and excavated in accordance with Occupational Safety and Health Administration (OSHA) regulations.

Eight mechanical trenches were positioned along the ACS project APE within the six pre-determined HPAs approved by the THC. Although trenches penetrated into Late Pleistocene to Early Holocene deposits, no cultural deposits were observed in any of the excavated trenches.

***No Action Alternative***

Under the No Action alternative, the current levee configuration would be retained. Routine maintenance activities would still occur. No adverse effects to archeological resources would be anticipated.

***Alternative 1: Levee Rehabilitation – 3 miles***

Due to the extensive disturbance of the westernmost 3 miles by modern farming practices, no HPAs were selected within the project area under Alternative 1. No adverse effects to archeological resources would be anticipated.

In the event that any human remains or burial furniture are encountered during construction, all work would cease and law enforcement and the THC would be notified.

***Alternative 2 (Preferred Alternative): Levee Rehabilitation – 16 miles***

Potential impacts to archeological resources include the disturbance of surface and shallow subsurface materials through the movement and use of heavy machinery adjacent to the existing levee within the APE. Other impacts may include the deep burying of materials (surface and sub-surface) with capping fill that exceeds 6.6 feet (2 meters) in depth and routine maintenance activities.

Examination of existing site records indicates that there are multiple recent archeological projects within and near the project area. However, upon the investigation of six HPAs within the APE through pedestrian survey and mechanical trenching, no archeological resources were observed during the excavation of a series of exploratory trenches within the APE. Given these

data, no adverse effects to archeological resources would be anticipated from construction activities associated with the Preferred Alternative. No consideration is needed for nomination of this area to the NRHP.

In the event that any human remains or burial furniture are encountered during construction, all work would cease and law enforcement and the THC would be notified.

### 3.2.3 Architectural Resources

An architectural survey of historic structures was performed along the 16 miles of the ACS ROW. In all, 83 resources or groups of resources were identified, documented, and assessed for NRHP eligibility. TRC documented both historic age (45 years or older) and non-historic properties within the APE. Of the 83 identified resources, 10 are potentially eligible for individual listing in the NRHP, while 56 are not individually eligible but would be considered contributing elements of the district. The 17 remaining resources were deemed non-historic or lacking sufficient integrity and, thus, ineligible for NRHP either as an individual property or as a contributing element of a historic district. Table 3-3 presents a summary of the architectural resources identified within the APE.

**Table 3-3: Architectural Resources in the Area of Potential Effect**

| Resource Type | Quantity |
|---|---|
| Bridge | 1 |
| Building | 8 |
| Canal | 3 |
| Drain | 1 |
| Pump Station | 1 |
| Gate Well | 25 |
| Head Wall | 1 |
| Irrigation Gate | 1 |
| Screw Gate | 2 |
| Siphon | 1 |
| Standpipe | 12 |
| Take-Out Gate | 4 |
| Other (fence, culvert) | 23 |
| *Total* | *83* |

***No Action Alternative***

Under the no action alternative, the current levee configuration would be retained. Routine maintenance activities would still occur. No adverse effects to architectural resources would be anticipated.

***Alternative 1: Levee Rehabilitation – 3 miles***

Impacts that may occur to architectural resources within the APE may include the alteration of architectural traits by modification of existing structures, structural instability to existing structures from earth movement and/or vibration of heavy machinery. These aspects can affect the physical integrity of an NRHP-eligible or potentially eligible architectural resource, which would result in the loss of those characteristics that make it potentially eligible for nomination to the NRHP.

A survey of the architectural resources for NRHP eligibility documented 14 identified resources along the westernmost 3 miles of the ACS. One of these is potentially eligible for individual listing in the NRHP, while six are not individually eligible but would be considered contributing elements of the district. The seven remaining resources were deemed non-historic or lacking sufficient integrity and, thus, ineligible for NRHP either as an individual property or as a contributing element of a historic district. USIBWC would work in close coordination with the THC to develop measures to minimize impacts to NRHP-eligible resources.

***Alternative 2 (Preferred Alternative): Levee Rehabilitation – 16 miles***

Impacts that may occur to architectural resources within the APE may include the alteration of architectural traits by modification of existing structures, structural instability to existing structures from earth movement and/or vibration of heavy machinery. These aspects can affect the physical integrity of an NRHP-eligible or potentially eligible architectural resource, which would result in the loss of those characteristics that make it potentially eligible for nomination to the NRHP.

A survey of the architectural resources for NRHP eligibility documented 83 identified resources along the entire 16 miles of the ACS. Eleven of these are potentially eligible for individual listing in the NRHP, while 56 are not individually eligible but would be considered contributing elements of the district. The 17 remaining resources were deemed non-historic or lacking sufficient integrity and, thus, ineligible for NRHP either as an individual property or as a contributing element of a historic district. USIBWC would work in close coordination with the THC to develop measures to minimize impacts to NRHP-eligible resources.

### 3.2.4 Native American Resources

Native American resources are sites, areas, and materials important to Native Americans for heritage or religious reasons. Resources may include prehistoric sites and artifacts, contemporary sacred areas, traditional use areas (e.g., native plant or animal habitat), sources used in the production of sacred objects and traditional implements, or traditional cultural properties. Sacred places important to religion may also be present and include mountain peaks,

springs, and burial sites. Traditional rituals may prescribe the use of particular native plants, animals, or minerals from specific places. Therefore, activities that may affect sacred areas, their accessibility, or the availability of materials used in traditional practices may be of concern.

Impacts to Native American resources include destruction of traditional resources, burials, and sacred sites, and plant or animal habitat through ground-disturbing activities such as riverbed dredging and levee reconstruction. Audio and visual intrusion may adversely affect the visual and audio landscape or the viewshed of these resources as well as disturb any associated ceremonial activities. These types of physical disturbance may disturb or destroy unidentified Native American resources.

Based on previous USIBWC reports, no resources or concerns to Native American Tribes have been identified in nearby project areas (USIBWC 2007, 2009b). However, Native American consultation has been initiated by the USIBWC, pursuant to 36 Code of Federal Regulations CFR 800.2, with the Comanche Nation and Kiowa Tribe of Oklahoma to identify any Native American resources or concerns.

***No Action Alternative***

Under the no action alternative, the current levee configuration would be retained. Routine maintenance activities would still occur. No Native American resources would be affected.

***Alternative 1: Levee Rehabilitation – 3 miles***

Although no resources or concerns to Native American Tribes have previously been identified, it is possible that activities related to levee improvements along the westernmost 3 miles ACS would result in limited access to sites and resources within the floodway during construction activities. However, construction activities would be temporary and localized and access would not be prevented during construction activities. It is also possible that expanding the footprint could cover unrecorded resources of interest to Tribes and would result in adverse effects to resource accessibility for Native Americans. However, Tribes have previously indicated no concerns regarding resources in nearby project areas (USIBWC 2007, 2009b). Routine maintenance activities similar to the present would occur.

***Alternative 2 (Preferred Alternative): Levee Rehabilitation – 16 miles***

Although no resources or concerns to Native American Tribes have previously been identified, it is possible that activities related to levee improvements along 16 miles ACS would result in limited access to segments of the Arroyo Colorado and sites and resources within the floodway during construction activities. However, construction activities would be temporary and localized and access would not be prevented during construction activities. It is also possible that expanding the footprint could cover unrecorded resources of interest to Tribes and would result in adverse effects to resource accessibility for Native Americans. However, Tribes have previously indicated no concerns regarding resources in nearby project areas (USIBWC 2007, 2009b). Routine maintenance activities similar to the present would occur.

## 3.3 WATER RESOURCES

### 3.3.1 Flood Control

The United States and Mexico reached an agreement in 1932 to develop a coordinated plan for an international project in the LRGV to protect lands adjacent to the Rio Grande from flooding. The result of the agreement was the LRGFCP, which is designed for flood protection of urban, suburban, and highly developed croplands. The ACS, a component of the LRGFCP, extends through primarily agricultural lands from Progreso in Hidalgo County to the intersection of Parker Road and Abd Road near Harlingen in Cameron County. Numerous irrigation and drainage canals intersect the levee along the length of the system.

The need for improvement to the ACS system was determined by the USIBWC via hydraulic monitoring of the LRGFCP. Portions of the current ACS system do not meet the design criteria for the design 100-year flood event. The design flood for the LRGFCP is based on a peak flow of 21,000 cubic feet per second (cfs) along the Arroyo Colorado (USIBWC 2003).

Perennial flow in the Arroyo Colorado is sustained by municipal wastewater point sources, particularly during dry periods (TCEQ 2006). Additional sources of water in the Arroyo Colorado are agricultural return flows, storm water and urban runoff, and base flows from shallow groundwater. During nonflood conditions, irrigation/municipal water and local drainage flow into the floodways through irrigation and drainage structures.

The Arroyo Colorado eventually empties into the Laguna Madre north of the dredged Arroyo Colorado mouth. The Arroyo Colorado has a high channel bottom and therefore does not receive any flow from Llano Grande except during flood conditions. The flood control features at this site are used to divert a significant portion of floodwaters conveyed by the Main Floodway to the Arroyo Colorado during flood events (Figure A-1 in Appendix A).

Flow into the interior floodways is controlled by the USIBWC with adjustable gates that are closed during high storm events. This could cause floodwater to back up into agricultural drainages. A number of pumps are located on top of the levee to remove ponded water. A divider dike splits the base flows between the Main and North Floodways, with a partial routing of North Floodway water into Arroyo Colorado. Numerous irrigation canals also intersect the ACS via irrigation structures, but are not hydrologically connected to the Arroyo Colorado.

***No Action Alternative***

The current configuration of the ACS would be retained under the No Action Alternative, maintaining the current level of flood protection. The current level of flood protection may be insufficient to fully contain the Arroyo Colorado floodwaters and may pose risks to personal safety and property. Furthermore, the current condition fails to meet FEMA's criteria for a 100-year flood.

***Alternative 1: Levee Rehabilitation – 3 miles***

Under Alternative 1, the improvements would allow the USIBWC to certify this rehabilitated levee segment, thus meeting FEMA requirements. The improvements to the ACS would increase flood capacity and containment during storm events along the westernmost 3 miles; however, the structural deficiencies in the remaining 13 miles of the ACS to the east would not be improved.

***Alternative 2 (Preferred Alternative): Levee Rehabilitation – 16 miles***

The Preferred Alternative would increase flood capacity and containment during severe storm events along the entire length of the ACS. The improvements would allow the USIBWC to certify rehabilitated levee segments and meet FEMA requirements in segments where there are structural deficiencies in the levee system.

### 3.3.2 Water Quality

***Surface Water***

Sections 303(d) and 305(b) of the *Clean Water Act* (CWA) require all states to identify and characterize waters that do not meet, or are not expected to meet, applicable water quality standards. The TCEQ is the agency of the State of Texas responsible for ensuring that all waters of the state are in compliance with applicable surface water quality standards (30 Texas Administrative Code [TAC] 307). The TCEQ's Texas Integrated Report for CWA Sections 303(d) and 305(b) describes the status of Texas' natural waters based on historical data and identifies water bodies that do not meet standards set for their use on the 303(d) list, an inventory of impaired waters.

The classified segments that comprise the Arroyo Colorado (segments 2201 and 2202) consistently have failed to meet the water quality standards established by the State of Texas as reported in State of Texas Water Quality Inventory Reports (CWA Section 305(b) reports) and lists of impaired water bodies (CWA Section 303(d) lists). The ACS project area is within Segment 2202, the nontidal segment of the Arroyo Colorado located upstream of the Port of Harlingen.

Water quality issues in the nontidal segment of the Arroyo Colorado include high concentrations of fecal bacteria and nutrients such as nitrogen and phosphorus compounds (Arroyo Colorado Watershed Partnership 2007). Water quality and fish tissue analyses conducted between 1980 and 1998 identified several pollutants (i.e., chlordane, DDE, DDT, dieldrin, endrin, hexachlorobenzene, heptachlor, heptachlor epoxide, lindane, polychlorinated biphenyls, and toxaphene) in fish tissue at concentrations warranting a fish consumption advisory for the segments upstream from the Port of Harlingen (TCEQ 2010).

A pollutant reduction plan implemented by the TCEQ (2006) includes measures to reduce sources of pollution to the Arroyo Colorado. Sources identified by the TCEQ pollutant reduction plan included point and non-point discharges of wastewater from permitted treatment facilities, wastewater from on-site treatment systems typically generated by residences in rural areas, and

wastewater generated by residents of low-income, rural, and non-incorporated suburban communities (i.e., colonias). It is estimated that 20 to 40 percent of the pollution loading into the Arroyo Colorado is contributed by permitted wastewater facilities, while 6 to 26 percent is contributed by urban storm water. Untreated wastewater generated by colonias contributes approximately 4 percent of the pollution loading. Agricultural operations contribute 49 to 68 percent of nutrient loading and 68 percent of sediment loading (Arroyo Colorado Watershed Partnership 2007).

***Groundwater***

The major aquifer underlying the ACS is the Gulf Coast Aquifer. The aquifer consists of discontinuous beds of clay, silt, sand, and gravel that are hydrologically connected to form a large, leaky, artesian system. Water quality issues associated with the Gulf Coast Aquifer include land-surface subsidence, increased chloride content in the groundwater from the southwestern portion of the aquifer, and saltwater intrusion along the coast (TWDB 2006). An additional aquifer is located in the ACS area and is associated with the alluvial material of the Rio Grande river system.

A data search on the TWDB Water Information Integration and Dissemination (WIID) System was conducted on March 30, 2010 (TWDB 2010). The WIID System provides TWDB groundwater data and submitted water well driller reports. The area of interest included the entire length of the ACS project area corridor and approximately 100 feet on either side of the levee centerline. No water wells were identified within the area of interest.

***No Action Alternative***

Under the No Action Alternative, no levee construction activities would occur and the surface water quality in the Arroyo Colorado and groundwater quality in the aquifers would remain approximately unchanged from current conditions.

***Alternative 1: Levee Rehabilitation – 3 miles***

Short-term impacts to surface water of the Arroyo Colorado and groundwater of the alluvial aquifer may occur as a result of the activities associated with Alternative 1. Levee construction activities are expected to remove vegetation along the ACS, which could result in increased erosion potential and runoff during heavy precipitation events. Levee improvements to the ACS, however, would be conducted using best management practices to minimize sediment or construction debris from being transported into the Arroyo Colorado.

In areas where construction would occur near water bodies (e.g., impounded drainages), silt curtains or other erosion control devices such as temporary erosion blankets would be used to prevent sediment from reaching water bodies. Best management practices would be developed as part of the required SWPPP and in compliance with all federal, state, and local regulations, including Sections 402 and 404 of the CWA, rules established under the 30 TAC (Texas Water Code), and the Arroyo Colorado Watershed Protection Plan (Arroyo Colorado Watershed Partnership 2007).

Water quality impacts from the Alternative 1 construction activities would be localized and temporary, occurring only over a period of months at any one location. In accordance with the required construction storm water permit and any USACE 404 permit, specific measures would be implemented to minimize the impacts from construction activities. Therefore, impacts are expected to be short-term and negligible to surface water and groundwater under Alternative 1.

***Alternative 2 (Preferred Alternative): Levee Rehabilitation – 16 miles***

Short-term impacts on surface water of the Arroyo Colorado and groundwater of the alluvial aquifer may occur as a result of the activities associated with the Preferred Alternative. Levee construction activities are expected to remove vegetation along the ACS, which could result in increased erosion potential and runoff during heavy precipitation events. Levee improvements to the ACS, however, would be conducted using best management practices to minimize sediment or construction debris from being transported into the Arroyo Colorado.

In areas where construction would occur near water bodies (e.g., impounded drainages), silt curtains or other erosion control devices such as temporary erosion blankets would be used to prevent sediment from reaching water bodies. The best management practices would be developed as part of the required SWPPP and in compliance with all federal, state, and local regulations, including Sections 402 and 404 of the CWA, rules established under the 30 TAC, and the Arroyo Colorado Watershed Protection Plan (Arroyo Colorado Watershed Partnership 2007).

Construction activities under the Preferred Alternative would occur in a phased approach, thus limiting the areas of impact to relatively small portions of the ACS project area. Furthermore, water quality impacts from the Preferred Alternative construction activities would be localized and temporary, occurring only over a period of months at any one location. In accordance with the required construction storm water permit and any required USACE 404 permit, specific measures would be implemented to minimize the impacts from construction activities. Impacts are expected to be negligible to surface water and groundwater under the Preferred Action.

## 3.4 LAND USE

This section summarizes the existing land uses within the project area within Hidalgo and Cameron counties. Land use descriptions are limited to the project area along the ACS. Current land use potentially affected by the Proposed Action includes natural resources management areas, agricultural land, and residential areas. No urban, industrial, or recreational areas are located within the project area in Hidalgo County. No recreational areas are located within the project area in Cameron County; however, much of the land along the riverside of the south levee is used for commercial sand mining operations. An archery range also is located on a small woodland/thornscrub tract near levee mile 12 on the landside of the levee.

### 3.4.1 Natural Resources Management Areas

Natural resources management areas are established to represent habitats and wildlife populations typical of each ecological region of Texas and to encourage research on wildlife populations and habitat, including issues such as T&E species recovery and resource

management education, and to provide hiking, camping, bird watching, and other outdoor recreational opportunities. Two tracts of the LRGNWR occur within the project area. A narrow tract occurring in a corridor on both sides of the Willacy Irrigation Canal intersects the ACS approximately at levee mile 7. The second tract is located adjacent to the landside of the south levee at levee mile 13. The majority of the drainage ditches located parallel and adjacent to the landside of the south levee are associated with a de facto wildlife travel corridor (USFWS 2003).

***No Action Alternative***

No impacts to natural resource management areas are anticipated under the No Action Alternative, as the current levee configuration would be retained. Levee construction activities would not occur and no vegetation would be cleared.

***Alternative 1: Levee Rehabilitation – 3 miles***

Expansion of the ACS would occur entirely within the existing ROW. Construction activities would occur approximately 100 feet from the centerline on the riverside and to the riverside edge of the existing de facto wildlife travel corridor on the landside, as much as practicable. Alternative 1 would impact mostly herbaceous vegetation along levee slopes dominated by non-native species. There are no USFWS LRGNWR tracts within the westernmost 3 miles of the levee. However, levee expansion activities would impact approximately 3.7 acres of vegetation associated with the de facto wildlife travel corridor. Any construction within the de facto wildlife corridor would be coordinated with the USFWS and no trees within the de facto wildlife corridor would be cleared without prior approval of the USFWS.

***Alternative 2 (Preferred Alternative): Levee Rehabilitation – 16 miles***

Expansion of the ACS would occur entirely within the existing ROW. Construction activities would occur approximately 100 feet from the centerline on the riverside and to the riverside edge of the existing de facto wildlife travel corridor on the landside, as much as practicable. The Preferred Action would impact mostly herbaceous vegetation along levee slopes dominated by non-native species. Approximately 7.4 acres of vegetation within the USFWS LRGNWR tract near levee mile 13 and 8.3 acres of vegetation associated with the de facto wildlife travel corridor would be affected. Any construction within the de facto wildlife corridor would be coordinated with the USFWS and no trees within the de facto wildlife corridor would be cleared without prior approval of the USFWS. In addition, no construction activities would occur within the LRGNWR tract near levee mile 7. Construction activities along the LRGNWR tract near levee mile 13 would be limited to the riverside of the levee only. As with the de facto wildlife corridor, all construction activities within the LRGNWR tract would be coordinated with the USFWS.

USIBWC would compensate the loss of woodland/thornscrub habitat on a 3:1 acre basis and riparian habitat on a 1:1 acre basis. Land of equal value would be compensated under conservation easement, land acquisition, or monetary payment.

### 3.4.2 Agricultural Land and Rangeland

Cultivated agricultural land borders the majority of both sides of the south levee in Hidalgo County. In Cameron County, cultivated agricultural land borders the majority of the landside of the south levee, while the majority of the riverside of the south levee consists of a mixture of commercial land (i.e., commercial sand mining) and rangeland.

*The Farmland Protection Policy Act* (Public Law [P.L.] 97 – 98; Sec. 1539 – 1549; 7 U.S. Code 4201, et seq.) was enacted to minimize the unnecessary conversion of farmland to non-agricultural uses as a result of federal actions. The *Farmland Protection Policy Act* requires federal agencies to evaluate the adverse effects of their activities on prime and unique farmland as well as farmland of statewide and local importance. NRCS is responsible for protecting significant agricultural lands from irreversible conversions that result in the loss of an essential food or environmental resource. Prime farmland is characterized as land with the best physical and chemical characteristics for the production of food, feed, forage, fiber, and oilseed crops. Prime farmland is used either for food or fiber crops or is available for those crops, but is not urban, built-up land, or water areas. Unique farmland is land other than prime farmland that is used for production of specific high-value food and fiber crops. It has the special combination of soil quality, location, growing season and moisture supply needed to economically produce sustained high-quality, high yields, or specific crops when treated and managed according to acceptable farming methods.

In Hidalgo County within the project area, Laredo silty clay loam, Olmito silty clay, and Rio Grande silt loam are classified as prime farmland soil and Hidalgo fine sandy loam (1 to 3 percent slopes) is classified as prime farmland soils if irrigated (USDA – NRCS 2010). None of these prime or unique farmland soils are located within the project area in Hidalgo County. In Cameron County within the project area, Laredo silty clay loam (0 to 1 percent slopes), Olmito silty clay, and Rio Grande silt loam are classified as prime farmland soil, and Harlingen clay, Hidalgo fine sandy loam (1 to 3 percent slopes), and Mercedes clay (0 to 1 percent slopes) are classified as prime farmland soils if irrigated (USDA – NRCS 2010). Some areas within the project area in Cameron County contain prime farmland soils. The majority of these areas, however, are not used for crop production. One small area (approximately 2.5 acres) located within the project area and to the west of the La Feria Irrigation Canal (levee mile 9) is used for crop production and contains Laredo silty clay loam and Harlingen clay, prime farmland soils.

***No Action Alternative***

No impacts are anticipated to agricultural lands under the No Action Alternative, as the current levee configuration would be retained. Levee construction activities would not occur and no agricultural land would be removed. Agricultural land use in the area would continue as at the present time.

***Alternative 1: Levee Rehabilitation – 3 miles***

The ACS levee expansion footprint, including vehicle access areas, would occur within approximately 100 feet from the centerline on the riverside and to the riverside edge of the existing de facto wildlife travel corridor on the landside, as much as practicable. Under

Alternative 1, levee construction activities would impact approximately 12 acres of agricultural land. The areas of impact would occur as narrow strips adjacent to and paralleling the ACS, thus laterally minimizing impacts into adjacent lands. No rangeland or prime or unique farmlands are located within the project area in Hidalgo County.

***Alternative 2 (Preferred Alternative): Levee Rehabilitation – 16 miles***

The ACS levee expansion footprint, including vehicle access areas, would occur within approximately 100 feet from the centerline on the riverside and to the riverside edge of the existing de facto wildlife travel corridor on the landside, as much as practicable.. The Preferred Alternative would impact approximately 28 acres of agricultural land and 34 acres of rangeland. The areas of impact would occur as narrow strips adjacent to and paralleling the ACS, thus laterally minimizing impacts into adjacent lands. No prime or unique farmlands are located within the project area in Hidalgo County. Approximately 2.5 acres of prime farmland soil would be impacted in Cameron County. However, the impacts would be associated with temporary construction activities (e.g., vehicle use) and no irreversible conversion of farmland to nonagricultural uses would occur.

### 3.4.3 Residential Areas

The city limits of Progreso are located along approximately 0.5 mile of the western end of the landside of the ACS. Residential development within this area is limited and consists of a nearby subdivision. No residential developments are located within the existing ROW or within the levee expansion footprint. A few isolated and widely spaced residences are located nearby along the remaining length of the ACS (Figures A-1 through A-5 in Appendix A).

***No Action Alternative***

Residential development is limited to a relatively small portion of Progreso located on the south levee boundary at the westernmost end of the project area and a few isolated and widely spaced residences along the remaining length of the ACS project area. Under the No Action Alternative, the levee would continue not meeting FEMA criteria for a 100-year flood event; therefore, impacts to residences along the ACS would be expected.

***Alternative 1: Levee Rehabilitation – 3 miles***

Under Alternative 1, the improvements would allow the USIBWC to certify this rehabilitated levee segment, thus meeting FEMA requirements. The improvements to the ACS would increase flood capacity and containment during storm events along the westernmost 3 miles; therefore, beneficial impacts to the limited residential development in Progreso would be anticipated.

***Alternative 2 (Preferred Alternative): Levee Rehabilitation – 16 miles***

Beneficial impacts to residential developments located along the entire length of the ACS are anticipated. The Preferred Alternative would increase flood capacity and containment during severe storm events along the entire length of the ACS. The improvements would allow the

USIBWC to certify rehabilitated levee segments and meet FEMA requirements in segments where there are structural deficiencies in the levee system.

### 3.4.4 Commercial Properties

Commercial properties within the project area are limited and primarily consist of commercial sand mining operations that are located in Cameron County along the riverside of the south levee. Sand mining access roads are located adjacent to the riverside of the south levee along some segments of the ACS. An archery range also is located near levee mile 12 on the landside of the levee in Cameron County.

***No Action Alternative***

No impacts are anticipated, as the current levee configuration would be retained. Levee construction activities and levee expansion into commercial properties would not occur. The commercial land use in the area would continue as present time. Under the No Action Alternative, the levee would continue to not meet FEMA criteria for a 100-year flood event.

***Alternative 1: Levee Rehabilitation – 3 miles***

Under Alternative 1, levee construction activities would not impact commercial properties, as the 3 miles of proposed levee construction activities would occur in areas devoid of commercial properties.

***Alternative 2 (Preferred Alternative): Levee Rehabilitation – 16 miles***

The ACS levee expansion footprint, including vehicle access areas, would occur within approximately 100 feet from the centerline on the riverside and to the riverside edge of the existing de facto wildlife travel corridor on the landside, as much as practicable.. The Preferred Alternative would impact approximately 7 acres of commercial sand mining properties. The areas of impact would occur as narrow strips adjacent to and paralleling the ACS, thus laterally minimizing impacts into adjacent lands. The areas of ACS levee expansion would not be anticipated within areas where sand mining excavation occurs.

It is anticipated that the Preferred Alternative would have a negligible impact to production and operation of business. A temporary closure of business is not expected as a result of levee construction activities. Activities associated with levee construction may periodically obstruct sand mining access roads that are located adjacent to some segments of the riverside of the south levee. However, construction activities would be temporary and localized and a traffic control plan would be implemented to reduce the impact of construction-related traffic by using traffic control measures such as flaggers and traffic signs during business operation hours.

The Preferred Alternative would also have a negligible impact to the commercial property associated with the archery range. Construction activities are not anticipated to occur within areas used for archery activities. A temporary closure of business is not expected as a result of levee construction activities. Construction activities may periodically disrupt access to the archery range from the levee maintenance road. However, access to the archery range would not

be prevented; construction activities would be temporary and localized and a traffic control plan would be implemented to reduce the impact of construction-related traffic during occupied business operation hours. Therefore, impacts are anticipated to be negligible.

Post-construction routine maintenance activities are anticipated to be similar to present-day maintenance activities, therefore, no long-term impacts are anticipated to commercial properties from operation and management activities.

## 3.5 COMMUNITY RESOURCES

### 3.5.1 Socioeconomics

***Population***

The ACS rehabilitation project area is located within Cameron and Hidalgo counties. Municipalities within these counties that are near the south levee include Progreso, Mercedes, La Feria, Santa Maria, and Harlingen. The region of influence of this analysis is based on the location of the levee construction work being conducted in Hidalgo and Cameron counties.

Table 3-4 presents population data from 2000, as well as projected population data for 2010, 2020, and 2030, and the percent 30-year change for these areas. The total population of Cameron County is projected to increase by 75 percent from 2000 to 2030. The total population of Hidalgo County is projected to increase by 107 percent during the same period of time.

**Table 3-4: Population Growth in Cameron and Hidalgo Counties**

| Jurisdiction | 2000 | 2010 | 2020 | 2030 | Percent Change 2000-2030 |
|---|---|---|---|---|---|
| Cameron County | 335,227[1] | 415,136[1] | 499,618[2] | 586,944[2] | 75% |
| Hidalgo County | 569,463[1] | 744,258[1] | 948,488[2] | 1,177,243[2] | 107% |

[1] U.S. Census Bureau (2008)
[2] Texas Water Development Board (2010)

Median household incomes for Cameron and Hidalgo counties (reported in 1999 dollars) were $26,155 and $24,863 respectively, whereas the median family income was $27,853 and $26,009, respectively. Per capita income was $10,960 (reported in 1999 dollars) for Cameron County and $9,899 for Hidalgo County (U.S. Census Bureau 2008). Approximately 22 percent of all families in Cameron County and 46 percent in Hidalgo County were reported to be below the poverty level in the 2000 Census (U.S. Census Bureau 2008). Additional information on poverty data is provided in Section 3.5.2, Environmental Justice.

***Housing***

For the purposes of this EA, housing was evaluated based on the categories as defined by the U.S. Census Bureau. Multi-family housing units included structures that contain two or more

units. Single-family housing units included attached and detached 1-unit structures, mobile homes, and other housing units that do not fit in the previous categories such as boats and houseboats, recreational vehicles and campers, vans, and railroad cars.

Table 3-5 presents the estimated total housing units, single-family units, and multi-family units for Cameron and Hidalgo counties in 2000. According to the 2000 census (U.S. Census 2000), the housing stock was 119,654 in Cameron County and 192,658 in Hidalgo County. In Cameron County, approximately 20 percent of the housing stock in 2000 was composed of multi-family units, whereas single-family units accounted for the majority of the housing stock in the county at approximately 80 percent. The distribution of housing stock in 2000 was similar in Hidalgo County – approximately 12 percent of the housing stock was composed of multi-family units, whereas single-family units accounted for approximately 88 percent. As shown in Table 3-6 the total number of housing units in Cameron and Hidalgo counties increased 22 percent and 32 percent, respectively, from 2000 to 2008.

**Table 3-5: Estimated Total Housing Units, Single Family Units and Multi-Family Units for Cameron and Hidalgo Counties**

| Jurisdiction | Total Housing Units* | Single-Family Housing Units* | Percentage of Single-Family Housing Units | Multi-Family Housing Units[1] | Percentage of Multi-Family Housing Units |
|---|---|---|---|---|---|
| Cameron County | 119,654 | 95,629 | 79.9% | 24,025 | 20.1% |
| Hidalgo County | 192,658 | 169,620 | 88.0% | 23,038 | 12.0% |

* Based on 2000 values presented in U.S. Census Bureau (2000)

**Table 3-6: Estimated Change in Total Housing Units for Cameron and Hidalgo Counties from 2000 to 2008**

| Jurisdiction | Total Housing Units in 2000* | Total Housing Units in 2008* | Percent Change 2000-2010 |
|---|---|---|---|
| Cameron County | 119,654 | 145,625 | 22% |
| Hidalgo County | 192,658 | 253,366 | 32% |

* Based on values presented in U.S. Census Bureau (2000; 2008)

### *No Action Alternative*

Under the No Action Alternative, current maintenance operations along the ACS would continue to provide long-term benefits by maintaining revenue in wages and expenditures into the region's economy. USIBWC employees from several field offices contribute to the recurring maintenance activities. No additional business sales, income, or employment from construction would be created, no changes to housing units would occur, and no additional housing units

would be created as a result of current maintenance activities. The levee would continue to fail to meet FEMA 100-year flood criteria and may be incapable of holding back floodwaters in a severe flood.

***Alternative 1: Levee Rehabilitation – 3 miles***

Direct and indirect employment, business sales volume, and income are indicator criteria of socioeconomic impacts of Alternative 1.

Estimates of economic impacts of Alternative 1 at a county level in terms of employment, income, and sales volume, and reference annual values for Cameron and Hidalgo counties are presented in Tables 3-7 and 3-8, respectively. Unit costs for levee improvements are calculated estimates based on consultation with the USIBWC and data and methods available in previous USIBWC reports (USIBWC 2008). The average annual economic influx would be approximately $30.5 million and $9.1 million in terms of increased sales volume and income, respectively. In Cameron County, these data represent a 0.45 percent and 0.25 percent relative increase, respectively and in Hidalgo County, a 0.20 percent and 0.16 percent relative increase, respectively. A temporary influx of employment, business sales volume, and income would occur in Hidalgo and Cameron counties during construction activities. Construction activities associated with Alternative 1 would be performed by current USIBWC employees and local construction contractors. Under Alternative 1, 279 jobs would be created within the project area; this represents a 0.26 percent relative increase in Cameron County and 0.15 percent increase in Hidalgo County. The proposed improvements to the ACS are not expected to create major changes to the economic base or the tax base of the project area. Under the Alternative 1, maintenance operations along the ACS after levee construction would be similar to conditions prior to construction.

The proposed improvements would occur in the existing USIBWC levee ROW. No residential buildings or properties are located within the USIBWC levee ROW. The proposed improvements to the ACS would not adversely affect any residences in Hidalgo County. No commercial buildings or properties are located within ACS construction area in Hidalgo County; therefore, no adverse financial impacts to business from construction traffic would occur under Alternative 1. The improvement of the ACS would decrease the risk of a breach of the levee during severe flood events.

**Table 3-7: Economic Impacts of the Arroyo Colorado South Levee System in Cameron County**

| Evaluation Criteria | Unit Value Per Mile of Levee Improvement[1] | Annual Value for Cameron County | Total for Levee Improvements Under Alternative 1 (3 miles) | Change Relative to Cameron County | Total for Levee Improvements Under the Preferred Alternative (16 miles) | Change Relative to Cameron County |
|---|---|---|---|---|---|---|
| Local Expenditures | $3,000,000 | -- | $9,000,000 | -- | $48,000,000 | -- |
| Direct Employment | 57 | -- | 171 | -- | 912 | -- |
| Indirect Employment | 36 | -- | 108 | -- | 576 | -- |
| *Total Employment* | *93* | *109,107* | *279* | *0.26%* | *1,488* | *1.36%* |
| Direct Sales Volume | $3,822,195 | -- | $11,466,585 | -- | $61,155,120 | -- |
| Indirect Sales Volume | $6,344,844 | -- | $19,034,532 | -- | $101,517,504 | -- |
| *Total Sales Volume* | *$10,167,039* | *$6,737,683,453* | *$30,501,117* | *0.45%* | *$162,672,624* | *2.41%* |
| Direct Income | $1,664,442 | -- | $4,993,326 | -- | $26,631,072 | -- |
| Indirect Income | $1,357,398 | -- | $4,072,194 | -- | $21,718,368 | -- |
| *Total Income* | *$3,021,840* | *$3,674,087,920* | *$9,065,520* | *0.25%* | *$48,349,440* | *1.32%* |

1. Unit data for levee construction from USIBWC Rio Grande Flood Control Projects PEIS (USIBWC 2008; Table II-9)
2. Total of labor force (16 years and older) employed in 2000 (U.S. Census Bureau 2000)
3. Estimated Gross Sales for Cameron County in 2008 (Texas Comptroller of Public Accounts 2008)
4. Based on 2000 per capita income of $10,960 and a Cameron County population of 335,227.

**Table 3-8: Economic Impacts of the Arroyo Colorado South Levee System in Hidalgo County**

| Evaluation Criteria | Unit Value Per Mile of Levee Improvement[1] | Annual Value for Hidalgo County | Total for Levee Improvements Under Alternative 1 (3 miles) | Change Relative to Hidalgo County | Total for Levee Improvements Under the Preferred Alternative (16 miles) | Change Relative to Hidalgo County |
|---|---|---|---|---|---|---|
| Local Expenditures | $3,000,000 | -- | $9,000,000 | -- | $48,000,000 | -- |
| Direct Employment | 57 | -- | 171 | -- | 912 | -- |
| Indirect Employment | 36 | -- | 108 | -- | 576 | -- |
| *Total Employment* | *93* | *180,244* | *279* | *0.15%* | *1,488* | *0.83%* |
| Direct Sales Volume | $3,822,195 | -- | $11,466,585 | -- | $61,155,120 | -- |
| Indirect Sales Volume | $6,344,844 | -- | $19,034,532 | -- | $101,517,504 | -- |
| *Total Sales Volume* | *$10,167,039* | *$15,205,678,774* | *$30,501,117* | *0.20%* | *$162,672,624* | *1.07%* |
| Direct Income | $1,664,442 | -- | $4,993,326 | -- | $26,631,072 | -- |
| Indirect Income | $1,357,398 | -- | $4,072,194 | -- | $21,718,368 | -- |
| *Total Income* | *$3,021,840* | *$5,637,114,237* | *$9,065,520* | *0.16%* | *$48,349,440* | *0.86%* |

1. Unit data for levee construction from USIBWC Rio Grande Flood Control Projects PEIS (USIBWC 2008; Table II-9)
2. Total of labor force (16 years and older) employed in 2000 (U.S. Census Bureau 2000)
3. Estimated Gross Sales for Hidalgo County in 2008 (Texas Comptroller of Public Accounts 2008)
4. Based on 2000 per capita income of $9,899 and a Cameron County population of 569,463.

### *Alternative 2 (Preferred Alternative): Levee Rehabilitation – 16 miles*

Direct and indirect employment, business sales volume, and income are indicator criteria of socioeconomic impacts of the Preferred Alternative. Estimates of economic impacts of the Preferred Alternative at a county level in terms of employment, income, and sales volume, and reference annual values for Cameron and Hidalgo counties are presented in Tables 3-7 and 3-8, respectively. Unit costs for levee improvements are calculated estimates based on consultation with the USIBWC and data and methods available in previous USIBWC reports (USIBWC 2008). The average annual economic influx would be approximately $162.7 million and $48.3 million in terms of increased sales volume and income, respectively. In Cameron County, these data represent a 2.41 percent and 1.32 percent relative increase, respectively and in Hidalgo County, a 1.07 percent and 0.86 percent relative increase, respectively. A temporary influx of employment, business sales volume, and income would occur in Cameron and Hidalgo counties during construction. Construction activities associated with the Preferred Alternative would be

performed by current USIBWC employees and local construction contractors. Construction activities under the Preferred Alternative would occur in a phased approach, and thus would limit the number of personnel required. Under Alternative 1, 1,488 jobs would be created within the project area; this represents a 1.36 percent relative increase in Cameron County and 0.83 percent increase in Hidalgo County. The proposed improvements to the ACS are not expected to create major changes to the economic base or the tax base of the project area. Under the Preferred Alternative, maintenance operations along the ACS after levee construction would be similar to conditions prior to construction.

The proposed improvements would occur in the existing USIBWC levee ROW. No residential buildings or properties are located within the USIBWC levee ROW. The proposed improvements to the ACS would not negatively affect any residences in Hidalgo or Cameron counties. Commercial sand mining properties are located along the riverside of the ACS in Cameron County, and it is anticipated that periodic, temporary obstructions would occur from construction traffic in segments with adjacent sand mining access roads. However, a traffic control plan would be implemented to reduce the impact of construction-related traffic by using traffic control measures such as flaggers and traffic signs. An archery range also is located in Cameron County near levee mile 12 and on the landside of the levee. It is anticipated that periodic, temporary obstructions would occur from construction traffic. The improvement of the ACS would decrease the risk of a breach of the levee during severe flood events.

### 3.5.2 Environmental Justice

On February 11, 1994, the President issued Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations", providing that "*each Federal agency make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health and environmental effects of its programs, policies, and activities on minority populations and low-income populations.*" In an accompanying memorandum to heads of departments, the President specifically recognized the importance of procedures under NEPA for identifying and addressing environmental justice concerns, stating that "*each Federal agency shall analyze the environmental effects, including human health, economic and social effects, of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by* [NEPA]."

According to the CEQ, minority groups include individuals who are members of American Indian or Alaskan Native, Asian or Pacific Islander, Black (not of Hispanic origin), and Hispanic population groups. A minority population is a group of individuals living in close proximity to one another where either: (a) a minority group of the population within the affected area exceeds 50% of that population, (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population, or (c) there is more than one minority group present and the minority percentage, as calculated by aggregating all minority persons, meets one of the first two thresholds.

As defined by the CEQ, low-income groups include individuals who earn an annual family income below the statistical poverty thresholds provided by the U.S. Census Bureau's Current

Population Reports, Series P-60. A low-income population includes a group of individuals whose median family income for the year is below the poverty threshold identified by the U.S. Census Bureau (2000).

In order to identify minority and low-income populations in the project area potentially affected by the three alternatives, individual county census tracts were chosen as arbitrary geographic boundaries of a group of individuals that experience common conditions of environmental exposure as to not artificially dilute or inflate the affected minority or low-income populations. All of the data presented below are derived from the U.S. Census Bureau (2000) Census Report. Table 3-9 presents a detailed comparison of community population data by the Proposed Action.

**Table 3-9: Percentage of Minority Populations and Poverty Rates in the Project Area**

| **Ethnic Composition*** | **Cameron County (Tracts 119.03 and 120)** | **Percent** | **Hidalgo County (Tract 228)** | **Percent** |
|---|---|---|---|---|
| White | 3,255 | 30.2% | 307 | 4.2% |
| Hispanic or Latino (of any race) | 7,425 | 68.9% | 6,938 | 95.6% |
| Black | 39 | 0.4% | 5 | 0.1% |
| Asian | 37 | 0.3% | 4 | 0.1% |
| American Indian | 21 | 0.2% | 1 | <0.1% |
| *Total Population* | *10,777* | *100%* | *7,255* | *100%* |
| *Total Minority* | *7,522* | *69.7%* | *6,948* | *95.8%* |
| **Poverty Levels*** | **Cameron County (Tracts 119.03 and 120)** | **Percent** | **Hidalgo County (Tract 228)** | **Percent** |
| Individuals Below Poverty Levels | 2,398 | 22.3% | 3,306 | 45.6% |

* Based on 2000 values and percentages presented in the U.S. Census Bureau (2000)

### *No Action Alternative*

The affected area is the footprint of land where potential beneficial or adverse impacts could result from a planned activity. For this proposed project, the affected areas are those that could be affected by flood waters of the Arroyo Colorado. The No Action Alternative would not increase flood capacity during flood events, and thus would not result in any increases in flood control and associated reduction in health hazards to the immediate communities. Environmental justice issues can arise as a result of the uncontrolled flood waters that may cause damage to life and property within minority and low-income populations. No adverse impacts to biological resources, air quality, noise, and cultural resources would occur under the No Action Alternative.

***Alternative 1: Levee Rehabilitation – 3 miles***

Data indicate that Hidalgo County has a high minority population (approximately 69 percent) and 46 percent of the family incomes are below the poverty level; however, construction activities would not occur in residential or workplace areas associated with these populations. A small, positive, temporary economic contribution to the local community would occur as a result of the Alternative 1. The improvement of the westernmost 3 miles of the ACS also would provide a beneficial impact to the communities within this area because it would provide increased protection against flooding. For the remaining length of the ACS, environmental justice issues can arise as a result of the uncontrolled flood waters that may cause damage to life and property within minority and low-income populations.

***Alternative 2 (Preferred Alternative): Levee Rehabilitation – 16 miles***

Data indicate that Cameron and Hidalgo counties have high minority populations (approximately 96 percent and 69 percent, respectively) and family incomes below the poverty level (22 percent and 46 percent, respectively); however, construction activities would not occur in residential or workplace areas associated with these populations. A small, positive, temporary economic contribution to the local community would occur as a result of the Proposed Action. The improvement of areas with structural deficiencies along 16 miles of the ACS also would provide a beneficial impact to communities within these areas because it would provide increased protection against flooding. No adverse impacts to disproportionately high minority and low-income populations are expected from improvements to the ACS levee.

### 3.5.3 Transportation

The levee system for the ACS extends approximately 16 miles from Farm to Market Road 1015 near Progreso, Hidalgo County, Texas to the intersection of Parker Road and Abd Road near Harlingen, Cameron County, Texas. The levee system traverses the southern portions of Cameron and Hidalgo counties. Numerous paved and unpaved local, state, and interstate roadways are located within and near the ACS area. Many of these roadways cross the Arroyo Colorado. The transportation system for the two-county area is served by a network of highways that include United States Highways 83 and 281.

***No Action Alternative***

Under the No Action Alternative, the current levee system and infrastructure would be retained. No changes to transportation systems would occur. Therefore, no impacts would be anticipated.

***Alternative 1: Levee Rehabilitation – 3 miles***

Proposed improvements to the ACS under Alternative 1 would have moderate impacts on local transportation. Heavy construction equipment (dump trucks, front-end loaders, graders) likely would be driven to the construction site from local areas using local highways and surface streets. During levee construction, a temporary increase in use of the access roads would occur during placement of equipment in the staging areas. Potential levee access road locations for Alternative 1 include Farm to Market 1015 and Farm to Market 491.

Subsequent construction activities also would temporarily increase local transportation, as fill material would be imported from sources outside the levee system. Levee construction activities, including staging activities, would occur within the existing ROW. Transportation of construction equipment and the use of personal vehicles would occur within the levee ROW and along the levee road system within the floodway. Following completion of construction, the levee roads would continue providing access for USIBWC maintenance activities and U.S. Border Patrol (USBP) surveillance activities.

***Alternative 2 (Preferred Alternative – 16 miles)***

Proposed improvements to the ACS would have moderate impacts on local transportation. Heavy construction equipment (dump trucks, front-end loaders, graders) likely would be driven to the construction site from local areas using local highways and surface streets. During levee construction, a temporary increase in use of the access roads would occur during placement of equipment in the staging areas. Potential access roads for the Preferred Alternative include Farm to Market 1015, Farm to Market 491, County Road 2556, County Road 506, Bass Boulevard, Dilworth/Turner Road, and Abd Road.

Subsequent construction activities also would temporarily increase local transportation, as fill material would be imported from sources outside the levee system. Levee construction activities, including staging activities, would occur within the existing ROW. Transportation of construction equipment and the use of personal vehicles would occur mainly within the levee ROW and along the levee road system within the floodway. Following completion of construction, the levee roads would continue providing access for USIBWC maintenance activities and USBP surveillance activities.

Commercial sand mining properties are located along the riverside of the ACS in Cameron County. It is anticipated that periodic, temporary impacts would occur from construction traffic in segments with adjacent sand mining access roads. A traffic control plan would be implemented to reduce the impact of construction-related traffic by using traffic control measures such as flaggers and traffic signs. Temporary impacts also would occur from construction traffic in the vicinity of the archery range. Access would not be prevented to commercial properties during construction activities.

## 3.6 ENVIRONMENTAL HEALTH

### 3.6.1 Air Quality

The *Clean Air Act* (CAA), as amended in 1977 and 1990, provides the basis for regulating air pollution to the atmosphere. The CAA, Title 42, Section 7407 of the U.S. Code states that Air Quality Control Regions (AQCR) shall be designated in interstate and major intrastate areas as deemed necessary or appropriate by federal administrator for attainment and maintenance of the National Ambient Air Quality Standards (NAAQS). The USEPA classifies air quality within AQCR according to whether the concentrations of criteria air pollutants in the atmosphere exceed primary or secondary NAAQS. Primary standards define levels of air quality necessary, with an adequate margin of safety, to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards define levels of

air quality necessary to protect public welfare (e.g., decreased visibility; damage to animals, crops, vegetation, wildlife, and buildings) from any known or anticipated adverse effects of a pollutant.

Based on the NAAQS, each state is divided into three types of areas for each of the criteria pollutants: (a) those that are in compliance with the NAAQS (attainment), (b) those that do not meet the ambient air quality standards (nonattainment), and (c) those areas where a determination of attainment/nonattainment cannot be made due to a lack of monitoring data (unclassifiable – treated as attainment until proven otherwise).

NAAQS currently are established for six criteria air pollutants, including carbon monoxide, lead, nitrogen dioxide, particulate matter with an aerodynamic diameter less than or equal to microns, particulate matter with an aerodynamic diameter less than or equal to 2.5 microns, ozone, and sulfur dioxide.

An attainment designation indicates that air quality within an area is as good as or better than the NAAQS. The ACS project area is located within Hidalgo and Cameron counties, which are located within the Brownsville – Laredo AQCR. This region is designated as AQCR 213 by the USEPA and includes Cameron, Hidalgo, Jim Hogg, Starr, Webb, Willacy, and Zapata Counties. As of March 2010, AQCR 213 was designated in attainment status for all criteria pollutants (USEPA 2010a).

Table 3-10 presents the combined area emission inventory for Hidalgo and Cameron counties for the year 2002 and impacts associated with Alternative 1 and the Preferred Alternative (discussed below). The combined area emission inventory is based on the latest available data from the USEPA National Emissions Inventory as of April 2010 (USEPA 2010b).

***No Action Alternative***

No impacts are anticipated under the No Action Alternative, as the current ACS levee configuration would be retained. No changes would occur to the routine maintenance of the south levee.

***Alternative 1: Levee Rehabilitation – 3 miles***

Air quality impacts from construction activities would be localized and temporary, occurring only over a period of months at any one location. Negligible impacts are expected from construction activities. Post-construction routine levee maintenance activities are expected to be similar to current maintenance activities; therefore, no impacts are anticipated from operation and maintenance activities. During project construction activities, measures such as wetting the soil, limiting unnecessary idling of construction vehicles, maintaining vehicles in proper working condition, and shutting down construction machines that are not in use would be employed to minimize additional air quality impacts from construction activities. Table 3-10 presents the additional estimated criteria pollutants associated with Alternative 1, as well as the percent increase above the existing Hidalgo County and Cameron County combined emission inventory. Estimates were calculated for 3 miles of levee construction activities based on methodology and data available in previous USIBWC reports (USIBWC 2007). Estimated emissions represent

less than 0.038 percent of the Hidalgo and Cameron counties annual emissions inventory for each of the five criteria pollutants.

**Table 3-10: Air Emissions for Improvements to the Arroyo Colorado South Levee System**

| Parameter | Emissions | | | | |
|---|---|---|---|---|---|
| | **Carbon Monoxide** | **Nitrogen Oxides** | **Particulate Matter ($PM_{10}$)** | **Sulfur Dioxide** | **Volatile Organic Compounds** |
| Unit emissions per mile of levee height increase (tons per year)[1] | 2.11 | 5.05 | 5.61 | 0.55 | 0.4 |
| Hidalgo and Cameron Counties Emissions Inventory (tons per year)[2,3] | 198,643 | 39,417 | 91,959 | 5,092.91 | 38,718 |
| **Alternative 1: Levee Rehabilitation – 3 miles** | | | | | |
| Estimated Emissions Produced from Arroyo Colorado South Levee System Project (tons per year) | 6.33 | 15.15 | 16.83 | 1.65 | 1.2 |
| Emissions as a Percent of Hidalgo and Cameron Counties' Emissions (percent)[3] | 0.003 | 0.038 | 0.018 | 0.032 | 0.003 |
| **Alternative 2: Levee Rehabilitation – 16 miles (Preferred Alternative)** | | | | | |
| Estimated Emissions Produced from Arroyo Colorado South Levee System Project (tons per year) | 33.76 | 80.8 | 89.76 | 8.8 | 6.4 |
| Emissions as a Percent of Hidalgo and Cameron Counties' Emissions (percent) | 0.017 | 0.205 | 0.098 | 0.173 | 0.017 |

1. Unit data for levee construction from the USIBWC Main and North Floodway EA (USIBWC 2007: Table 4.8).
2. USEPA 2010b, the most recent available data as of April 2010.
3. Due to the proximity of Alternative 1 construction activities to Cameron County, emissions data for both Hidalgo and Cameron counties were included to calculated percentages.

### *Alternative 2 (Preferred Alternative): Levee Rehabilitation – 16 miles*

Construction activities under the Preferred Alternative would occur in a phased approach, thus limiting the areas of impact to relatively small portions of the ACS project area at any one time. Air quality impacts from construction activities would be localized and temporary, occurring only over a period of months at any one location. Negligible impacts are expected from construction activities. Post-construction routine levee maintenance activities are expected to be similar to current maintenance activities; therefore, no impacts are anticipated from operation and maintenance activities. During project construction activities, measures such as wetting the soil, limiting unnecessary idling of construction vehicles, maintaining vehicles in proper working condition, and shutting down construction machines that are not in use would be employed to

minimize additional air quality impacts from construction activities. Under the Preferred Alternative, criteria pollutants would increase slightly within Hidalgo and Cameron counties. Table 3-10 presents the additional estimated criteria pollutants associated with the Preferred Alternative, as well as the percent increase above the existing Hidalgo County and Cameron County combined emission inventory. Estimates were calculated for 16 miles of levee construction activities based on methodology and data available in previous USIBWC reports (USIBWC 2007). Estimated emissions represent less than 0.2 percent of the Hidalgo and Cameron counties annual emissions inventory for each of the five criteria pollutants.

### 3.6.2 Noise

Noise is defined as sound that is undesirable. Although sound levels are subjective, federal and local governments have established noise guidelines and regulations for the purpose of protecting citizens from potential hearing damage and from various other adverse physiological, psychological, and social effects associated with noise. The Federal Interagency Committee on Urban Noise developed land use compatibility guidelines for noise in terms of day-night average sound level (DNL) metered in decibels (dB) (USDOT 1980). In general, residential units and other noise-sensitive land uses are "clearly unacceptable" in areas where the noise exposure exceeds DNL 75 dB; "normally unacceptable" in regions exposed to noise between DNL 65 and 75 dB; and "normally acceptable" in areas exposed to noise where the DNL is 65 dB or less.

The primary sources of noise within the project area are traffic from local roads and highways, farm equipment, and periodic vegetation management and maintenance activities. Several residences are located near the ACS. No other sensitive noise receptors such as schools, churches, or medical facilities are located in the project area.

***No Action Alternative***

Under the No Action Alternative, the current levee configuration would be retained, thus no noise impacts are anticipated. No additional sources of noise, outside of routine levee maintenance activities, are expected.

***Alternative 1: Levee Rehabilitation – 3 miles***

Under Alternative 1, levee construction activities temporarily would increase ambient noise levels due to additional construction vehicle traffic. Trucks would bring additional fill material to the site for fill activities associated with the levee improvement. For the purposes of this EA, it is estimated that the shortest distance between an equipment noise source and a receptor (i.e., person[s]) in a rural area would be 100 feet. Given the rural nature of the area in Hidalgo County, it is unlikely a person other than a worker would be within 100 feet of the site boundary during construction activities; however, if a person were within this distance, the person could be exposed to noise as high as 74 to 83 dB.

It is anticipated that construction activities would occur between 7:30 a.m. and 5:00 p.m. for 5 days per week during construction activities. However, individuals would not be exposed during the entire noise-producing period because construction activities would be temporary and localized. Under these conditions, persons would not be exposed to long-term and regular noise

above 75 dB. As stated above, 75 dB during the noise event indicates a good probability for frequent speech disruption, producing ratings of "barely acceptable" for intelligibility of spoken material. Therefore, although nearby persons are not expected to experience loss of hearing, they may experience frequent speech disruption. During project construction activities, measures such as limiting unnecessary idling of construction vehicles, maintaining vehicles in proper working condition, and shutting down construction machines that are not in use would be employed to minimize additional noise impacts from construction activities.

***Alternative 2 (Preferred Alternative): Levee Rehabilitation – 16 miles***

Under the Preferred Alternative, levee construction activities would increase ambient noise levels from additional construction vehicle traffic. Trucks would bring additional fill material to the site for fill activities associated with the levee improvement project. For the purposes of this EA, it is estimated that the shortest distance between an equipment noise source and a receptor (i.e., person[s]) in a rural area would be 100 feet. In Hidalgo and Cameron counties, given the rural nature of the area, it is unlikely a person other than a worker would be within 100 feet of the site boundary during activities. However, if a person were within this distance, the person could be exposed to noise as high as 74 to 83 dB.

It is anticipated that construction activities would occur between 7:30 a.m. and 5:00 p.m. for 5 days per week during construction activities; however, individuals would not be exposed during the entire noise-producing period because construction activities would be temporary and localized. Under these conditions, persons would not be exposed to long-term and regular noise above 75 dB. As state above, 75 dB during the noise event indicates a good probability for frequent speech disruption, producing ratings of "barely acceptable" for intelligibility of spoken material. Therefore, although nearby persons are not expected to experience loss of hearing, they may experience frequent speech disruption. During project construction activities, measures such as limiting unnecessary idling of construction vehicles, maintaining vehicles in proper working condition, and shutting down construction machines that are not in use would be employed to minimize additional noise impacts from construction activities.

Construction activities under the Preferred Alternative would occur in a phased approach, thus limiting the areas of impact to relatively small portions of the ACS project area. Negligible impacts are expected from construction activities.

### 3.6.3 Hazardous Materials

Hazardous materials are those substances defined by the *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA), as amended by the *Superfund Amendments and Reauthorization Act* (SARA), and the *Toxic Substances Control Act* (TSCA). The *Solid Waste Disposal Act* as amended by the *Resource Conservation and Recovery Act* (RCRA), which was further amended by the Hazardous and Solid Waste Amendments, defines hazardous wastes. In general, both hazardous materials and hazardous wastes include substances that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, may present substantial danger to public health or welfare or to the environment when released or otherwise improperly managed.

Waste disposal activities within or near the project area were reviewed to identify areas where industrial processes occurred, solid and hazardous wastes were stored, disposed, or released, and where hazardous materials or petroleum or its derivatives were stored or used. A data search on the USEPA Enviromapper for Envirofacts website was conducted on March 30, 2010 (USEPA 2010c). The Enviromapper website combines interactive maps and aerial photography to display facility-based environmental information as filed with state agencies and reported to the USEPA. The facility types queried for the ACS project area included Superfund sites, toxic release sites, water dischargers, hazardous waste sites, and multi-activity sites. The Enviromapper area of interest included the entire length of the ACS project area and up to 1 mile on either side from the centerline of the levee. The results of the environmental database report indicated that one facility, the Progreso Wastewater Treatment Plant, is located within the project area between levee miles 1 and 2. This facility consists of water treatment ponds that are located on the landside of the levee approximately 115 feet from the levee centerline, which is considered outside of the levee expansion area.

***All Alternatives***

No impacts from waste storage and disposal sites are anticipated because no Superfund sites, toxic release sites, water dischargers, hazardous waste facilities or sites, or multi-activity sites are located within the levee expansion area. The Progreso Wastewater Treatment Plant is located outside of the levee expansion area, approximately 115 feet from the centerline of the levee (landside).

## 3.7 CUMULATIVE IMPACTS

The CEQ defines cumulative impacts as impacts on the environment that result from the incremental impacts of the proposed action when added to other past, present, and reasonably foreseeable future actions, both federal and nonfederal (40 CFR 1508.7). Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time. Two criteria were used to determine whether an action should be considered under cumulative effects analysis:

- It must be reasonably foreseeable. It must have a legislative mandate, agreement, or formal proposal that specifies the scope of the action such that its content and intensity can be measurably calculated without speculation.

- Impacts must occur within the same time and geographic space such that a measurable, combined impact actually exists.

A review of current and proposed local, state, and federal activities in and near the project area identified the *Final Environmental Assessment, Improvements to the North and Main Floodways Levee Systems* (USIBWC 2007), the *Environmental Assessment, Improvements to the Arroyo Colorado North Levee Project* (USIBWC 2009), *A Watershed Protection Plan for the Arroyo Colorado: Phase I* (Arroyo Colorado Watershed Partnership 2007) and a road improvement project along Farm to Market Road 1015 (Texas Department of Transportation [TxDOT] 2010).

For the purposes of this EA, the cumulative impact assessment focused on actions located within a one mile radius of the project area due to the narrow construction corridor.

Based on the latest quarterly report by the Arroyo Colorado Watershed Partnership (2010), no construction or restoration projects are currently planned within the project area. As there are no Arroyo Colorado Watershed Partnership projects identified to occur within one mile of the project area, no analysis of cumulative impacts is warranted.

TxDOT is proposing to resurface approximately 1.8 miles of Farm to Market Road 1015 from approximately 300 feet south of the levee to U.S. Highway 281. However, the environmental assessment has not been completed for this project; therefore, a cumulative impacts analysis cannot be completed without speculation.

The North and Main Floodway Levee Improvements Project consists of raising the levees along 76 miles of the Main and North Floodways in Hidalgo, Cameron, and Willacy Counties. Approximately 3 miles of levee improvements are located within one mile of the project area and construction is anticipated to occur during the same time as the Proposed Action.

The Arroyo Colorado North Levee Improvements Project involves raising approximately 11 miles of levee from Farm to Market Road 1015 to the Willacy Canal and from the Willacy Canal to White Ranch Road on the north side of the Arroyo Colorado Floodway (USIBWC 2009). The entire 11 miles of levee improvements are located within one mile of the project area and construction is anticipated to be ongoing during the same time as the Proposed Action.

Expected cumulative impacts from the North and Main Floodway Levee Improvements Project, the Arroyo Colorado North Levee Improvements Project, and the Proposed Action are detailed in the sections below. Data used in this analysis was derived from the *Final Environmental Assessment, Improvements to the North and Main Floodways Levee Systems* (USIBWC 2007) and the *Environmental Assessment, Improvements to the Arroyo Colorado North Levee Project* (USIBWC 2009).

### 3.7.1 Biological Resources

The combined vegetation impact from all three projects would be approximately 470 acres composed primarily of low quality, herbaceous non-native grasslands along levee slopes. This accounts for approximately 11.6 percent of the 4,069 acres of land within the area. No sensitive woodlands would be removed for any of the three projects. Less than 1-acre of non-jurisdictional wetlands would be impacted by all three projects. No suitable habitat for threatened and endangered species would be impacted by any of the projects. Therefore, the cumulative impacts are not likely to adversely affect any threatened or endangered species. Cumulative adverse impacts to other biological resources would be temporary and minor.

### 3.7.2 Cultural Resources

None of the three projects would affect any known archeological resources within the area. Modifications to the levees by the Arroyo Colorado North Levee Project and the Proposed Action may adversely affect architectural resources within the ACF. However, close

coordination with the THC would ensure appropriate preservation measures are implemented. No known Native American resources would be affected by any of the projects and previous consultations with the Comanche Nation and the Kiowa Tribe of Oklahoma did not reveal any Native American resource concerns.

### 3.7.3 Water Resources

All three projects are subject to state permitting by the TCEQ, ensuring that projects do not degrade water quality from construction activities. Since all three projects are or have been subject to the state permitting process, there would be no major cumulative surface water impacts. All three projects would improve local flood protection by meeting the FEMA flood criteria.

### 3.7.4 Land Use

No agricultural, residential, commercial, or natural resource areas would be impacted by the North and Main Floodway Levee and Arroyo Colorado North Levee Projects. Therefore, there would no cumulative impacts from the Proposed Action.

### 3.7.5 Community Resources

The three projects would account for approximately $225,020,319 in total sales and 2,058 jobs created in Hidalgo County. This represents a 1.48 percent increase in annual sales and a 1.14 percent increase in employment for the county. The three projects would account for approximately $206,516,289 in total sales and 1,888 jobs created in Cameron County. This represents a 3.07 percent increase in annual sales and a 1.88 percent increase in employment for the county. No homes or businesses would be impacted by the North and Main Floodway Levee and Arroyo Colorado North Levee Projects. Cumulative impacts to the community from the three projects would be temporary and minor.

### 3.7.6 Environmental Health

The combined air emissions from the three projects are presented in Table 3-11 below.

Cumulative impacts to air quality from the three projects would be negligible. Noise impacts within the area are primarily caused by traffic and construction equipment. Noise levels for all three projects are not anticipated to exceed 83dB at any one location. The closest point between the North and Main Floodway Levee and Arroyo Colorado North Levee Projects to the project area is approximately 250 feet. However, the majority of the construction locations are 800 to 3,000 feet from the project area. Since traffic noise levels decrease approximately 3 dBA per 100 feet (Hanson et al. 2006), the increased noise levels from the North and Main Floodway Levee and Arroyo Colorado North Levee Projects would have dissipated before reaching the project area. Therefore, there would no cumulative noise impacts. There are no impacts from waste storage and disposal sites to any of the three projects.

**Table 3-11: Air Emissions for Improvements to the Main and North Floodway Levee, Arroyo Colorado North Levee and Arroyo Colorado South Levee Systems**

| Parameter | Emissions | | | | |
|---|---|---|---|---|---|
| | **Carbon Monoxide** | **Nitrogen Oxides** | **Particulate Matter ($PM_{10}$)** | **Sulfur Dioxide** | **Volatile Organic Compounds** |
| Hidalgo and Cameron Counties Emissions Inventory (tons per year)[1] | 198,643 | 39,417 | 91,959 | 5,092.91 | 38,718 |
| Estimated Emissions Produced from All Three Projects (tons per year) | 156.14 | 373.70 | 415.14 | 40.70 | 29.60 |
| Emissions as a Percent of Hidalgo and Cameron Counties' Emissions (percent) | 0.08 | 0.95 | 0.45 | 0.80 | 0.08 |

1. USEPA 2010b, the most recent available data as of April 2010.

# SECTION 4:

# BEST MANAGEMENT PRACTICES

This section describes the environmental commitments to be implemented as part of the evaluated alternatives for improved flood control of the ACS system. Best management practices represent specific actions to minimize the potential for impacts to natural and cultural resources. Best management practices are organized within the engineering, natural resources, and cultural resources categories.

## 4.1 ENGINEERING MEASURES

Levee expansion alignment would be optimized, to the extent possible, to avoid impacts to wooded vegetation, wetlands, and other natural resources. Levee footprint expansion is not anticipated along areas with a potential to contain cultural resources. The following best management practices are provided to avoid construction impacts on resources near levee construction areas:

- A SWPPP would be developed during project design to minimize impacts to receiving water, as specified by USEPA regulations for construction projects. The SWPPP would include construction areas along the levee system, as well as equipment staging areas. The contractor would be required to develop the SWPPP and obtain all permits and clearances necessary prior to construction.

- The contractor would be required to obtain all USACE permits and clearances necessary for construction in areas designated as waters of the U.S (Appendix D) prior to construction. All permit conditions would be followed in order to minimize impacts to waters of the U.S.
- During project construction, methods such as wetting the soil would be employed to prevent erosion from unvegetated slopes and/or corridors and to minimize additional air quality impacts from construction activities. Limiting unnecessary idling of construction vehicles, maintaining vehicles in proper working condition, and shutting down construction machines that are not in use would be employed to minimize additional air quality impacts from construction activities.
- During construction, in areas where construction would occur near water bodies (e.g., impounded drainage canals), silt curtains or other erosion control devices such as temporary erosion blankets would be used to prevent sediment from reaching water bodies.
- During project construction, existing access points to the levee road would remain in service; because no significant modifications would be made to the levee 3:1 slope ratio, lateral access to the levee road would continue as currently available.

## 4.2 NATURAL RESOURCES

Some vegetation, including old-field, woodland/thornscrub, riparian, rangeland, and agricultural communities would be removed during levee expansion. These communities are expected to rapidly re-establish upon project completion. For additional protection of sensitive vegetation and wildlife, the following best management practices would be utilized:

- Any construction activities that are to occur along the USFWS LRGNWR tracts and the de facto wildlife travel corridor would be coordinated with the USFWS and no trees within the de facto wildlife corridor would be cleared without prior approval of the USFWS. Coordination measures may include, but are not limited to, removal of vegetation during nonbreeding seasons, selective vegetation removal, revegetation with native trees or shrubs, and avoidance.

- USIBWC would compensate the loss of woodland/thornscrub habitat on a 3:1 acre basis and riparian habitat on a 1:1 acre basis. Land of equal value would be compensated under conservation easement, land acquisition, or monetary payment.

- Revegetation with native herbaceous species would be implemented after construction is complete along the expanded levee and any required construction corridor. Rapid re-establishment of vegetation would allow native species to become established, and would provide additional erosion control. Native vegetation species to be used in reclamation would be determined through coordination with the USFWS and the TWPD.

- Bird species in the area that are protected under the MBTA may nest in areas containing trees or other suitable habitat. Construction activities would be scheduled to occur outside the March through August migratory bird nesting season, when possible. If construction activities must occur during the nesting season of birds protected under the MBTA, then the areas proposed for disturbances would be surveyed for nesting birds prior to construction to avoid inadvertent destruction of nests and eggs.

- Prior to and during construction activities, the contractor that would be performing the levee work would provide a qualified environmental monitor to survey T&E species to prevent direct or indirect take of a listed species. The environmental monitor also would survey for birds protected under the MBTA to prevent destruction of nests or eggs during construction activities.

## 4.3 CULTURAL RESOURCES

In the event that any human remains or burial furniture are encountered during construction, all work will cease and law enforcement and the THC will be notified.

# SECTION 5:

# ENVIRONMENTAL COMPLIANCE AND COORDINATION

## 5.1 CONSULTATION

The Draft EA was sent for a 30-day public review period to representatives of the agencies or organizations listed in Table 5-1.

**Table 5-1: EA Mailing List of Agencies and Organizations**

| Agencies and Organizations | |
|---|---|
| U.S. Fish and Wildlife Service, Ecological Services | Comanche Nation, Chairman |
| U.S. Army Corps of Engineers, Galveston District | Kiowa Tribe of Oklahoma, Chairman |
| United States Border Patrol, Rio Grande Valley Sector | Cameron County Drainage District #5 |
| Texas Parks and Wildlife Department, Wildlife Habitat Assessment Program | Hidalgo County Drainage District #1 |
| Texas Parks and Wildlife Department, State Parks Division | Santa Maria Irrigation District |
| Texas Historical Commission, Archeological Division | Hidalgo and Cameron County Irrigation District #9 |
| Texas Historical Commission, Historic Division | La Feria Irrigation District |
| Texas Commission on Environmental Quality Section 401 Coordination | Harlingen Irrigation District |
| Port of Harlingen Authority, Port Director | Hidalgo County Irrigation District #5 |
| Adams Garden Irrigation District | Arroyo Colorado Watershed Partnership |

## 5.2 DRAFT EA COMMENTS AND RESPONSES

Comments on the Draft EA were received from the following agencies:

- USEPA concurred with the Finding of No Significant Impact and had no additional comments.

- TCEQ concurred with the Finding of No Significant Impact and had no additional comments.

- USACE determined that seven (7) locations within the project area would be subject to USACE jurisdiction and require a permit prior to construction.

- THC determined that the proposed project would have no adverse affect on historic resources.

- USFWS raised concerns regarding vegetation removal within the LRGVNWR tracts and the de facto wildlife corridor along with impacts to the non-jurisdictional wetland. Based on these comments, USIBWC has revised the Final EA to limit construction activities, to the maximum extent practicable, within the de facto wildlife travel corridor. Any construction within the de facto wildlife corridor would be coordinated with the USFWS and no trees within the de facto wildlife corridor would be cleared without prior approval of the USFWS. In addition, no construction activities would occur to the LRGVNWR tracts on the landside of the levee or to the non-jurisdictional wetland.

Comment letters received are provided in Appendix D.

## 5.3 LIST OF CONTRIBUTORS

Table 5-2 lists contributors to the preparation of this EA and development of technical support studies regarding the proposed rehabilitation of the ACS.

**Table 5-2: List of Contributors to the Environmental Assessment**

| Name | Organization | Degree | Years Experience |
|---|---|---|---|
| Lisa Santana | USIBWC | Ph.D., Biology | 8 |
| Isela Canava | USIBWC | B.S., Civil Engineering | 11 |
| Deborah Blackburn | TRC | B.S., Biology | 10 |
| Barrett Clark | TRC | M.S., Biology | 5 |
| Jason Lancaster | TRC | B.S., Environmental Science | 15 |
| James Machin, P.E. | TRC | M.S., Environmental and Water Resources Engineering | 30 |
| Paul Matchen | TRC | M.A., Anthropology | 16 |
| Elia Perez | TRC | M.A., History | 18 |
| Michael Quigg | TRC | M.A., Archaeology | 38 |
| Molly Sandomire | TRC | M.S., Geography | 10 |
| Diane Thomas | TRC | M.S., Zoology and Physiology | 20 |
| Terri Myers | Preservation Central | M.A., American Studies | 25 |

# SECTION 6:

# REFERENCES

American Archaeology Group, LLC. (2004). *Archaeological Survey of Two Borrow Pits in Cameron County, Texas.* Lampasas, TX: Bradle, M.R. & Fuller, H.L.

Arroyo Colorado Watershed Partnership. (2010). *Arroyo Colorado Watershed Protection Plan Implementation, March 31, 2010 Quarterly Report*. Retrieved April 9, 2010, from http://www.arroyocolorado.org/projects/watershed-protection-plan-implementation.

Arroyo Colorado Watershed Partnership. (2007). *A Watershed Protection Plan for the Arroyo Colorado, Phase I*. College Station, Texas: Texas Water Resources Institute, Texas A&M AgriLife.

Blair, W.F. (1950). The Biotic Provinces of Texas. *Texas Journal of Science*, 2, 93 – 117.

Crosswhite, F.S. (1980). Dry Country Plants of the South Texas Plains. *Desert Plants*, 2(3), 141-179.

Geo-Marine, Inc. (2003). *An Assessment of Potential Effects to Historic Properties within the Lower Rio Grande Flood Control Project by Maintenance Activities of the U.S. International Boundary and Water Commission.* Plano, TX: Cooper, E., Reese, N., Shanabrook, D., Gibbs, V., & Peter, D.E.

Hanson, C.E., Towers, D.A., & Meister, L.D. (2006). *Transit Noise and Vibration Impact Assessment* (Federal Transit Administration Report No. FTA-VA-90-1003-06). Vienna, VA: Vanasse Hangen Brustlin, Inc.

Texas Commission on Environmental Quality. (2010, March). *Twelve TMDLs for Legacy Pollutants Factsheet.* Retrieved March 22, 2010, from http://www.tceq.state.tx.us/assets/public/implementation/water/tmdl/-07arroyoleg/07-arroyo_legacyfact.pdf.

Texas Commission on Environmental Quality. (2006). *Pollutant Reduction Plan for the Arroyo Colorado, Segments 2201 and 2202, Hidalgo, Cameron, and Willacy Counties.* Austin, Texas: Texas Commission on Environmental Quality.

Texas Comptroller of Public Accounts. (2008). *Quarterly Sales Tax Report – All Industries*. Retrieved April 09, 2010, from https://ourcpa.cpa.state.tx.us/allocation/HistSales.jsp.

Texas Department of Transportation. (2010). *FY 2010 Planned Projects: Pharr District*. Retrieved March 31, 2010, from http://apps.dot.state.tx.us/apps/rider55/projects.htm?view=dist&dist=Pharr

Texas Water Development Board. (2010). *2006 Regional Water Plan Population Projects for 2000 – 2060, Region M – Rio Grande*. Retrieved March 22, 2010, from http://www.twdb.state.tx.us/data/popwaterdemand/2003Projections/Population%20Projections/RegionM/Region_M_pop.htm.

Texas Water Development Board. (2010). *Water Information Integration and Dissemination System.* Retrieved March 31, 2010, from http://wiid.twdb.state.tx.us/.

Texas Water Development Board. (2006). *Aquifers of the Gulf Coast of Texas.* (Report 365). Austin, Texas: Mace, R.E., Davidson, S.C., Angle, E.S, & Mullican, III, W.F. (Eds.).

U.S. Army Corps of Engineers. (1991). *Cultural Resource Survey Arroyo Colorado (Lower Rio Grande Basin, Texas) Revalidation Report, Hidalgo and Cameron Counties, Texas.* Galveston, TX: Good, C.

U.S. Census Bureau. (2008). *2008 Population Estimates by County.* Retrieved March 22, 2010, from http://factfinder.census.gov/home/saff/main.html?_lang=en.

U.S. Census Bureau. (2000). *Dicennial Census 2000 Population Estimates by County and Census Tracts 119.03, 120, and 228.* Retrieved March 22, 2010, from http://factfinder.census.gov/home/saff/main.html?_lang=en.

U.S. Department of Agriculture, Natural Resources Conservation Service. (2010). *Web Soil Survey.* Retrieved February 10, 2010, from: http://websoilsurvey.nrcs.usda.gov/app.

U.S. Department of Transportation. (1980). *Guidelines for Considering Noise in Land Use, Planning and Control*. Washington, D.C.: Federal Interagency Committee on Urban Noise.

U.S. Environmental Protection Agency. (2010a). *Currently Designated Nonattainment Areas for All Criteria Pollutants.* Retrieved March 30, 2010, from http://www.epa.gov/air/oaqps/greenbk/ancl.html#TEXAS.

U.S. Environmental Protection Agency. (2010b). *Emissions by Category Report – Criteria Air Pollutants.* Retrieved April 09, 2010, from http://www.epa.gov/air/data/geosel.html.

U.S. Environmental Protection Agency. (2010c). *EnviroMapper for Envirofacts.* Retrieved March 30, 2010, from http://www.epa.gov/emefdata/em4ef.home.

U.S. International Boundary and Water Commission. (2010). *Work Plan for Cultural Resources Services for the Levee Rehabilitation of the Arroyo Colorado South Levee Located in Hidalgo and Cameron Counties, Texas.* Austin, TX: TRC Environmental Corporation.

U.S. International Boundary and Water Commission. (2009a). *Cultural Resources Survey: Improvements to the Divisor Dike and Arroyo Colorado North Levee Project.* (*Final).* Austin, TX: Parsons & Panamerican Consultants, Inc.

U.S. International Boundary and Water Commission. (2009b). *Environmental Assessment, Improvements to the Arroyo Colorado North Levee Project.* Austin, TX: Parsons Corporation.

U.S. International Boundary and Water Commission. (2008). *Final Programmatic Environmental Impact Statement, Improvements to the USIBWC Rio Grande Flood Control Projects along the Texas-Mexico Border.* Austin, TX: Parsons Corporation.

U.S. International Boundary and Water Commission. (2007). *Final Environmental Assessment, Improvements to the North and Main Floodways Levee Systems.* Austin, TX: Parsons Corporation.

U.S. International Boundary and Water Commission. (2003). *Hydraulic Model of the Rio Grande and Floodways within the Lower Rio Grande Flood Control Project.* Austin, TX: Parsons Corporation.

U.S. Fish and Wildlife Service. (2010). *Endangered and Threatened Wildlife and Plants*. 50 CFR 17.11 and 17.12. Retrieved February 10, 2010 from, http://www.access.gpo.gov/nara/cfr/waisidx_01/50cfr17_01.html

U.S. Fish and Wildlife Service. (2003). *Amended Biological Opinion.* (Consultation No. 2-11-91-F-144, May 23, 2003). Corpus Christi, TX: Strand, A.M.

# APPENDIX A:
# Detailed Maps of the Arroyo Colorado South Levee Project Area

Arroyo Colorado

Llano Grande Lake

North Levee

Pilot Channel

FM 1015

Progreso Wastewater Treatment Plant

Mercedes Main Canal

0

1

2

3

N

Miles

0 0.1 0.2 0.3

Levee Mile Markers

100 Foot Construction Corridor

Wildlife Corridor

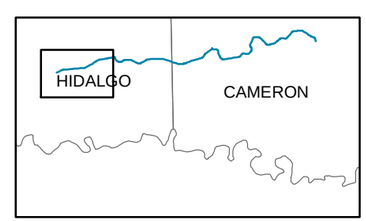
Borrow Pit

Drainage Ditch

Irrigation Canal

Pond

Stream



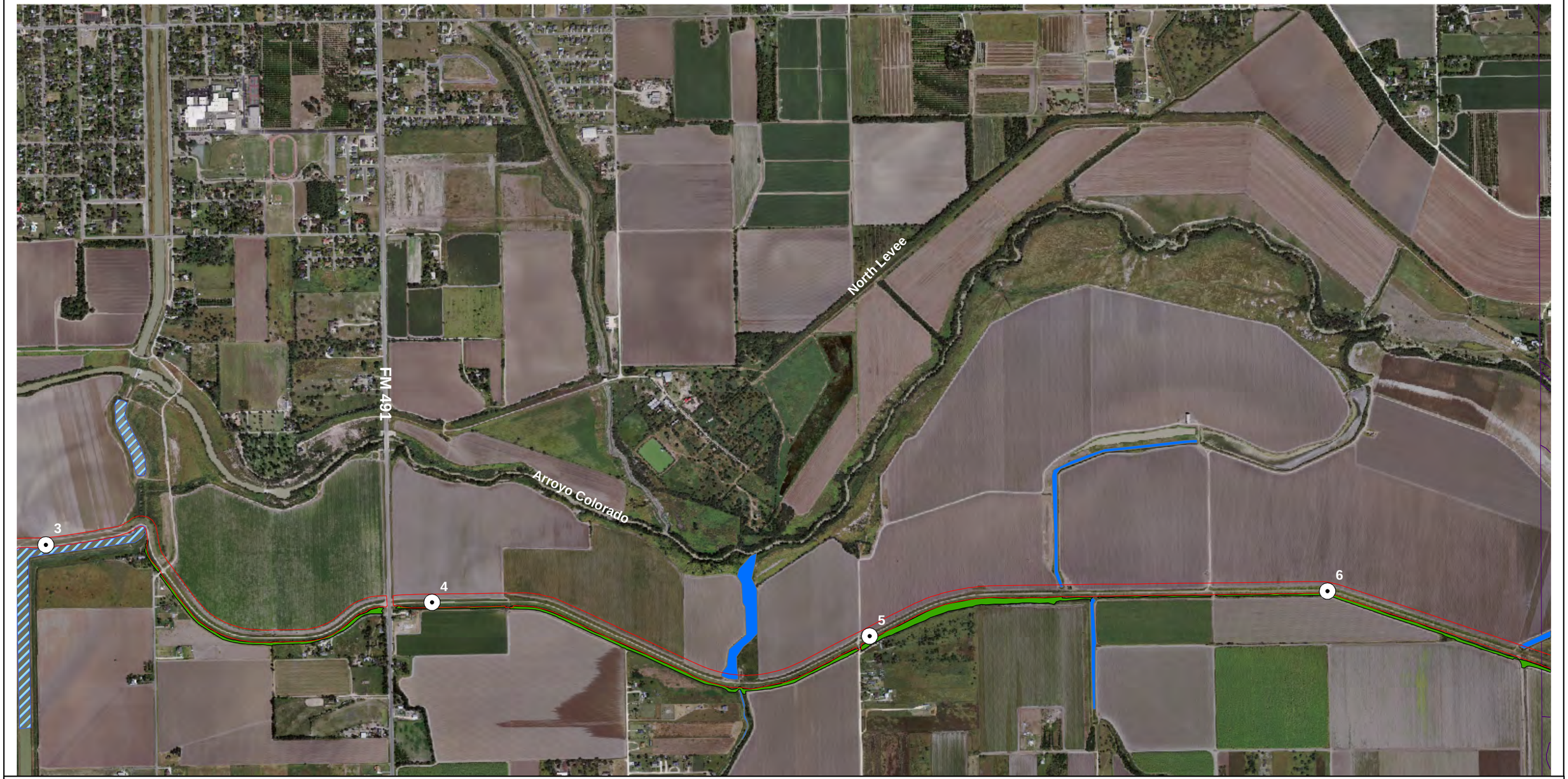

Source Aerial; National Geospatial Intelligence Agency (2009).

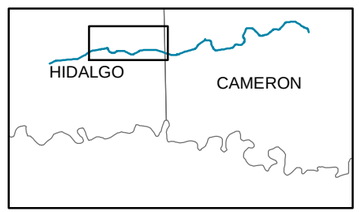
**FIGURE A-1**

**Arroyo Colorado South Levee Project**

Hidalgo County

International Boundary and Water Commission
United States Section




N

0 0.1 0.2 0.3 Miles

Levee Mile Markers
100 Foot Construction Corridor
Wildlife Corridor
Borrow Pit
Drainage Ditch
Irrigation Canal
Pond
Stream

Source Aerial; National Geospatial Intelligence Agency (2009).

**FIGURE A-2**

**Arroyo Colorado South Levee Project**

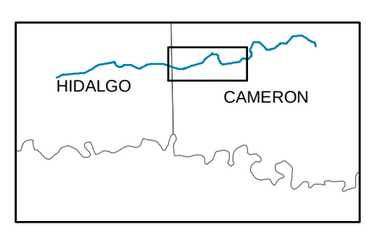
Hidalgo County

International Boundary and Water Commission
United States Section

N

Miles
0 0.1 0.2 0.3

Levee Mile Markers
100 Foot Construction Corridor
Wildlife Corridor
USFWS Refuge
Borrow Pit
Drainage Ditch
Irrigation Canal
Pond
Stream



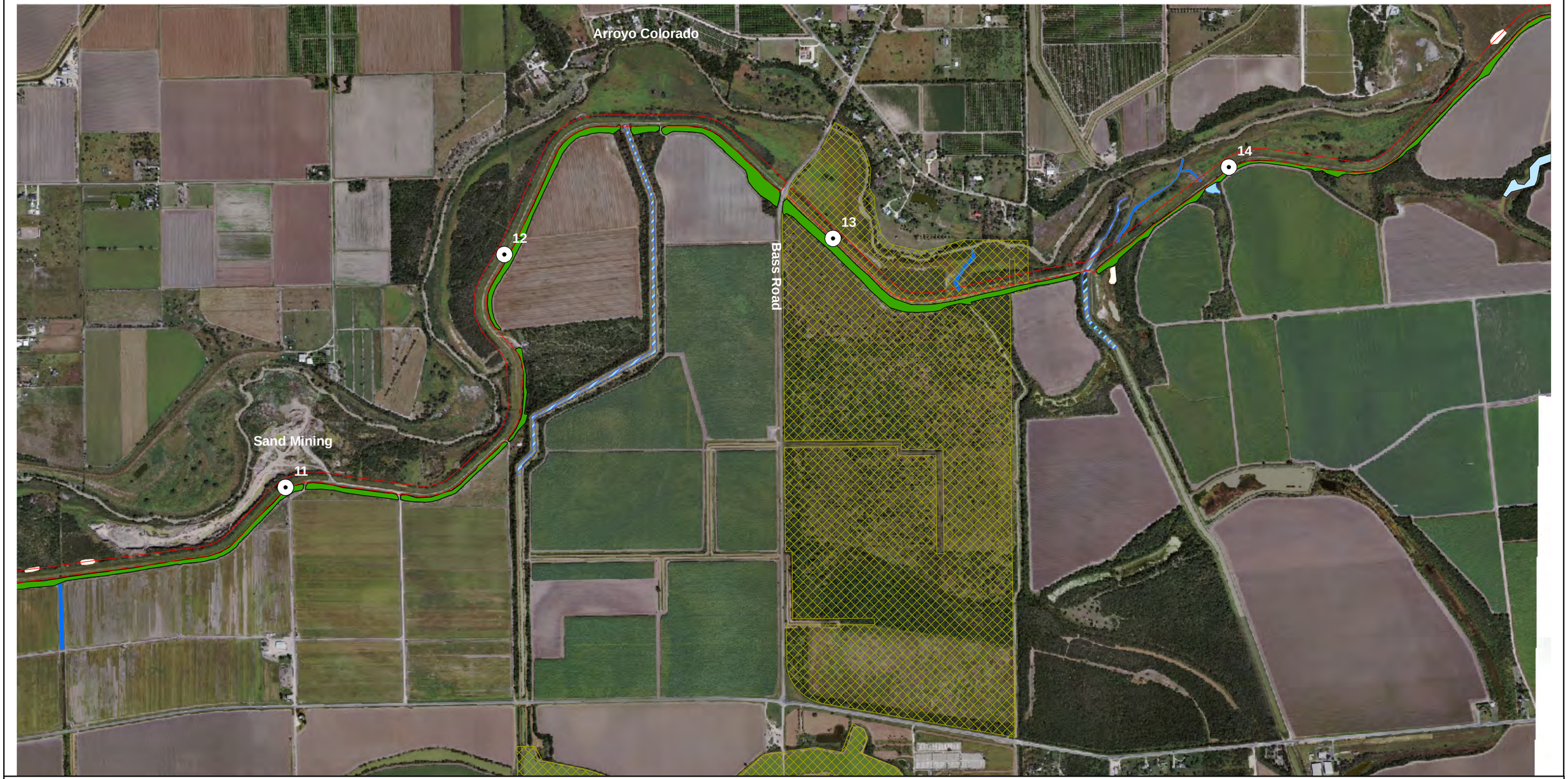

Source Aerial; National Geospatial Intelligence Agency (2009).

**FIGURE A-3**

**Arroyo Colorado South Levee Project**

Cameron County

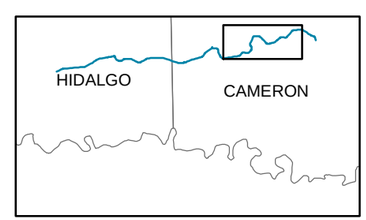
International Boundary and Water Commission
United States Section




N

0 0.1 0.2 0.3 Miles

Levee Mile Markers
100 Foot Construction Corridor
Wildlife Corridor
USFWS Refuge
Borrow Pit
Drainage Ditch
Irrigation Canal
Pond
Stream




Source Aerial; National Geospatial Intelligence Agency (2009).

**FIGURE A-4**

**Arroyo Colorado South Levee Project**

Cameron County

International Boundary and Water Commission
United States Section

# APPENDIX B:
# Biological Evaluation

# APPENDIX B

# BIOLOGICAL EVALUATION UPDATE FOR ARROYO COLORADO SOUTH LEVEE REHABILITATION PROJECT AREA

## SECTION 1 INTRODUCTION

The United States Section of the International Boundary and Water Commission (USIBWC) is preparing an Environmental Assessment (EA) for proposed flood control improvements along the Arroyo Colorado Floodway (ACF) located in Hidalgo and Cameron counties, Texas. The ACF is a component of the Lower Rio Grande Flood Control Project (LRGFCP) that conveys floodwater diverted from the Rio Grande to the Laguna Madre in the Gulf of Mexico and protects urban, suburban, and highly developed irrigated farmland along the Rio Grande delta in the United States and Mexico.

A biological resources survey was completed in 2005 as part of the Final Programmatic Environmental Impact Statement – Improvements to the USIBWC Rio Grande Flood Control Projects along the Texas-Mexico Border (USIBWC 2008). The biological resources survey was conducted to provide general descriptions of vegetation and wildlife in the Rio Grande and Tijuana River watersheds. The study area of the report included the LRGFCP in Hidalgo and Cameron counties, Texas.

A field reconnaissance survey was conducted by TRC Environmental Corporation (TRC) on February 22 through 26, 2010 to update the previous biological resources report information. The field reconnaissance was used to determine what vegetation types are present in the study area. Determining the current vegetation types allows a prediction of habitats available for wildlife, including threatened and endangered (T&E) species, which occur or may occur within the project area. The field reconnaissance also is used to determine if wetlands are present in the project area.

The Preferred Alternative involves improvements to the Arroyo Colorado South Levee system (ACS) from Farm to Market 1015 to Abd Road in order to address the 100-year flood protection criteria established by the Federal Emergency Management Agency (FEMA). Improvements to the ACS would include raising the levee by adding fill material to the existing levee to bring flood control to the original design specifications with a minimum of 3 feet of freeboard, the difference between the top of the levee or floodwall and the designed water elevation.

The following definitions are used in the description of the habitats present in the project area.

- River habitats: The Arroyo Colorado water body and the water in the tributaries that drain to the Arroyo Colorado. The river (i.e., arroyo) habitats include only the water, and do not include riparian habitats, vegetated islands, or sandbars.

- Riparian habitats: The transitional vegetation between the drier upland portions of the area and the arroyo or tributaries to the arroyo.

- Floodway: The area between the arroyo and the levees on both sides of the arroyo. In this survey, the floodway is restricted to the area between the arroyo and the south levee.

- Irrigation canals: The excavated drainages that provide water from the Rio Grande to irrigate agricultural lands.

- Drainage ditches: Excavated and natural drainages, including the ditches adjacent to and paralleling the south levee (i.e., levee borrow ditches), that receive surface and sub-surface water from agricultural lands.

- Riverside of levee: The area from the center of the south levee toward the ACF.

- Landside of levee: The area from the center of the south levee extending away from the ACF. The landside of the levee generally is not subject to the same flooding conditions as the floodway unless the levee is overtopped.

- Right-of-way (ROW): The areas on the riverside and landside of the levee managed by the USIBWC. The USIBWC has access to the ROW through land easements.

- Survey area: The area laterally extending approximately 25 feet beyond the toe on either side of the levee along the length of the existing ACS ROW.

- Existing levee footprint: The current width of the levee without any improvements or changes. For the purposes of this report, the existing levee footprint is assumed to be 76 feet. For the purposes of this BE, the length of the existing levee footprint is approximately 16 miles.

- De facto wildlife travel corridor: The area located on the landside of the levee associated with the drainage ditch located beyond the levee toe and running parallel to the levee within the USIBWC ROW.

- Construction corridor: The area of the levee identified as having deficiencies, where fill would be added to the top of the levee to provide adequate flood control. The construction corridor also includes areas where staging of equipment and/or materials would occur. The construction corridor is assumed to be the area 100 feet from the centerline of the levee on the riverside and to the riverside edge of the existing de facto wildlife travel corridor on the landside.

This Biological Evaluation (BE) was prepared in support of the environmental assessment (EA) to summarize the results of the natural resources field surveys, including habitat, wetlands, and T&E species habitat evaluations. The BE is organized into the following sections:

- *Section 1 – Introduction*: Describes the purpose of this report.

- *Section 2 – Project Description*: Describes the levee system and the Preferred Alternative for the improvement of flood control capacity.

- *Section 3 – Vegetation*: Describes the methods and results of surveys conducted to identify and characterize plant communities within the potential area of influence of the levee improvement project.

- *Section 4 – Wetlands*: Describes the methods and results of surveys conducted to determine if potential jurisdictional wetlands are present within the survey area.

- *Section 5 – Wildlife*: Describes the evaluation of wildlife, T&E species, and migratory birds based on habitat present within the survey area.

- *Section 6 – References*: Literature cited in the text of the EA.

## SECTION 2 PROJECT DESCRIPTION

The LRGFCP extends approximately 180 miles from Peñitas, Texas, to the Gulf of Mexico. Under an agreement between the United States and Mexico, the LRGFCP was constructed to protect urban, suburban, and highly developed irrigated farmlands in the Rio Grande delta from floods in both countries. The Rio Grande delta is located within the Lower Rio Grande Valley (LRGV) area, which is comprised of Starr, Hidalgo, Cameron, and Willacy counties. The ACS rehabilitation project area includes approximately 16 miles of the Arroyo Colorado south levee, which is surrounded primarily by agricultural lands (e.g., cropland and rangeland). The hydraulic modeling evaluation of the ACS indicated that an increase in levee height would be needed in a number of sections in order to meet design criteria for flood protection by FEMA.

The existing levee is a raised, trapezoidal, compacted earthen structure with a crown width of 16 feet, a typical height ranging from 10 to 15 feet, and an approximate 3:1 to 4:1 side slope ratio (horizontal feet per foot of height; [H:V]). The existing levee footprint typically ranges from 70 to 140 feet, depending on location.

The Preferred Alternative would increase flood containment capacity by raising the elevation of the levee up to an additional 6 feet in height for improved flood control. Fill material from commercial sources would be added to the existing levee to rehabilitate the levee to its original design specifications (i.e., to meet a 3-foot freeboard design criterion). Addition of fill material to the top of the levee would extend the footprint beyond the riverside and landside toes of the existing levee. Levee footprint expansion would occur within the maintained floodway and within the USIBWC right-of-way (ROW). However, in order to minimize footprint expansion due to raising the levee, both landside and riverside slopes would be steepened up to 2.5:1 H:V. In some reaches of the levee system, if required by the presence of irrigation structures or other constraints, expansion would be made with an offset centerline, placing the additional footprint on only one side of the existing levee.

Other modifications to the levee would include construction of a 15-foot wide access road on both the riverside and landside of the levee and widening of the levee crown to 16 feet where necessary. The riverside edge of the existing wildlife corridor would serve as the limits of construction for the landside of the levee, to the maximum extent practicable. The need for excavation outside of the levee structure is not anticipated.

Any staging areas for heavy equipment or soil storage needed for construction activities associated with the Preferred Alternative would be located outside the ACS ROW. Vehicles would access the project area by means of existing levee access roads or farm roads. No new haul roads would be constructed. The majority of the work to raise the levee would occur on top of the existing levee. Dump trucks would carry commercially obtained fill material to the top of the levee. Areas requiring placement of fill material on the sides of the embankments would be accessed from the top of the levee road and spread over the embankments until the desired thickness has been reached. After releasing a load of fill, a motorgrader would follow behind to compact fill to the required height. After increasing the height of the levee and extending the footprint, the easement area adjacent to the levee up to 100 feet from the centerline on the

riverside and to the riverside edge of the existing wildlife corridor where necessary, would be compacted.

# SECTION 3 VEGETATION

## 3.1 Regional Vegetation

The ACS is within the Matamoran Biotic District subdivision of the Tamaulipan Biotic Province and is in a transition zone between temperate and tropical climates (Blair 1950). The native vegetation type covering much of southern Texas and northeastern Mexico is mesquite-grassland. The Tamaulipan thornscrub, a subtropical semi-arid vegetation type, occurs on both sides of the Rio Grande. Spiny shrubs and trees dominate this thornscrub, but grasses, forbs, and succulents also are prominent (Crosswhite 1980). Exceptions to the arid shrub-covered landscapes are areas of dense riparian vegetation within the few river valleys. Species composition and distribution throughout the region usually are a function of soil and geological formations. Most of the natural vegetation in southern Hidalgo and Cameron counties, however, has been replaced by cropland and urban development. Much of the off-river floodway system on the United States side is used for agriculture, including grain sorghum, cotton, and a variety of vegetables. A detailed description of regional vegetation is provided in the Final *Programmatic Environmental Impact Statement, Improvements to the USIBWC Rio Grande Flood Control Projects along the Texas-Mexico Border* (PEIS; USIBWC 2008).

## 3.2 Vegetation within the Project Area

Vegetation communities along and adjacent to the survey area also were evaluated during the February 2010 field reconnaissance survey to identify vegetation communities, potential jurisdictional wetlands, and potential T&E species habitat. Where accessible, the area surveyed extended approximately 25 feet laterally beyond the toe of the levee along the length of the existing ACS ROW, which is regularly maintained by the USIBWC. Many portions of the surveyed area were bounded by landowner fences.

Vegetation classifications for the project area are adapted from Diamond (1993) and the 1996 National Vegetation Classification System used by the U.S. Fish and Wildlife Service (USFWS) and Texas Parks and Wildlife Department (TPWD). Additional information was provided by the vegetation inventories of Texas by Correll and Johnston (1979) and Taylor et al. (1994). Vegetation communities were delineated from color aerial photography and field verified using a global positioning system (GPS). Based on literature review and information acquired during field surveys, herbaceous, woodland/thornscrub, wetland, riparian, and agricultural vegetation communities were identified within the project area. Other areas such as open water, developed land, and urban areas also were identified within the project area.

The majority of land on either side of the south levee in Hidalgo County and on the landside of the south levee in Cameron County is agricultural land. Many areas along the ACF in Cameron County are being used for commercial sand mining operations and are characterized by pioneering and invasive grasses and forbs. The majority of vegetation along the landside of the survey area is associated with the south levee drainage ditches, located between the south levee and adjacent agricultural lands. The drainage ditches typically consist of either herbaceous vegetation or a narrow band of woody vegetation that is associated with a de facto wildlife travel

corridor (USFWS 2003). The species compositions of the communities along the drainage ditches generally are similar to those of the communities in the surrounding area. Several former levee borrow sites also are present along the ACS. Two tracts of the Lower Rio Grande National Wildlife Refuge (LRGNWR) occur within the project area. A narrow tract occurring in a corridor on both sides of the Willacy Irrigation Canal intersects the ACS approximately at levee mile 7 and is associated with the irrigation canal riparian vegetation community. The second tract is located at levee mile 13 and is associated with the woodland/thornbrush vegetation community. Figures presenting wetlands, waterbodies, USFWS LRGNWR tracts, and the de facto wildlife travel corridor that are located within the project area are included in Appendix A and the Waters of the U.S. Delineation Report (Appendix C).

***Herbaceous Vegetation Associations***

Most herbaceous vegetation communities are associated with USIBWC levee slopes and some portions of the floodway. The grasslands along the levee slopes include native and non-native vegetation and are dominated by King Ranch bluestem (*Bothriochloa ischaemum* var. *songarica*) and buffelgrass (*Pennisetum ciliare*), and sand dropseed (*Sporobolus cryptandrus*). Common herbs and forbs include Bermudagrass (*Cynodon dactylon*), cane bluestem (*Bothriochloa barbinodis*), common sunflower (*Helianthus annuus*), silverleaf nightshade (*Solanum elaeagnifolium*), Virginia plantain (*Plantago virginica*), Virginia pepperweed (*Lepidium virginicum*), and sandmat (*Chamaesyce* sp.). Areas of levee slopes that are infrequently maintained support young, woody vegetation including honey mesquite (*Prosopis glandulosa*), retama (*Parkinsonia aculeata*), and lotebush (*Ziziphus obtusifolia*). Within the survey area, the herbaceous vegetation communities along the levee typically transition into the vegetation communities of the adjacent tract within the floodway.

Several old-field communities (including historic pasture, rangeland, and mining tracts) are located along the ACF. These diverse communities are established by pioneering species on disturbed lands, primarily former rangelands and historic sand mining tracts. Most are dominated by herbaceous vegetation including King Ranch bluestem, buffelgrass, sand dropseed, and Bermudagrass. Additional herbaceous species include cane bluestem, common sunflower, silverleaf nightshade, Virginia pepperweed, Carolina wolfberry (*Lycium carolinianum* var. *quadrifidum*), sea oxeye daisy (*Borrichia frutescens*), Texas varilla (*Varilla texana*), Rio Grande beebrush (*Aloysia macrostachya*), and Lindheimer's bladderpod (*Lesquerella lindheimeri*). Some old-field communities support scattered woody vegetation, including young mesquite, retama, lotebush, and huisache (*Acacia farnesiana*).

***Woodland/Thornscrub Associations***

The woodland/thornscrub communities occur over moderately to poorly drained soils and are a natural disturbance type associated with river floodplains and depressions that may eventually succeed to sugarberry-dominated forests. Few areas of mesquite/mixed brush and mesquite/acacia woodland/thornscrub communities are present within the survey area in Hidalgo County, and these areas are narrow tracts that typically are associated with the de facto wildlife travel corridor and drainage ditches. Several areas of woodland/thornscrub communities are located within the survey area in Cameron County, and these woodland/thornscrub communities

are moderately diverse and are primarily comprised of mesquite/mixed brush and mesquite/acacia woodland/thornscrub from the Hidalgo-Cameron county line to near County Road 506. East of County Road 506, the woodland/thornscrub communities transition to mesquite/Texas ebony dominated communities. Common species identified for the woodland/thornscrub communities included honey mesquite, huisache, retama, Texas ebony (*Pithecellobium flexicaule*), granjeno (*Celtis ehrenbergiana*), coyotillo (*Karwinskia humboldtiana*), coma (*Sideroxylon celastrinum*), snake eyes (*Phaulothamnus spinescens*), brasil (*Condalia hookeri*), desert yaupon (*Schaefferia cuneifolia*), lotebush, goatbush (*Castela erecta* var. *texana*), Spanish dagger (*Yucca treculeana*), Texas pricklypear (*Opuntia engelmannii* var. *lindheimeri*), tasajillo (*Cylindropuntia leptocaulis*), snailseed (*Cocculus diversifolius*), blood sage (*Salvia coccinea*), buffelgrass, and King Ranch bluestem.

Several former levee borrow sites supporting hydrophytic vegetation were identified along the ACS; however, observed soil in excavated pits within these non-wetland borrow sites did not exhibit hydric properties, which is one of the three criteria required by the United States Army Corps of Engineers (USACE) for the classification of wetlands. Common species identified for the former borrow sites include pale spikerush (*Eleocharis macrostachya*), common frogfruit (*Phyla nodiflora* var. *reptans*), bigfoot waterclover (*Marsilea macropoda*), upright burhead (*Echinodorus berteroi*), and retama. Fringe vegetation around the former levee borrow sites included sea oxeye daisy, Carolina wolfberry, Lindheimer bladderpod, sand dropseed, flatsedge (*Cyperus* sp.), retama, honey mesquite, and huisache.

### *Wetlands and Riparian Vegetation Associations*

#### *Floodway Drainage Ditches*

Riparian vegetation within the survey area is associated primarily with agricultural drainage ditches and includes native and non-native woody and herbaceous vegetation. Woody vegetation in some areas is relatively young due to routine maintenance or agricultural activities. Areas with less frequent maintenance, including ditches with very steep slopes, support larger trees and denser vegetation. Common riparian species include black willow (*Salix nigra*), retama, huisache, honey mesquite, sugarberry (*Celtis laevigata*), Texas ebony, common reed (*Phragmites australis*), southern cattail (*Typha domingensis*), sea oxeye daisy, greenbriers (*Smilax* sp.), balloon vine (*Cardiospermum halicacabum*), pale spikerush, King Ranch bluestem, and buffelgrass. Areas of drainage ditches that exhibit a stronger upland vegetation component support species including lotebush, granjeno, and Texas pricklypear. Many of the drainage ditches have moderate to severe erosion, with some slopes supporting little to no vegetation. Most drainage ditch slopes are relatively steep, limiting the lateral extent of riparian vegetation along the ditches. Three of the drainage ditches contain open, deepwater habitat.

#### *Drainage/Levee Borrow Ditches*

The vegetation communities within the drainage ditches that are adjacent and parallel to the ACS and associated with the de facto wildlife travel corridor typically reflect those of the surrounding areas, with some localized areas of hydrophytic vegetation within the channel, including young black willows, southern cattails, and common reeds. Some areas of the drainage ditches contain

primarily upland vegetation communities with vegetation such as buffelgrass, King Ranch bluestem, honey mesquite, lotebush, Texas pricklypear, granjeno, and Spanish dagger.

***Emergent Wetland (Former Levee Borrow Site)***

As previously stated, several former levee borrow sites supporting hydrophytic vegetation were identified along the ACS; however, only one 0.1-acre former levee borrow site was observed with soil that exhibited hydric properties. The vegetation community at this site was similar to those of the non-wetland former borrow sites.

***Open Water***

Waterbodies within the ACS project area primarily are associated with the agricultural drainage ditches and irrigation canals. These small riverine systems are characterized by riparian vegetation. Most drainage ditch slopes are relatively steep, limiting the lateral extent of riparian vegetation along the ditches. Many of the agricultural drainage ditches have moderate to severe erosion, with some slopes supporting little or no vegetation. These drainage ditches typically are seasonally to temporarily flooded and receive surface and sub-surface water from agricultural fields. Three of the drainage ditches contain open deepwater habitat, as do the irrigation canals, which also support herbaceous vegetation.

***Agricultural***

The majority of the land uses in the project area are related to agriculture, including cropland (particularly in Hidalgo County) and rangeland. Croplands are areas subject to cultivation of crops, including cotton, grain sorghum, and a variety of vegetables. Rangelands are areas subject to grazing by cattle, goats, and sheep.

## 3.3 Levee Post-Construction Vegetation

The results of the on-site vegetation surveys indicate that primarily herbaceous plant communities, including non-native grasslands, agricultural lands, rangelands, and old-field communities, would be impacted from implementation of the Preferred Alternative, along with areas of woodlands/thornscrub and drainage ditches (i.e., riparian communities). The Preferred Alternative would remove up to 147 acres of non-native herbaceous vegetation on the existing levee slopes, approximately 28 acres of agricultural land, 34 acres of rangeland, 0.8 acre of old-field, 14.7 acres of woodland/thornscrub (including the USFWS LRGNWR tract near levee mile 13), 2 acres of borrow pits, and 2.6 acres of riparian (including the drainage ditches [0.8-acre], irrigation canals [0.2-acre], and the de facto wildlife travel corridor [8.3 acres]) communities adjacent to the levee.

Vegetation removal would occur on the levee slopes and adjacent, narrow strips of land for expansion where fill would be added along the riverside and landside of the levee. Following levee construction activities, native grasses would be seeded on both the levee slopes and adjacent areas as soon as possible after project completion; therefore, the loss of non-native herbaceous vegetation would not diminish overall population sizes or plant communities.

Prompt restoration of native vegetation would allow for efficient establishment and would provide additional erosion control.

# SECTION 4 WETLANDS

## 4.1 Regional Wetlands

Wetlands perform valuable functions in restoring and maintaining the quality of the nation's waters. These functions include floodwater storage, sediment trapping, nutrient removal, chemical detoxification, aquatic food chain support, fish and wildlife habitat, and groundwater recharge. Over the past several centuries, the Rio Grande has meandered across its lower floodplain near the Gulf of Mexico. Geological remnants of this process include isolated oxbow lakes (i.e., resacas), linear channel segments, and small pools associated with the historic river channel. Over time, these wetland areas developed into habitats of unique value and they often support water-tolerant woody species along the wetland fringes. Resacas contribute to high biodiversity in the LRGV and provide important habitat for migratory birds and resident wildlife. In addition to wetlands, other manmade waters including settling basins, ditches, canals, reservoirs, and lakes, occur throughout the region. Although these manmade waters primarily were designed for flood control and irrigation purposes, they often are lined with vegetation that supports wildlife and they serve as travel corridors for some wildlife species.

## 4.2 Wetlands and Waterbodies within the Project Area

A wetland delineation was conducted by TRC on February 22 through 26, 2010 to determine the jurisdictional status and location of wetlands relative to the levee construction corridor. Historical topographic maps were used to identify existing wetlands features in existence prior to levee construction and associated borrow pit excavations. Wetlands and waterbodies within the project area were identified and characterized in the Waters of the U.S. Delineation Report (Appendix C). Figures presenting wetlands, waterbodies, and the de facto wildlife travel corridor located within the project area are included in the Waters of the U.S. Delineation Report.

The wetland delineation was conducted by qualified TRC wetland scientists within the project area in February 2010, using methods described in the USACE *Wetlands Delineation Manual* (USACE and Environmental Laboratory 1987). Methods used are consistent with the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region* ([Regional Supplement] USACE 2008). The project spatial boundaries were mapped during initial site reconnaissance and confirmed by aerial photograph interpretation. The survey area was examined for the presence of atypical situations via site reconnaissance to identify any recent natural or human-induced alteration that may have significantly changed the area vegetation, soils, and/or hydrology.

Wetlands within the ACS survey area can be classified into two systems: palustrine and riverine. *Palustrine systems* are all nontidal wetlands dominated by trees, shrubs, and other vegetation. Small palustrine systems associated with low-lying areas, including former levee borrow sites, exist in the survey area. *Riverine systems* are all wetlands and deepwater habitats within a river channel. Small riverine systems associated with agricultural irrigation canals and drainage ditches exist in the survey area.

Waterbodies within the survey area are primarily associated with the small riverine systems within channels along irrigation canals, agricultural drainage ditches, and the de facto wildlife travel corridor. These riverine systems are associated with riparian vegetation, which is restricted to an area approximately 10 to 15 feet beyond the ordinary high water mark. Many of the agricultural drainage ditches have moderate to severe erosion, with some slopes supporting little or no vegetation. Most drainage ditch slopes are relatively steep, limiting the lateral extent of riparian vegetation along the ditches. These drainage ditches typically are seasonally or temporarily flooded and receive surface and sub-surface water from agricultural fields. Three of the drainage ditches contain open deepwater habitat.

One 0.1-acre non-jurisdictional palustrine wetland is associated with a former levee borrow site that supports emergent hydrophytic vegetation.

# SECTION 5 WILDLIFE

## 5.1 Regional Wildlife

Common wildlife species in the region include whitetail deer, turkey, javelina, bobwhite quail, scaled quail, white-winged dove, mourning dove, cottontail rabbit, jackrabbit, various waterfowl species, and many species of nongame birds. The region also provides important wintering habitat for thousands of migratory birds including many species of passerines, raptors, shorebirds (e.g., sandhill cranes), ducks, and geese. In addition, a number of unique and rare animals occur in the region (Section 5.2.1 of this EA). Many of the terrestrial wildlife species in the project area are limited in their distribution either partially or entirely to the Tamaulipan Biotic Province, with some only found in the LRGV.

Approximately 67 mammals potentially occur in the LRGV. The mammals are dominated by rodents (24 species) and bats (13 species). Some common mammals that may be encountered in the LRGV are the common raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), coyote (*Canis latrans*), Mexican ground squirrel (*Spermophilus mexicans*) and bobcat (*Felis rufus*) (USIBWC 2008).

Approximately 484 species of birds potentially occur in the LRGV. Dominant taxonomic groups include wood warblers (44 species), geese and ducks (30 species), sparrows and towhees (26 species), raptors (25 species), and tyrant flycatchers (25 species). Many of these birds migrate along the Central and Mississippi flyways, which converge in this region of south Texas. Common species of birds include the ground-dove (*Columbia passerine*), golden-fronted woodpecker (*Melanerpes aurifrons*), northern mockingbird (*Mimus polyglottos*), and great-tailed grackle (*Quiscalus mexicanus*), indigo bunting (*Passerina cyanea*), orchard oriole (*Icterus spurius*), green heron (*Butorides virescens*), black-chinned hummingbird (*Archilochus alexandri*), mallard (*Anas platyrhynchos*), greater yellowlegs (*Tringa melanoleuca*), laughing gull (*Larus atricilla*), belted kingfisher (*Ceryle alcyon*), sharp-shinned hawk (*Accipiter striatus*), scarlet tanager (*Piranga olivacea*), Mississippi kite (*Ictinia mississippiensis*), broad winged hawk (*Buteo platypterua*), Wilson's phalarope (*Phalaropus tricolor*), and Franklin's gull (*Larus pipixcan*) (USIBWC 2008).

Approximately 76 species of amphibians and reptiles may also occur in the LRGV. The reptiles are represented by snakes (29 species), lizards (19 species), turtles (five species), and one alligator. Amphibians are represented by frogs and toads (18 species) and salamanders (four species) (USIBWC 2008). Snake species include water snakes (*Nerodia* spp.), rat snakes (*Elaphe* spp.), western diamondback rattlesnake (*Crotalus atrox*) and the Texas coral snake (*Micrurus fulvius tener*). Lizards in the area include whiptails (*Cnemidophorus* spp.), skinks (*Eumeces* spp.), introduced Mediterranean gecko (*Hemidactylus turcicus*), and the green anole (*Anolis carolinensis*). Turtle species include the red-eared slider (*Trachemys scripta elegans*), Texas spiny soft-shelled turtle (*Apalone spinifera*), ornate box turtle (*Terrapene ornata ornata*), Texas tortoise (*Gopherus berlandieri*), and the yellow mud turtle (*Kinosternon flavescens flavenscens*). The American alligator (*Alligator mississippiensis*) also has been recorded in the LRGV (USIBWC 2008).

## 5.2 Federally Listed Threatened and Endangered Species

The potential for T&E species habitat within the project area was evaluated based on a February 2010 on-site survey conducted by TRC, as well as information and data obtained on habitat requirements of T&E species potentially occurring in the area. Sources of information included T&E species lists published by natural resource agencies and scientific literature.

### 5.2.1 *Status and Life History of Potentially Impacted Federally Listed Species*

Many of the 15 federally listed species for Hidalgo and Cameron counties are unlikely to occur within or adjacent to the project area because of the absence of suitable habitat. Marine species that would not occur in the project area include West Indian manatee, Atlantic hawksbill sea turtle, green sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, and loggerhead sea turtle. The brown pelican has been federally delisted and is in recovery and being monitored. Plant species such as star cactus, which is typically found on gravelly clays or loams (Catarina, Catahoula, and Frio soils), and Walker's manioc, which is typically found on sandy-loam soils underlain by caliche, are unlikely to occur in the project area based on the lack of suitable soil types present in the project area.

No T&E species were observed during the February 2010 survey. Brief natural histories, habitat requirements, and assessments of the presence of suitable habitat in the project area are provided in Table 1 for federally listed species potentially occurring within the project area.

## Table 1 – Federally Listed Threatened and Endangered Species with Potential to Occur in Hidalgo and Cameron Counties

| Species Common Name | Scientific Name | USFWS[1] | County[2] | Preferred Habitat in South Texas | Suitable Habitat in Project Area? |
|---|---|---|---|---|---|
| **WILDLIFE** | | | | | |
| Brown pelican | *Pelecanus occidentalis* | R | C | Found largely in coastal and near shore areas, where it roosts and nests on islands and spoil banks | N |
| Northern aplomado falcon | *Falco femoralis septentrionalis* | LE | C, H | Inhabits open grasslands and savannas containing tall cacti, tree yuccas, and open stands of tall pines and oaks | Y |
| Piping plover | *Charadrius melodus* | LT | C | Wintering migrant along the Texas Gulf coast; found on beaches and bayside mud- or saltflats | Y |
| Green sea turtle | *Chelonia mydas* | LT | C | Found in Gulf and bay system, in shallow water seagrass beds, in open water between feeding and nesting areas, and on barrier island beaches | N |
| Hawksbill sea turtle | *Eretmochelys imbricate* | LE | C | Warm, shallow waters in the Gulf and bay system, especially in rocky marine environments such as coral reefs and jetties | N |
| Kemp's ridley sea turtle | *Lepidochelys kempii* | LE | C | Gulf and bay system; adults found within shallow waters of Gulf of Mexico; feed primarily on crabs and also on snails, clams, other crustaceans, and plants | N |
| Leatherback sea turtle | *Dermochelys coriacea* | LE | C | Found in Gulf and bay system | N |
| Loggerhead sea turtle | *Caretta caretta* | LE | C | Juveniles mostly found in Gulf and bay systems; adults are the most pelagic of sea turtles | N |
| Jaguarundi | *Herpailurus yaguarondi* | LE | C, H | Inhabits thick dense thorny brush and shrubland | Y |
| Ocelot | *Leopardus pardalis* | LE | C, H | Inhabits thick dense thorny brush and shrubland | Y |
| West Indian manatee | *Trichechus manatus* | LE | C | Found in Gulf and bay system; opportunistic aquatic herbivore | N |
| **PLANTS** | | | | | |
| South Texas ambrosia | *Ambrosia cheiranthifolia* | LE | C | Occurs at low elevations in open clay-loam to sandy-loam prairies and savannas; only known from Kleburg and Nueces Counties, Texas. | Y |
| Star cactus | *Astrophytum asterias* | LE | C, H | Occurs in sparsely vegetated areas with gravelly, saline clays or loams at low elevations in the Rio Grande Plains; known populations in Starr County, Texas | N |

## Table 1 – Federally Listed Threatened and Endangered Species with Hidalgo and Cameron Counties (Continued)

| Species Common Name | Scientific Name | USFWS[1] | County[2] | Preferred Habitat in South Texas | Suitable Habitat in Project Area? |
|---|---|---|---|---|---|
| Texas ayenia | *Ayenia limitaris* | LE | C, H | Occurs at low elevations in dense subtropical woodland communities; prefers well-drained, heavy soils on riparian terraces with close to 95 percent canopy cover | Y |
| Walker's manioc | *Manihot walkerae* | LE | C, H | Species typically occurs on periphery of native brush in sandy loam underlain by caliche; flowers April to September | N |

[1] - USFWS: LE = endangered, LT = threatened, R = delisted, in recovery and monitored

[2] - C = Cameron County, H = Hidalgo County

Source: USFWS 2010

### *Piping Plover*

The piping plover (*Charadrius melodus*) is a federally and state-listed threatened species in Cameron County, Texas (TPWD 2010a). Piping plovers breed only in North America in three geographic regions: the Atlantic Coast, the Northern Great Plains, and the Great Lakes. Piping plovers from all three breeding populations winter along South Atlantic, Gulf Coast, and Caribbean beaches and barrier islands, primarily on intertidal beaches with sand flats and/or mudflats with no or very sparse vegetation. In recent decades, populations have drastically declined, especially in the Great Lakes. Piping plovers arrive at breeding grounds from mid-March through mid-May and remain for 3 to 4 months per year. In places, breeding habitat has been replaced by shoreline development and recreation. Plovers depart for the wintering grounds from mid-July through late October. Availability of quality foraging and roosting habitat in the wintering grounds is necessary in order to ensure that an adequate number of adults survive to migrate back to breeding sites and successfully nest. Breeding and wintering piping plovers feed by probing for invertebrates at or just below the surface on exposed wet sand in wash zones, intertidal ocean beaches, wrack lines, washover passes, mudflats, sand flats, and algal flats, as well as shorelines of streams, ephemeral ponds, lagoons, and salt marshes. They use beaches adjacent to foraging areas for roosting and preening. Small sand dunes, debris, and sparse vegetation on adjacent beaches provide shelter from wind and extreme temperatures.

### *Northern Aplomado Falcon*

The northern aplomado falcon (*Falco femoralis septentrionalis*) is a federally and state-listed endangered species in Hidalgo and Cameron counties (TPWD 2010a). The species was nearly extirpated, but a reintroduction program has produced some nesting pairs since the 1990s, primarily in New Mexico and south Texas. The species inhabits open country, especially savanna and open woodland, and sometimes occurs in very barren areas, grassy plains, and valleys with scattered mesquite, yucca, and cactus in the South Texas and Trans-Pecos regions of Texas (TPWD 2010a). The falcons capture small birds, insects, rodents, and reptiles, and initiate capture from tree perches using a horizontal flight pattern. The species utilizes stick nests created by other species (e.g., crows, ravens, and hawks). They prefer open terrain with scattered trees and/or shrubs (USFWS 1990).

### *Jaguarundi*

The jaguarundi (*Herpailurus yaguarondi*) is a federally and state-listed endangered species in Hidalgo and Cameron counties (TPWD 2010a). The habitat of the jaguarundi includes dense thornscrub with greater than 95 percent canopy cover. Potential habitat includes four areas of the LRGV: Mesquite-Granjeno Parks, Mesquite-Blackbrush Brush, Live Oak Woodlands/Parks, and Rio Grande Riparian (TPWD 2010a). Habitat loss and fragmentation from agriculture and development, especially along the Rio Grande, are the primary causes of population decline.

***Ocelot***

The ocelot (*Leopardus pardalis*) is a federally and state-listed endangered species in Hidalgo and Cameron counties (TPWD 2010a). This species is found from the southern tip of Texas and Arizona and northern Mexico into northern Argentina, Paraguay, and Uruguay. The habitat of the ocelot is similar to that of the jaguarundi and includes dense thornscrub with greater than 95 percent canopy cover. Potential habitat includes four areas of the LRGV: Mesquite-Granjeno Parks, Mesquite-Blackbrush Brush, Live Oak Woodlands/Parks, and Rio Grande Riparian (TPWD 2010a). Habitat loss and fragmentation from agriculture and development, especially along the Rio Grande, are the primary causes of population decline.

***Texas Ayenia***

The Texas ayenia (*Ayenia limitaris*) is a federally and state-listed endangered plant species in Hidalgo and Cameron counties (TPWD 2010a). This species occupies dense subtropical thorn woodland or tall shrubland on well-drained calcareous sandy clay loam (Hidalgo Series soil type) and neutral to moderately alkaline, fine sandy loam (Willacy Series soil type). The current known population in Texas is within the Texas Ebony-Anacua plant community (NatureServe 2009). This plant community occurs on well-drained riparian terraces with canopy cover of close to 95 percent. Plants growing in association with this species include coma (*Sideroxylon celastrinum*), brasil (*Condalia hookeri*), mesquite, lotebush, lime pricklyash (*Zanthoxylum fagara*), snake-eyes (*Phaulothamnus spinescens*), and granjeno (TPWD 2010b). Coma and lime pricklyash were not documented in the survey area, but granjeno was common throughout most of the survey area and co-occurred with brasil and snake-eyes in a small tract of thornbrush/woodlands near levee mile 12, indicating that this area might provide suitable, albeit low quality habitat for the Texas ayenia. However, no Texas ayenia were observed during the February 2010 survey.

***South Texas Ambrosia***

The South Texas ambrosia (*Ambrosia cheiranthifolia*) is a federally and state-listed endangered species in Cameron County (TPWD 2010a). This species occupies grasslands and mesquite-dominated shrublands on various soils ranging from heavy clays to lighter textured sandy loams, and it is commonly found on coastal prairie communities on the Beaumont Formation (NatureServe 2009). The South Texas ambrosia is also known to inhabit modified, unplowed sites, including railroad and highway ROWs, cemeteries, mowed fields, and erosional areas along small creeks. The only currently known populations are in Nueces and Kleburg counties, Texas. Kleburg County, the nearest of these two counties to the ACS project area, is located approximately 80 miles to the north.

### 5.2.2 *Effects of the Proposed Project on Federally Listed Species*

The project area has been significantly disturbed in the past due to cultivation and regular levee ROW maintenance activities. There is no designated or proposed critical habitat in the project area. Potential habitat exists within the project area for six federally listed species. Under the Preferred Alternative, levee construction activities would remove primarily low quality

herbaceous non-native grassland communities along the levee slopes, as well as some areas of agricultural land, rangeland, old-field communities, woodlands/thornbrush, and riparian habitat associated with irrigation canals and the drainage ditches. Higher quality habitat associated with the de facto wildlife travel corridor would be avoided to the greatest extent practical. Based on the marginal habitat impacted and the degree and frequency of disturbances along the ACS, it is determined that the Preferred Alternative is not likely to adversely affect piping plover, northern aplomado falcon, jaguarondi, ocelot, Texas ayenia, and south Texas ambrosia. There would be no effect on species with no habitat present within the project area (e.g., marine species). A qualified environmental monitor would be provided to survey for federally listed T&E species to ensure the prevention of impact on any federally listed species.

The following detailed species descriptions outline potential impacts associated with the ACS rehabilitation project Preferred Alternative to federally listed species potentially present in the project area.

***Piping Plover***

It is possible that the piping plover may occur within or fly through the project area as a rare migrant. However, no suitable foraging or nesting habitat is present for this species. Any construction activities would impact previously disturbed areas within the USIBWC's existing ROWs. Construction activities would result in temporary vegetation removal within herbaceous non-native grassland communities along the levee slopes, as well as some areas of agricultural land, rangeland, old-field communities, woodlands/thornbrush (including the LRGNWR tract near levee mile 13), and riparian habitat associated with the irrigation canals, drainage ditches, and the de facto wildlife travel corridor. Following revegetation after construction, conditions along the levee slopes would be similar to those before construction. Due to the lack of suitable habitat, the temporary nature of impacts and the unlikely occurrence of the piping plover in the project area, the Preferred Alternative is not likely to adversely affect this species.

***Northern Aplomado Falcon***

Construction activities would impact previously disturbed areas within the USIBWC's existing ROWs. The Preferred Alternative includes construction activities within limited areas and, therefore, would not impact highly mobile species with large home ranges such as the northern aplomado falcon. It is anticipated that the birds would move to other hunting grounds during construction activities. Construction activities would result in temporary vegetation removal within herbaceous non-native grassland communities along the levee slopes, as well as some areas of agricultural land, rangeland, old-field communities, woodlands/thornbrush (including the LRGNWR tract near levee mile 13), and riparian habitat associated with the irrigation canals, drainage ditches, and the de facto wildlife travel corridor. Following revegetation after construction, conditions along the levee slopes would be similar to those before construction. Due to the marginal habitat within the project area and the temporary nature of impacts, the Preferred Alternative is not likely to adversely affect this species.

***Jaguarundi***

Construction activities would impact previously disturbed areas within the USIBWC's existing ROWs. Construction activities would result in temporary vegetation removal within herbaceous non-native grassland communities along the levee slopes, as well as some areas of agricultural land, rangeland, old-field communities, woodlands/thornbrush (including the LRGNWR tract near levee mile 13), and riparian habitat associated with the irrigation canals, drainage ditches, and the de facto wildlife travel corridor. No dense woodlands/thornbrush would be removed. Following revegetation after construction, conditions along the levee slopes would be similar to those before construction. Due to the lack of suitable habitat and the temporary nature of impacts, the Preferred Alternative is not likely to adversely affect this species.

***Ocelot***

Construction activities would impact previously disturbed areas within the USIBWC's existing ROWs. Construction activities would result in temporary vegetation removal within herbaceous non-native grassland communities along the levee slopes, as well as some areas of agricultural land, rangeland, old-field communities, woodlands/thornbrush (including the LRGNWR tract near levee mile 13), and riparian habitat associated with the irrigation canals, drainage ditches, and the de facto wildlife travel corridor. No dense shrubland would be removed. Following revegetation after construction, conditions along the levee slopes would be similar to those before construction. Due to the lack of suitable habitat and the temporary nature of impacts, the Preferred Alternative is not likely to adversely affect this species.

***Texas Ayenia***

Construction activities would impact previously disturbed areas within the USIBWC's existing ROWs. Construction activities are not anticipated to occur in high quality wooded habitat for this species; the areas of impact within the woodland/thornbrush communities are relatively similar in composition to adjacent low quality habitat of the levee slopes. Construction activities would result in temporary vegetation removal within herbaceous non-native grassland communities along the levee slopes, as well as some areas of agricultural land, rangeland, old-field communities, woodlands/thornbrush (including the LRGNWR tract near levee mile 13), and riparian habitat associated with the irrigation canals, drainage ditches, and the de facto wildlife travel corridor. Following revegetation after construction, conditions along the levee slopes would be similar to those before construction. Due to the lack of disturbance of suitable habitat and the temporary nature of the potential impacts, the Preferred Alternative is not likely to adversely affect this species.

***South Texas Ambrosia***

Construction activities would impact previously disturbed areas within the USIBWC's existing ROWs. Construction activities would result in temporary vegetation removal within herbaceous non-native grassland communities along the levee slopes, as well as some areas of agricultural land, rangeland, old-field communities, woodlands/thornbrush (including the LRGNWR tract near levee mile 13), and riparian habitat associated with the irrigation canals, drainage ditches,

and the de facto wildlife travel corridor. Following revegetation after construction, conditions along the levee slopes would be similar to those before construction. Due to the unlikely occurrence of the south Texas ambrosia in the project area, the previously disturbed nature of the project area, and the temporary nature of impacts, the Preferred Alternative is not likely to adversely affect this species.

## 5.3 State-Listed Species

### 5.3.1 *Potentially Impacted State-Listed Species*

Twenty-five of the state-listed T&E species have suitable habitat present within the project area (TPWD 2010a). The Eskimo curlew, Rio Grande silvery minnow, and jaguar are considered extirpated from Texas. No state-listed T&E species were observed during the February 2010 survey conducted by TRC; however, numerous colonies of harvester ants, a primary food source for the state-listed threatened Texas horned lizard, were observed along the ACS during the field survey. Table 2 presents state-listed species potentially found in the project area.

### 5.2.2 *Effects of the Proposed Project on State-Listed Species*

The project area has been significantly disturbed in the past due to cultivation and regular levee ROW maintenance activities. Any construction activities would impact previously disturbed areas within the USIBWC's existing ROWs. Levee expansion activities along the ACS would impact primarily herbaceous plant communities, including non-native grasslands, agricultural lands, rangelands, and old-field communities, along with areas of woodlands/thornscrub and riparian communities (e.g. drainage ditches and irrigation canals). A qualified environmental monitor would be provided to survey for state-listed T&E species to ensure the prevention of direct or indirect take of any state listed species.

## Table 2 – State-Listed Threatened and Endangered Species with Potential to Occur in Hidalgo and Cameron Counties

| Species Common Name | Scientific Name | TPWD[1] | County[2] | Preferred Habitat in South Texas | Suitable Habitat in Project Area? |
|---|---|---|---|---|---|
| **WILDLIFE** | | | | | |
| Black-spotted newt | *Notophtalmus meridionalis* | T | C, H | Inhabits wet and mesic areas such as arroyos, canals, ditches, or shallow depressions; aestivates underground during droughts | Y |
| Mexican treefrog | *Smilisca baudinii* | T | C, H | Occupies savannas and areas with xerophytic vegetation in semiarid regions; often found in the vicinity of ponds, pools, canals, and flooded fields; breeds in ponds | Y |
| Sheep frog | *Hypopachus variolosus* | T | C, H | Inhabits low and moderate elevations in tropical humid forests, as well as disturbed and opened habitats; often found at the margins of ponds and marshes and in underground burrows | Y |
| South Texas siren (large form) | *Siren* sp. 1 | T | C, H | Inhabits wet and mesic areas such as arroyos, canals, ditches, or shallow depressions; aestivates underground during droughts | Y |
| White-lipped frog | *Leptodactylus fragilis* | T | C, H | Inhabits a wide variety of habitats including grasslands, cultivated fields, and roadside ditches; species requirements incompatible with widespread habitat alteration and pesticide use in south Texas | N |
| American peregrine falcon | *Falco peregrinus anatum* | T | C, H | In Texas, low-altitude migrant across state from more northern breeding areas in U.S. and Canada; winters along coast and barrier islands and occupies a wide range of habitats during migration, including urban, concentrations along coast and barrier islands; utilizes stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands | Y |
| Brown pelican | *Pelecanus occidentalis* | E | C | Found largely in coastal and near shore areas, where it roosts and nests on islands and spoil banks | N |
| Cactus ferruginous pygmy-owl | *Glaucidium brasilianum cactorum* | T | C, H | Inhabits riparian trees, brush, palm, and mesquite thickets; roosts in small caves and recesses on slopes of low hills during the day; breeds April to June | Y |
| Common black-hawk | *Buteogallus anthracinus* | T | C, H | Inhabits cottonwood-lined rivers and streams and willow tree groves on the Lower Rio Grande floodplain; formerly bred in south Texas | N |
| Gray hawk | *Asturina nitida* | T | C, H | Found locally and irregularly along the U.S.-Mexico border in mature riparian woodlands and semiarid mesquite and scrub grasslands. Breeding range formerly extended north to southernmost Rio Grande floodplain. | Y |

## Table 2 – State-Listed Threatened and Endangered Species with Potential to Occur in Hidalgo and Cameron Counties (Continued)

| Species Common Name | Scientific Name | TPWD[1] | County[2] | Preferred Habitat in South Texas | Suitable Habitat in Project Area? |
|---|---|---|---|---|---|
| Interior least tern | *Sternula antillarum athalassos* | E | C, H | Nests on ground, typically on sites that are sandy and relatively free of vegetation, such as sand and gravel bars in rivers, as well as beaches, spits, and coastal areas | Y |
| Northern aplomado falcon | *Falco femoralis septentrionalis* | E | C, H | Inhabits open grasslands and savannas containing tall cacti, tree yuccas, and open stands of tall pines and oaks | Y |
| Northern beardless-tyrannulet | *Camptostoma imberbe* | T | C, H | Inhabits mesquite woodlands and frequents cottonwoods, willows, elms, and great leadtrees near the Rio Grande; breeds April to July | Y |
| Piping plover | *Charadrius melodus* | T | C | Wintering migrant along the Texas Gulf coast; found in beaches and bayside mudflats or salt flats | N |
| Reddish egret | *Egretta rufescens* | T | C | Resident of the Texas Gulf coast in brackish marshes, shallow salt ponds, and tidal flats; nests on ground or in trees or bushes on dry coastal islands in brushy thickets of yucca and prickly-pear | N |
| Rose-throated becard | *Pachyramphus aglaiae* | T | C, H | Inhabits riparian trees, woodlands, open forest, scrub, and mangroves; breeds April to July | Y |
| Sooty tern | *Sterna fuscata* | T | C | Does not dive, but catches small fish and squid with bill as it flies or hovers over water; breeds April through July | N |
| Texas Botteri's sparrow | *Aimophila botterii texana* | T | C, H | Inhabits grassland and shortgrass plains with scattered bushes or shrubs, sagebrush, mesquite, or yucca; nests on ground of low clump of grasses | Y |
| Tropical parula | *Parula pitiayumi* | T | C, H | Inhabits dense or open woods, undergrowth, brush, and trees along edges of rivers and resacas; breeds April to July | Y |
| White-faced ibis | *Plegadis chihi* | T | C, H | Prefers freshwater marshes, sloughs, and irrigated rice fields, but will also inhabit brackish and saltwater habitats; nests in marshes, in low trees, on the ground in bulrushes or reeds or on floating mats | N |
| White-tailed hawk | *Buteo albicaudatus* | T | C, H | Often found near coast on prairies, cordgrass flats, and scrub-live oak; further inland, often found on prairies, mesquite and oak savannas, and mixed savanna-chaparral; breeds from March to May | Y |

## Table 2 – State-Listed Threatened and Endangered Species with Potential to Occur in Hidalgo and Cameron Counties (Continued)

| Species Common Name | Scientific Name | TPWD[1] | County[2] | Preferred Habitat in South Texas | Suitable Habitat in Project Area? |
|---|---|---|---|---|---|
| Wood stork | *Mycteria americana* | T | C, H | Forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including saltwater; usually roosts communally in tall snags, sometimes in association with other wading birds; breeds in Mexico and moves into Gulf states in search of mudflats, other wetlands, and even forested areas; formerly nested in Texas | Y |
| Zone-tailed hawk | *Buteo albonotatus* | T | C, H | Found in arid open country, including deciduous or pine-oak woodland, mesa, or mountain country, often near watercourses, wooded canyons, and tree-lined rivers along middle-slopes of desert mountains; nests in various habitats and sites, ranging from small trees in lower desert, giant cottonwoods in riparian areas, to mature conifers in montane regions | N |
| Mexican goby | *Ctenogobius elaytonii* | T | C | Found in southern coastal areas in brackish and freshwater coastal streams | N |
| Opossum pipefish | *Microphis brachyurus* | T | C | Found in southern coastal areas; brooding adults found in fresh or low salinity waters and young move or are carried into more saline waters after birth | N |
| River goby | *Awaous banana* | T | C, H | Found in southern coastal waters with clear water, slow to moderate current, sandy or hard bottom, and little to no vegetation; also enters brackish and ocean waters | N |
| Smalltooth sawfish | *Pristis pectinata* | E | C | Different life history stages have different patterns of habitat use; young found very close to shore in muddy and sandy bottoms, seldom descending to depths greater than 32 feet (10 meters); found in sheltered bays, on shallow banks, and in estuaries or river mouths | N |
| Coues' rice rat | *Oryzomys couesi* | T | C, H | Inhabits cattail-bulrush marshes with shade trees and a shallower zone of aquatic grasses near the shoreline; prefers salt and freshwater, as well as grassy areas near water; breeds April to August. | Y |
| Southern yellow bat | *Lasiurus ega* | T | C, H | Associated with trees which provide daytime roosts, including palm trees (*Sabal mexicana*) in Brownsville,; breeds in late winter | N |
| Jaguarundi | *Herpailurus yaguarondi* | E | C, H | Inhabits thick, dense, thorny brush and shrubland | Y |
| Ocelot | *Leopardus pardalis* | E | C, H | Inhabits thick, dense, thorny brush and shrubland | Y |
| West Indian manatee | *Trichechus manatus* | E | C | Found in Gulf and bay system; opportunistic, aquatic herbivore | N |

## Table 2 – State-Listed Threatened and Endangered Species with Potential to Occur in Hidalgo and Cameron Counties (Continued)

| Species Common Name | Scientific Name | TPWD[1] | County[2] | Preferred Habitat in South Texas | Suitable Habitat in Project Area? |
|---|---|---|---|---|---|
| White-nosed coati | *Nasua narica* | T | C, H | Inhabits woodlands, riparian corridors, and canyons; most individuals in Texas are probably transients from Mexico; diurnal, crepuscular, and very sociable; omnivore forages on ground and in trees | N |
| False spike mussel | *Quadrula mitchelli* | T | C, H | Found in substrates of cobble and mud, with water lilies present; Rio Grande, Brazos, Colorado, and Guadalupe (historic) river basins | N |
| Mexican fawnsfoot mussel | *Truncilla cognata* | T | C, H | Habitat preference largely unknown; possibly intolerant of impoundment; possibly needs flowing streams and rivers with sand or gravel bottoms based on related species needed. Rio Grande basin | N |
| Salina mucket | *Potamilus metnecktayi* | T | C, H | Lotic waters in submerged soft sediment (clay or silt) along river banks; other habitat requirements are poorly understood; Rio Grande basin | N |
| Texas hornshell | *Popenaias popeii* | T | C, H | Both ends of narrow shallow runs over bedrock in areas where small-grained materials collect in crevices, along river banks, and at the base of boulders; not known from impoundments; Rio Grande basin in the U.S. | N |
| Green sea turtle | *Chelonia mydas* | T | C | Found in Gulf and bay system, in shallow water seagrass beds, open water between feeding and nesting areas, and barrier island beaches; adults feed on seagrass and seaweed; juveniles are omnivorous and feed on marine invertebrates, then increasingly on seagrass and seaweed; nesting behavior from March to October, with peaks in May and June | N |
| Hawksbill sea turtle | *Eretmochelys imbricate* | E | C | Warm, shallow waters in the Gulf and bay system, especially in rocky marine environments such as coral reefs and jetties' juveniles found in floating mats of sea plants; feed on sponges, jellyfish, sea urchins, mollusks, and crustaceans; nests April through November | N |
| Kemp's ridley sea turtle | *Lepidochelys kempii* | E | C | Gulf and bay system; adults found within shallow waters of Gulf of Mexico, feed primarily on crabs and also on snails, clams, other crustaceans and plants; juveniles feed on sargassum and associated fauna; nests April through August | N |
| Leatherback sea turtle | *Dermochelys coriacea* | E | C | Found in Gulf and bay system; widest ranging open water reptile; omnivorous, with preference for jellyfish; nests from March to August within U.S. range | N |
| Loggerhead sea turtle | *Caretta caretta* | E | C | Juveniles mostly found in Gulf and bay systems; adults are most pelagic of sea turtles; omnivorous, with preference for mollusks, crustaceans, and coral; nests April through November | N |

## Table 2 – State-Listed Threatened and Endangered Species with Potential to Occur in Hidalgo and Cameron Counties (Continued)

| Species Common Name | Scientific Name | TPWD[1] | County[2] | Preferred Habitat in South Texas | Suitable Habitat in Project Area? |
|---|---|---|---|---|---|
| Black-striped snake | *Coniophanes imperialis* | T | C, H | Inhabits semi-arid coastal plains in warm, moist micro-habitats and sandy soils; proficient burrower; lays eggs April to June | Y |
| Indigo snake | *Drymarchon corais* | T | C, H | Inhabits thornbrush-chaparral woodlands of south Texas, in particularly dense riparian corridors; can inhabit suburban and irrigated croplands; requires moist micro-habitats such as rodent burrows for shelter | Y |
| Northern cat-eyed snake | *Leptodeira septentrionalis septentrionalis* | T | C, H | Found in the Gulf coastal plains in thornbrush woodlands and dense thickets bordering ponds and streams; semi-arboreal and nocturnal | Y |
| Reticulate collared lizard | *Crotaphytus reticulatus* | T | H | Occurs in open brush and grasslands with thorn scrub vegetation | Y |
| Speckled racer | *Drymobius margaritiferus* | T | C, H | Occupies dense thickets near water, Texas palm groves, riparian woodlands, and often in areas with much vegetation litter on ground; breeds April to August | N |
| Texas horned lizard | *Phrynosoma cornutum* | T | C, H | Inhabits open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or shrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March to September | Y |
| Texas scarlet snake | *Cemophora coccinea lineri* | T | C | Occupies mixed hardwood shrub on sandy soils; feeds on reptile eggs; semi-fossorial; active April to September | N |
| Texas tortoise | *Gopherus berlandieri* | T | C, H | Inhabits open brush with a preferred grass understory; areas with open grass and bare ground are avoided; occupies shallow depressions and sometimes underground burrows or under objects when inactive; active March to November; breeds April to November | Y |

## Table 2 – State-Listed Threatened and Endangered Species with Potential to Occur in Hidalgo and Cameron Counties (Continued)

| Species Common Name | Scientific Name | TPWD[1] | County[2] | Preferred Habitat in South Texas | Suitable Habitat in Project Area? |
|---|---|---|---|---|---|
| **PLANTS** | | | | | |
| South Texas ambrosia | *Ambrosia cheiranthifolia* | E | C | Occurs at low elevations in open clay-loam to sandy-loam prairies and savannas; only known from Kleburg and Nueces Counties, Texas | N |
| Star cactus | *Astrophytum asterias* | E | C, H | Occurs in sparsely vegetated areas with gravelly, saline clays or loams at low elevations in the Rio Grande Plains; known populations in Starr County, Texas | N |
| Texas ayenia | *Ayenia limitaris* | E | C, H | Occurs at low elevations in dense subtropical woodland communities; prefers well drained, heavy soils on riparian terraces with close to 95 percent canopy cover | Y |
| Walker's manioc | *Manihot walkerae* | E | C, H | Species typically occurs on periphery of native brush in sandy loam underlain by caliche; flowers April to September | N |

[1] - TPWD: E = endangered, T= threatened

[2] - C = Cameron County, H = Hidalgo County

Source: TPWD 2010a

## SECTION 5.4 Migratory Birds

The United States has recognized the critical importance of migratory birds by ratifying international, bilateral conventions for their conservation. Through the Migratory Bird Treaty Act (MBTA), the United States has implemented these migratory bird conventions with the respect to the United States. Executive Order 13186: Responsibilities of Federal Agencies to Protect Migratory Birds directs executive departments and agencies to take certain actions to further implement the MBTA.

The LRGV is a unique and important area for many different types of migratory birds. The habitat diversity resulting from the union of several different climate types (i.e., temperate, desert, coastal, and sub-tropical) supports approximately 484 species of birds, including neotropical migrants, shorebirds, raptors, and waterfowl. Many of these birds migrate along the Central and Mississippi flyways, which converge in this region of South Texas. Migratory birds that nest in this area usually do so from March through August.

The results of the February 2010 field surveys conducted by TRC indicated that primarily herbaceous plant communities, including non-native grasslands, agricultural lands, rangelands, and old-field communities, would be impacted from the Preferred Alternative, along with areas of woodlands/thornscrub and drainage ditches (i.e., riparian communities). All construction activities would impact previously disturbed areas within the USIBWC's existing ROWs. The Preferred Alternative would remove up to 147 acres of non-native herbaceous vegetation on the existing levee slopes, approximately 28 acres of agricultural land, 34 acres of rangeland, 0.8 acre of old-field, 14.7 acres of woodland/thornscrub (including the USFWS LRGNWR tract near levee mile 13), 2 acres of borrow pits, and 2.6 acres of riparian (including the drainage ditches [0.8-acre], irrigation canals [0.2-acre], and the de facto wildlife travel corridor [8.3 acres]) communities adjacent to the levee. The removal of trees and clearing of the ROW either would be conducted outside of the breeding season of the bird species in this area (March through August) or the ROW would be surveyed for active nests to ensure the preservation of the nests.

## SECTION 6.0 References


Blair, W.F. (1950). The Biotic Provinces of Texas. *Texas Journal of Science*, 2, 93 – 117.

Correll, D.S. & Johnston, M.C. (1979). *Manual of the Vascular Plants of Texas.* Dallas, TX: The University of Texas at Dallas.

Crosswhite, F.S. (1980). Dry Country Plants of the South Texas Plains. *Desert Plants*, 2(3), 141-179.

Diamond, D.D. (1993). *Classification of the plant communities of Texas.* Series level. Unpublished manuscript, Texas Natural Heritage Program.

Judd, F.W. (2002). Tamaulipan Biotic Province. In J.W. Tunnell, Jr. & Frank W. Judd (Eds.), *The Laguna Madre of Texas and Tamaulipas* (pp. 38 – 58). College Station, TX: Texas A&M University Press.

NatureServe. (2009). *NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1.* Retrieved February 10, 2010 from, NatureServe website: http://www.natureserve.org/explorer.

Taylor, R.B., J. Rutledge, and J.G. Herrera. (1994). *A Field Guide to Common South Texas Shrubs*. Austin, TX: Texas Parks and Wildlife Press.

Texas Parks and Wildlife Department. (2010a). *Annotated County Lists of Rare Species for Cameron and Hidalgo Counties.* Retrieved February 10, 2010, from http://gis.tpwd.state.tx.us/TpwEndangeredSpecies/DesktopDefault.aspx.

Texas Parks and Wildlife Department. (2010b). *Texas Ayenia, Wildlife Fact Sheet.* Retrieved February 10, 2010, from http://www.tpwd.state.tx.us/huntwild/wild/species/ayenia.

U.S. Army Corps of Engineers. (2008). *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region*. Vicksburg, MS: Wakeley, J.S., Lichvar, R.W., & Noble, C.V. (Eds.).

U.S. Army Corps of Engineers. (1987). *Corps of Engineers Wetlands Delineation Manual.* Technical Report Y-87-1. Vicksburg, MS: Environmental Laboratory.

U.S. International Boundary and Water Commission. (2008). *Final Programmatic Environmental Impact Statement, Improvements to the USIBWC Rio Grande Flood Control Projects along the Texas-Mexico Border.* Austin, TX: Parsons Corporation.

U.S. Fish and Wildlife Service. (2010). *Endangered and Threatened Wildlife and Plants*. 50 CFR 17.11 and 17.12. Retrieved February 10, 2010 from http://www.access.gpo.gov/nara/cfr/waisidx_01/50cfr17_01.html

U.S. Fish and Wildlife Service. (2003). *Amended Biological Opinion.* (Consultation No. 2-11-91-F-144, May 23, 2003). Corpus Christi, TX: Strand, A.M.

U.S. Fish and Wildlife Service. (1990). *Northern Aplomado Falcon Recovery Plan*. Albuquerque, NM: Hector, D.P.K.

# APPENDIX C:
# Waters of the United States Delineation Report

# WATERS OF THE UNITED STATES DELINEATION REPORT

**ARROYO COLORADO SOUTH LEVEE**
**LEVEE REHABILITATION PROJECT**

*Lead Agency:*

**United States Section,**
**International Boundary and Water Commission**
El Paso, Texas

**March 22, 2010**

TRC

# WATERS OF THE UNITED STATES DELINEATION REPORT

**ARROYO COLORADO SOUTH LEVEE**
**LEVEE REHABILITATION PROJECT**

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**March 22, 2010**

## Table of Contents

**Page**

Table of Contents ..... ii
List of Figures ..... ii
List of Appendices ..... ii
1.0 Introduction ..... 1
2.0 Proposed Project ..... 1
2.1 Location ..... 1
2.2 Purpose and Description ..... 1
3.0 Methods ..... 1
3.1 Background Data Review ..... 2
3.2 Field Investigation ..... 2
3.2.1 Hydrophytic Vegetation ..... 3
3.2.2 Hydric Soils ..... 4
3.2.3 Wetland Hydrology ..... 4
3.3 Reporting ..... 5
4.0 RESULTS ..... 5
4.1 Background Data Review ..... 5
4.2 Field Investigation ..... 5
4.2.1 Vegetation ..... 5
4.2.2 Soils ..... 7
4.2.3 Hydrology ..... 10
5.0 SUMMARY ..... 10
6.0 REFERENCES ..... 11

## List of Figures

Figure 1 Topographic Map
Figures 2 - 8 National Wetland Inventory and Soils Maps with Survey Results

## List of Appendices

Appendix A Survey Results - Included for Each Wetland Determination Data Point

# ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| ACF | Arroyo Colorado Floodway |
| ACSL | Arroyo Colorado South Levee |
| CBD | Cannot Be Determined |
| EPA | Environmental Protection Agency |
| FAC | Facultative |
| FACU | Facultative Upland |
| FACW | Facultative Wetland |
| FEMA | Federal Emergency Management Agency |
| GPS | Global Positioning System |
| HA | Harlingen Clay |
| HGB | Hidalgo Find Sandy Loam (1 – 3% slopes) |
| JD | Jurisdictional Determination |
| LAA | Laredo Silty Clay Loam |
| LRGFCP | Lower Rio Grande Flood Control Project |
| MEA | Mercedes Clay (0 – 1% slopes) |
| MGC | Mercedes Clay (loamy substratum; 0 – 5 % slopes) |
| NI | No Indicator |
| OBL | Obligate Wetland |
| OM | Olmito Silty Clay |
| Project | Lower Rio Grande Flood Control Project |
| PS | Pump Station |
| RR | Rio Grande Silt Loam |
| TRC | TRC Environmental Corporation |
| UPL | Obligate Upland |
| U.S. | United States |
| USIBWC | United States Section of the International Boundary and Water Commission |
| USACE | United States Army Corps of Engineers |
| USDA − NRCS | United States Department of Agriculture − Natural Resource Conservation Service |
| USGS | United States Geological Survey |
| UTM | Universal Transverse Mercator |

# 1.0 INTRODUCTION

TRC Environmental Corporation (TRC) has been contracted by the United States Section of the International Boundary and Water Commission (USIBWC) to conduct natural resource surveys and prepare an Environmental Assessment for the proposed Arroyo Colorado South Levee Rehabilitation Project (Project) for flood control improvements along the Arroyo Colorado Floodway (ACF) located in Hidalgo and Cameron Counties, Texas. The USIBWC is proposing to raise the levee by adding fill material to the existing levee to bring flood control.

Pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act, TRC conducted a survey of wetlands, waterbodies, and other special aquatic sites for the properties proposed for the Project. This jurisdictional delineation report describes the results of delineation of jurisdictional Waters of the United States (U.S.) conducted in February 2010 for approximately 16 miles of existing levee right-of-way for the Project.

# 2.0 PROPOSED PROJECT

The ACF is a component of the Lower Rio Grande Flood Control Project (LRGFCP; Project) that conveys floodwater diverted from the Rio Grande to the Laguna Madre in the Gulf of Mexico and protects urban, suburban, and highly developed irrigated farmland along the Rio Grande delta in the United States and Mexico. The Project involves improvements to the Arroyo Colorado South Levee system (ACSL) in order to address the 100-year flood protection criteria established by the Federal Emergency Management Agency (FEMA). Improvements to the ACSL include raising the levee by adding fill material to the existing levee to bring flood control to the original design specifications with a minimum of 3-feet of freeboard.

## 2.1 Location

The ACSL Project is located along the Arroyo Colorado South Levee from FM 1015 to Parker Road in Hidalgo and Cameron Counties, Texas (survey area). Where accessible, the survey area extended approximately 25 feet laterally beyond the toe of the levee on both sides for the entire 16 miles of ACSL right-of-way, which is regularly maintained by the USIBWC. A site location map is included as Figure 1.

## 2.2 Purpose and Description

The purpose of the Proposed Action is to improve the ACSL in order to address the 100-year flood protection criteria established by FEMA. Improvements to the ACSL are needed to retain FEMA levee system certification, as areas currently protected by the ACSL were identified by FEMA to be insufficiently protected.

# 3.0 METHODS

The wetland determination and delineation was performed using the routine on-site determination methods described in the Corps of Engineers Wetlands Delineation Manual (U.S. Army Corps of Engineers [USACE], Environmental Laboratory 1987), hereafter referred to as the "1987 Manual," and is consistent with the methods, guidelines, and indicators present in the Interim Regional Supplement to the Corps of Engineers Wetland Delineation manual: Atlantic and Gulf Coastal Plain Region ([Regional Supplement] USACE 2008, USACE 2009). Wetlands

were classified by type and other jurisdictional systems (*i.e*, rivers, streams, aquatic systems) were characterized in accordance with the Cowardin classification system detailed in the Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et.al. 1979). The determination and delineation consisted of: (1) background data collection and assessment; (2) field investigation; and (3) reporting.

## 3.1 Background Data Review

Prior to initiation of the routine on-site investigation, existing background data and information were reviewed to provide information regarding the presence of previously identified wetlands, the location of hydric soils, and/or locations where jurisdictional wetlands could exist that have not been previously mapped. The background data reviewed consisted of the following materials:

- U.S. Geological Survey (USGS), 7.5-minute series quadrangle topographical maps, Progreso Quadrangle in Hidalgo County, Texas (USGS 2002);
- USGS, 7.5-minute series quadrangle topographical maps, Mercedes Quadrangle in Hidalgo County, Texas (USGS 2002);
- USGS, 7.5-minute series quadrangle topographical maps, La Feria Quadrangle in Hidalgo and Cameron Counties, Texas (USGS 2002);
- USGS, 7.5-minute series quadrangle topographical maps, Santa Maria Quadrangle in Hidalgo and Cameron Counties, Texas (USGS 2002);
- USGS, 7.5-minute series quadrangle topographical maps, Harlingen Quadrangle in Cameron County, Texas (USGS 2002);
- U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) Web Wetlands Mapper (USFWS 2010); and
- U.S. Department of Agriculture – Natural Resource Conservation Service (USDA – NRCS) Web Soil Survey Application (USDA – NRCS 2010).

## 3.2 Field Investigation

An on-site determination and delineation of jurisdictional Waters of the U.S. was conducted by qualified wetland scientists within the Project survey area in February 2010.

The Project spatial boundaries were confirmed by aerial photograph interpretation and initial site reconnaissance. The survey area was then examined for the presence of atypical situations via site reconnaissance to identify any recent and sufficient natural or human-induced alteration that may have significantly changed the area vegetation, soils, and/or hydrology.

A site reconnaissance was conducted of all portions of the survey area to identify and develop an approximate location map of each different plant community type present to ensure all plant community types were included in the investigation. Each identified plant community type was further examined to determine the type(s) and number of vegetative layers in each

community, including trees (woody overstory), saplings/shrubs (woody understory), herbs (herbaceous understory), and/or woody vines.

Observation points were established and documented within each vegetative community. The investigators determined whether normal environmental conditions were present at each observation point by considering whether: (a) hydrophytic vegetation and/or hydrologic indicators were lacking due to annual or seasonal fluctuations in precipitation or groundwater levels; and (b) hydrophytic vegetation indicators were lacking due to seasonal fluctuations in temperature.

Data points were recorded using a sub-meter Trimble Global Positioning System (GPS) unit. GPS data were recorded as NAD 1983 UTM coordinates. Soil pit sampling was conducted to determine the presence of hydric soil indicators, with plant communities identified and characterized for hydrophytic properties, indicator status, and percent cover. Particular wetland hydrology indicators were also identified.

Vegetation, soil, and hydrologic information for each sample plot was recorded on data forms and used to determine wetland boundaries. A description of the methods employed to assess each parameter is provided in Sections 3.2.1 to 3.2.3.

### *3.2.1 Hydrophytic Vegetation*

According to the 1987 Manual, hydrophytic vegetation is defined as, "the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present." Plant species are further categorized according to their probability of occurrence in wetlands. Each plant species is assigned an "Indicator Status," which ranges from Obligate Wetland (100% occurrence in wetlands) to Obligate Upland (does not occur in wetlands). Indicator status categories are further defined as follows:

- Obligate Wetland (OBL): A species that almost always (under natural conditions) occurs in wetlands (estimated probability greater than 99%).
- Facultative Wetland (FACW): A species that usually occurs in wetlands (estimated probability 67% - 99%), but occasionally is found in non-wetlands.
- Facultative (FAC): A species that is equally likely to occur in non-wetlands (estimated probability 34% - 66%).
- Facultative Upland (FACU): A species that usually occurs in non-wetlands (estimated probability 67% - 99%), but is occasionally found in wetlands.
- Obligate Upland (UPL): A species that almost always (under natural conditions) occurs in non-wetlands (estimated probability greater than 99%).
- No Indicator (NI): A species for which there is insufficient information to determine an indicator status ranking.

- Cannot Be Determined (CBD): A species that was only identified to the genus level. Therefore, no indicator could be assigned.

All plant communities investigated were characterized by identifying dominant plant species using the dominance test. For each stratum in the plant community (tree, sapling, shrub, herb, and woody vine), a list of plant species (Reed 1988) and their respective percent cover was recorded. Percent cover for each plant species was recorded within a 30-foot radius around a central observation point for the tree and woody vine strata and a 5-foot radius for the sapling, shrub, and herbaceous strata; the size of the sampling plots for percent cover were modified from the 30-foot radius for all strata, as recommended in the Regional Supplement, due to the relatively small extent of the potential wetlands (i.e. borrow sites) within the Project survey area. The total cover for each stratum may range from zero to over 100 percent, depending on the density and amount of overlapping of vegetation.

"Dominant" plants were classified using the 50/20 rule, under which any plant species that equaled or exceeded 50 percent of the total percent aerial coverage for each stratum, and any additional species comprising 20 percent or more of the same stratum, was classified as a dominant plant.

Vegetation was reevaluated using the prevalence index in cases where indicators of hydric soil and wetland hydrology were present, but the percentage of dominant species did not exceed 50 percent utilizing the dominance test. The prevalence index is a weighted-average wetland indicator status of all plant species in the sampling plot, where each indicator status category is given a numeric code and the abundance as evaluated by percent cover is weighted. A site scoring less than 3 on the prevalence index meets the wetland hydrophytic vegetation criterion. The prevalence index is used in the Atlantic and Gulf Coastal Plain Region Supplement to determine whether hydrophytic vegetation is present on sites where indicators of hydric soil and wetland hydrology are present but the vegetation initially fails the dominance test.

### *3.2.2 Hydric Soils*

According to the 1987 Manual, a hydric soil is defined as "a soil that is saturated, flooded or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation." The presence or absence of hydric soils was determined by pit sampling to a depth of twelve inches or more, and characterization of soil profile layers using Munsell soil color charts (X-Rite Incorporated 2000). The presence of hydric indicators was recorded, including, but not limited to, saturation, gleying, mottling, depleted matrix, and development of other redoximorphic features. The wetland boundary was placed between areas meeting the three wetland criteria and areas which do not meet the criteria. As a result, soil in both the assumed wetland and the surrounding upland were sampled to verify the wetland boundary.

### *3.2.3 Wetland Hydrology*

Guidance in the 1987 Manual indicates that wetland hydrology is found in areas in which "the presence of water has an overriding influence on characteristics of vegetation and soils due to anaerobic and reducing conditions, respectively." The frequency of soil inundation or saturation is dependent on a variety of factors, including topography, soil stratigraphy and soil

permeability, in conjunction with the water source(s) of precipitation, runoff, stormwater, and groundwater discharge. Wetland hydrology is classified according to the extent of soil saturation or inundation and ranges from permanently inundated to irregularly inundated or saturated. Those areas which are either intermittently or never inundated or saturated are not considered to have wetland hydrology.

Indicators of wetland hydrology include, but are not limited to, drainage patterns, drift lines, water marks, sediment and debris deposition, and visual observations and historical records. Wetland hydrology indicators were noted during the investigation.

### 3.3 Reporting

Data collected in the field was subsequently entered onto the data forms presented in Appendix A. Wetland delineation/GPS data were collected and recorded as NAD 1983 UTM coordinates. Photographs were also taken of the Project site and at data collection points. All survey results are presented in Appendix A.

## 4.0 RESULTS

### 4.1 Background Data Review

Desktop analysis of potential Waters of the U.S. was conducted by reviewing topographic (Figures 1), and USFWS NWI (2010) online wetland mapper and hydric soils data from the USDA − NRCS (2010) online web soil survey data (Figures 2 though 8). This analysis provided an indication of the presence of wetlands and waterbodies, areas and soils likely to support hydrophytic vegetation, and photographic signatures of potential wetlands and waterbodies. It should be noted that the status of the wetlands presented on the NWI online mapper that were outside of the survey corridor could not be verified.

### 4.2 Field Investigation

Maps, data forms, photographs, and the documentation of the presence or absence of wetland vegetation, hydric soils, wetland hydrology, and waterbodies are provided in Appendix A.

#### *4.2.1 Vegetation*

**Wetland/Riparian Plant Communities**

Wetland and riparian plant communities within the survey area consist of a mixture of emergent depressional wetland (i.e., former levee borrow site) and riparian (i.e., agricultural drainage ditches/canals) communities.

The emergent depressional wetland (Wetland A; Figure 9) was dominated by pale spikerush (*Eleocharis macrostachya*) with additional hydrophytic vegetation including retama (*Parkinsonia aculeata*) and dock (*Rumex* sp.). Fringe vegetation included Lindheimer's bladderpod (*Lesquerella lindheimeri*), sea oxeye daisy (*Borrichia frutescens*), retama, huisache (*Acacia farnesiana*), dock, and sand dropseed (*Sporobolus cryptandrus*). According to the Cowardin wetland classification system, this wetland

would be best described as palustrine, emergent, persistent, temporarily flooded, and excavated (PEM1Ax).

Riparian vegetation within the survey area is primarily associated with intermittent agricultural drainage ditches and includes native and non-native woody and herbaceous vegetation. Growth of woody vegetation in some areas is relatively young due to routine maintenance or agricultural activities. Areas with more infrequent maintenance, including ditches with very steep slopes, support larger trees and denser vegetation. Common riparian species include black willow (*Salix nigra*), retama, huisache, honey mesquite (*Prosopis glandulosa*), sugarberry (*Celtis laevigata*), Texas ebony (*Pithecellobium flexicaule*), common reed (*Phragmites australis*), southern cattail (*Typha domingensis*), sea oxeye daisy (*Borrichia frutescens*), greenbriers (*Smilax* sp.), balloon vine (*Cardiospermum halicacabum*), pale spikerush (*Eleocharis macrostachya*), King Ranch bluestem, and buffelgrass. Areas of drainage ditches that exhibit a stronger upland vegetation component support species including lotebush, granjeno (*Celtis ehrenbergiana*), and Texas pricklypear (*Opuntia engelmannii* var. *lindheimeri*). Many of the agricultural drainage ditches have moderate to severe erosion, with some slopes supporting little to no vegetation. Most drainage ditch slopes are relatively steep, limiting the lateral extent of riparian vegetation along the ditches. Three of the drainage ditches contain open, deepwater habitat (*i.e.*, presented as impounded waterbodies on the NWI online mapper; Figures 3 - 4).

The vegetation communities within the drainage ditches that are adjacent and parallel to the south levee typically reflect those of the surrounding areas, with some localized areas of hydrophytic vegetation within the channel, including young black willow, cattails and common reeds. Some areas of the drainage ditches contain primarily upland vegetation communities with vegetation such as buffelgrass, King Ranch bluestem, honey mesquite, lotebush, Texas pricklypear, granjeno, and Spanish dagger.

**Upland Plant Communities**

Upland plant communities within the survey area consist of a mixture of brushland and herbaceous (including old-field and maintained levee slopes) communities, each of which influences a distinct collection of upland plant communities. Additionally, several former levee borrow sites that support hydrophytic vegetation were identified along the ACSL; observed soil in excavated pits within these non-wetland borrow sites did not exhibit hydric properties (see data sheets). Much of the survey area and surrounding region consists of agricultural land (including rangeland, pasture, and cropland).

Common species identified for the brushland communities included honey mesquite, huisache, retama, Texas ebony (*Pithecellobium flexicaule*), granjeno (*Celtis ehrenbergiana*), coyotillo (*Karwinskia humboldtiana*), coma (*Sideroxylon celastrinum*), snake eyes (*Phaulothamnus spinescens*), desert yaupon (*Schaefferia cuneifolia*), lotebush (*Ziziphus obtusifolia*), goatbush (*Castela erecta* var. *texana*), Spanish dagger (*Yucca*

*treculeana*), Texas pricklypear (*Opuntia engelmannii* var. *lindheimeri*), tasajillo (*Cylindropuntia leptocaulis*), snailseed (*Cocculus diversifolius*), blood sage (*Salvia coccinea*), buffelgrass (*Pennisetum ciliare*), and King Ranch bluestem (*Bothriochloa ischaemum*).

Common species identified for the herbaceous communities included King Ranch bluestem, buffelgrass, sand dropseed, Bermudagrass (*Cynodon dactylon*), cane bluestem (*Bothriochloa barbinodis*), common sunflower (*Helianthus annuus*), silverleaf nightshade (*Solanum elaeagnifolium*), Virginia plantain (*Plantago virginica*), Virginia pepperweed (*Lepidium virginicum*), sandmat (*Chamaesyce* sp.), Carolina wolfberry (*Lycium carolinianum* var. *quadrifidum*), sea oxeye daisy, Texas varilla (*Varilla texana*), Rio Grande beebrush (*Aloysia macrostachya*), Lindheimer's bladderpod, and balloon vine (*Cardiospermum halicacabum*). Areas of levee slopes that are infrequently maintained support young, woody vegetation including honey mesquite, retama, and lotebush.

Common species identified for the upland borrow sites included pale spikerush, common frogfruit (*Phyla nodiflora* var. *reptans*), bigfoot waterclover (*Marsilea macropoda*), upright burhead (*Echinodorus berteroi*), dock, and retama. Fringe vegetation included sea oxeye daisy, Carolina wolfberry, Lindheimer bladderpod, sand dropseed, flatsedge (*Cyperus* sp.), retama, honey mesquite, and huisache.

The predominant agricultural land use in the region is irrigated and non-irrigated cropland. Common crops include sorghum grain, cotton, corn, and various vegetables. Many areas are also used as rangeland and pasture. These areas are or were recently used for grazing of livestock, including cattle, goats, and sheep.

### *4.2.2 Soils*

**Hydric Soils**

A review of the NRCS Soil Survey indicates the hydric soils within the survey area are limited in extent and consist of one soil, saline Harlingen clay (HC). This soil is listed by the NRCS as hydric in Cameron County and non-hydric in Hidalgo County. Saline Harlingen clay in Cameron County was not identified near the survey area (Figures 5 through 8). A description of this hydric soil, as provided by the NRCS, is provided below.

<u>Harlingen clay, saline (HC)</u>

The Harlingen series consists of deep, moderately well drained, very slowly permeable soils that formed in thick beds of calcareous, clayey alluvium. Slopes are less than 0.5 percent. The potential for surface runoff is slow. These soils occupy broad areas of ancient stream terraces on delta plains.

Most areas with saline Harlingen clay are used for irrigated pasture. Pasture grasses include Bermudagrass, introduced bluestems, and other grasses. A few areas are used for irrigated crops, primarily cotton. Surface drainage systems remove excess water after heavy precipitation. This soil is moderately saline to strongly saline as a result of over-irrigation and evaporation of slightly saline water. A few areas are idle.

**Non-Hydric Soils**

A review of the NRCS Soil Survey indicates that the non-hydric soils within the survey area include clays, clays with loamy substratum, silty clays, and silt loams that lie on slopes that range from 0 to 5 percent. These soils are moderately well drained to well drained. Permeability ranges from very slow to moderate. Surface runoff is typically slow with some areas exhibiting a high erosion potential caused by rapid surface runoff of steeper slopes. Some areas include former, shallow borrow sites located adjacent to the USIBWC levees. Descriptions of non-hydric soils, as provided by the NRCS, are provided below.

Harlingen clay (HA)

The Harlingen series consists of deep, moderately well drained, very slowly permeable soils that formed in thick beds of calcareous, clayey alluvium. Slopes are less than 0.5 percent. The potential for surface runoff is slow. These soils occupy broad areas of ancient stream terraces on delta plains.

Most areas with Harlingen clay are used for growing crops (irrigated and non-irrigated) such as cotton, grain sorghum, and cool and season vegetables. Surface drainage systems remove excess water after heavy precipitation. Some areas are used as pasture and rangeland. Pasture grasses include Bermudagrass, African stargrass, and introduced bluestems.

Hidalgo fine sandy loam, 1 – 3 percent slopes (HGB)

The Hidalgo series consists of deep, well drained, moderately permeable soils that formed in calcareous loamy and clayey sediments. Slopes range from 0 to 5 percent. The potential for surface runoff is medium. These soils occupy areas of convex uplands.

Most areas with Hidalgo fine sandy loam are used for growing citrus and crops (irrigated and non-irrigated) such as cotton, grain sorghum, and cool and season vegetables. Sub-surface drainage systems remove excess irrigation water. Some areas are used as pasture and rangeland. Pasture grasses include Bermudagrass, African stargrass, and introduced bluestems.

Areas within the Arroyo Colorado floodway that contain Hidalgo fine sandy loam are being used for commercial sand mining (Figure 6).

Laredo silty clay loam (LAA)

The Laredo series consists of deep, well drained, moderately permeable soils that formed in calcareous silty alluvium. Slopes range from 0 to 1 percent. The potential for surface

runoff is slow. This soil occupies areas of old floodplains and deltas. Laredo soils are used for pasture and irrigated and dry-farmed crops, including cotton, grain sorghum, cool-season vegetables, and citrus.

Mercedes clay, 0 – 1 percent slopes (MEA)

The Mercedes series consists of deep, moderately well drained, very slowly permeable, eroded soils that formed in thick beds of calcareous, clayey alluvium.

The Mercedes clay is found in broad areas on old floodplains and deltas and in long, narrow drainageways. Slopes are typically less than 0.5 percent. The potential for surface runoff is slow. Areas with this soil are used for irrigated and dry-farmed crops, including cotton and grain sorghum, and pasture. Pasture grasses include Bermudagrass, African stargrass, and introduced bluestems.

Many areas within the Arroyo Colorado floodway that contain Mercedes clay (MEA) are being used for commercial sand mining (Figure 6).

Mercedes clay (loamy substratum), 1 – 5 percent slopes (MGC)

The Mercedes series consists of deep, moderately well drained, very slowly permeable, eroded soils that formed in thick beds of calcareous, clayey alluvium.

The Mercedes clay (loamy substratum) is found on convex slopes of the Arroyo Colorado. Slopes range from 1 to 5 percent. The potential for surface runoff is rapid. Most areas with this soil are idle with a few areas in pasture. Pasture grasses include Bermudagrass, African stargrass, and introduced bluestems.

Many areas within the Arroyo Colorado floodway that contain Mercedes clay (MGC) are being used for commercial sand mining (Figures 5 and 6).

Olmito silty clay (OM)

The Olmito series consists of deep, moderately well drained, slowly permeable soils that formed in calcareous, clayey alluvium. Slopes are typically less than 0.5 percent. The potential for surface runoff is slow. This soil occupies areas of old floodplains and deltas. Areas with Olmito soil are used for growing irrigated and dry-farmed crops, including cotton, grain sorghum, and cool season vegetables. Surface drainage systems remove excess water after heavy precipitation. Subsurface tile drainage systems lower high water tables from irrigation. Some areas are used for pasture. Pasture grasses include Bermudagrass, African stargrass, introduced bluestems, and other grasses.

Rio Grande silt loam (RR)

The Rio Grande series consists of deep, well drained, moderately permeable soils that formed in calcareous, silty alluvium. This soil is found the floodplain of the Rio Grande. Slopes are less than 1 percent. The potential for surface runoff is slow. Areas with soil are used for irrigated crops, including cotton, grain sorghum, and cool season vegetables, pasture. Pasture grasses include Bermudagrass, African stargrass, and other grasses. Some areas are used for growing citrus.

### *4.2.3 Hydrology*

The survey area is located along the south levee of the Arroyo Colorado and is approximately 3.5 to 8 miles north of the Rio Grande (Figure 1). The entire Project area is located within the South Laguna Madre Watershed (U.S. Environmental Protection Agency [USEPA] 2010).

Hydrology of the survey area is primarily driven by agricultural irrigation runoff/drainage and precipitation events. The general water regime across the entire Project area is to the east. Within the survey area, water locally follows various levee borrow/agricultural drainage ditches adjacent to and paralleling the Arroyo Colorado south levee. The levee borrow/agricultural drainage ditches receive surface and sub-surface water from adjacent agricultural fields as well as surface water from uplands; these ditches also receive surface and sub-surface water from agricultural fields to the south *via* agricultural drainage ditches. Water ultimately flows north across the south levee and into the Arroyo Colorado *via* man-made drainage structures such as flood gates and culverts. Several irrigation canals also cross the Arroyo Colorado floodway along the survey area *via* man-made irrigation structures.

It should be noted that the region has received above-average precipitation prior to the field investigation, as indicated by rainfall totals measured at the Harlingen International Airport (National Weather Service [NWS; 2010]). During the previous six months from September 2009 through February 2010, 15.37 inches of rain fell, which is 1.23 inches above average for the same period of time. Moreover, 2.09 inches of rain fell during February 2010, which is 0.26 inches above average for the month of February at the Harlingen International Airport (NWS 2010). Several of the evaluated borrow sites were significantly inundated as a result of the recent rainfall, potentially making identification of hydric soil indicators problematic. As previously stated, hydric soil was observed in only one of the borrow sites. It is unknown if hydric soil indicators might be observed within some of the other inundated borrow sites during a drier survey period. Conversely, several borrow sites supporting hydrophytic plants contained saturated soils but no inundation; no hydric indicators were observed within these borrow sites. Hydrological conditions of the Project survey area are also detailed on the data forms in Appendix A.

## 5.0 SUMMARY

TRC was contracted by the USIBWC to conduct a delineation of Waters of the U.S. for the proposed Arroyo Colorado South Levee Rehabilitation Project. The delineation was performed by qualified wetland scientists in order to identify the presence and delineate the boundaries of wetlands and other waters potentially subject to regulation by the USACE pursuant to Section 404 of the Clean Water Act. Based on review of background data and field investigations further described in this report, qualified wetland scientists from TRC identified one PEM1Ax wetland (total of 0.09 acres) within the survey area. A map presenting the results of the determination and further details regarding the collected data are presented in Appendix A.

## 6.0 REFERENCES

National Weather Service. 2010. Monthly Weather Summary – Harlingen International Airport. Accessed on March 17 at: http://www.weather.gov/climate/index.php?wfo=bro.

Reed, P. 1988. National List of Plant Species that Occur in Wetlands: Southeast (Region 6). Accessed February 10, 2010 at: http://www.fws.gov/pacific/ecoservices /habcon/pdf/National%20List%20of%20Plant%20Species%201988.pdf.

USACE. 2008. Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region, ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-08-30. U.S. Army Engineer Research and Development Center, Vicksburg, MS.

USACE. 2009. Public Notice: Atlantic and Gulf Coastal Plain Interim Regional Supplement to the 1987 Wetland Delineation Manual. Accessed at: http://www.mvk.usace.army.mil /Offices/od/odf/PubNotice/Charles%20Allred/Special%20Public%20Notice%20(2).pdf.

USACE, Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. U.S. Army Corps of Engineers, Waterways Experiment Station, Wetlands Research Program, Technical Report Y-87-1. Vicksburg, MS. January 1987 - Final Report. 92 pp. + app.

United States Department of Agriculture – Natural Resources Conservation Services (USDA – NRCS). 2010a. National Hydric Soils List by State. Accessed on February 10, 2010 at: http://soils.usda.gov/use/hydric/lists/state.html.

USDA – NRCS. 2010b. Soil Survey Division. Web Soil Survey. Accessed on February 10, 2010 at: http://websoilsurvey.nrcs.usda.gov/app/.

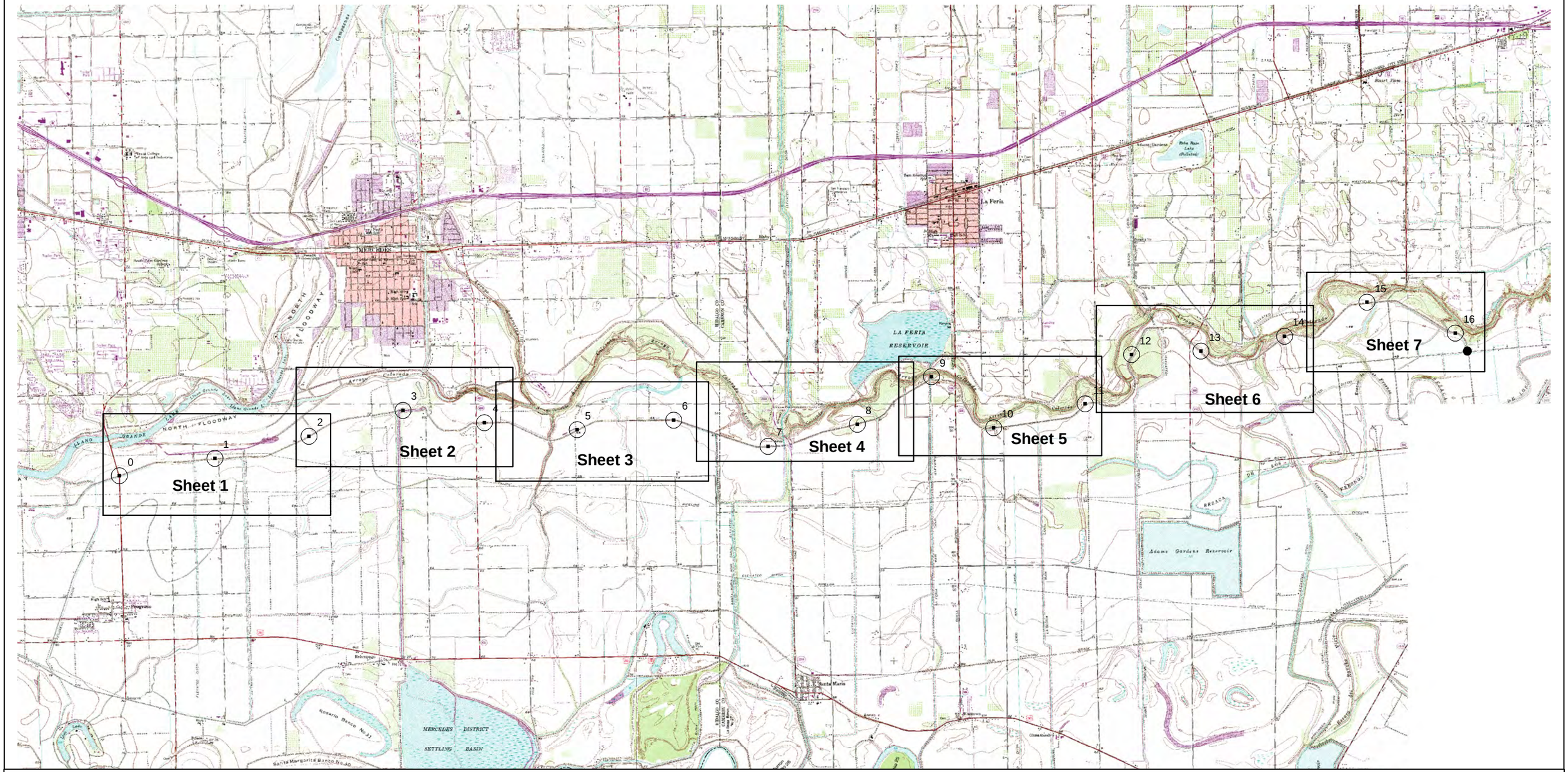
United States Environmental Protection Agency (EPA). 2010. Surf Your Watershed Database. Accessed on February 10, 2010 at: http://cfpub.epa.gov/surf/locate/index.cfm.

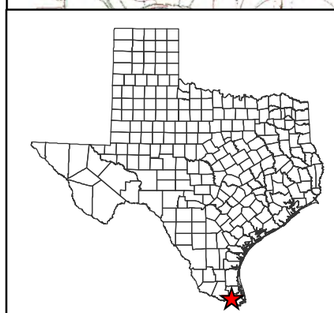
United States Geological Services (USGS). 1990. 7.5-minute series quadrangle topographical maps, Progreso, Mercedes, La Feria, Santa Maria, and Harlingen Quadrangles, Hidalgo and Cameron Counties, Texas.

X-Rite, Incorporated. 2000. Munsell Soil Color Charts. Munsell Color Division, Grand Rapids, MI. Revised Edition.

**FIGURE 1**

**TOPOGRAPHIC MAP**



N

0 1 2 3 Miles

Mile Markers

East End of Levee

**FIGURE 1**
**Site Location Map**

Arroyo Colorado South Levee

Source
USGS Harlingen, La Feria, Mercedes, Progreso and Santa Maria Quadrangles (2002).
Hidalgo and Cameron Counties, Texas

International Boundary and Water Commission
United States Section

# FIGURES 2 - 8

# NATIONAL WETLAND INVENTORY AND SOILS MAPS WITH SURVEY RESULTS

N

0 0.1 0.2 0.3 Miles

Mile Markers
Soil Boundary
Survey Area
Drainage Ditch
Irrigation Canal
Freshwater Emergent Wetland
Freshwater Pond
Lake
Riverine

Source
1. Aerial; National Geospatial Intelligence Agency (2009).
2. Soils; USDA- NRCS SSURGO Database
Hidalgo County, Texas
3. Wetlands; USDOI-USFWS National Wetland Inventory (2010).

**FIGURE 2**
**Soils Map**
**Sheet 1 of 7**

Arroyo Colorado South Levee

International Boundary and Water Commission
United States Section

N

0 0.1 0.2 0.3 Miles

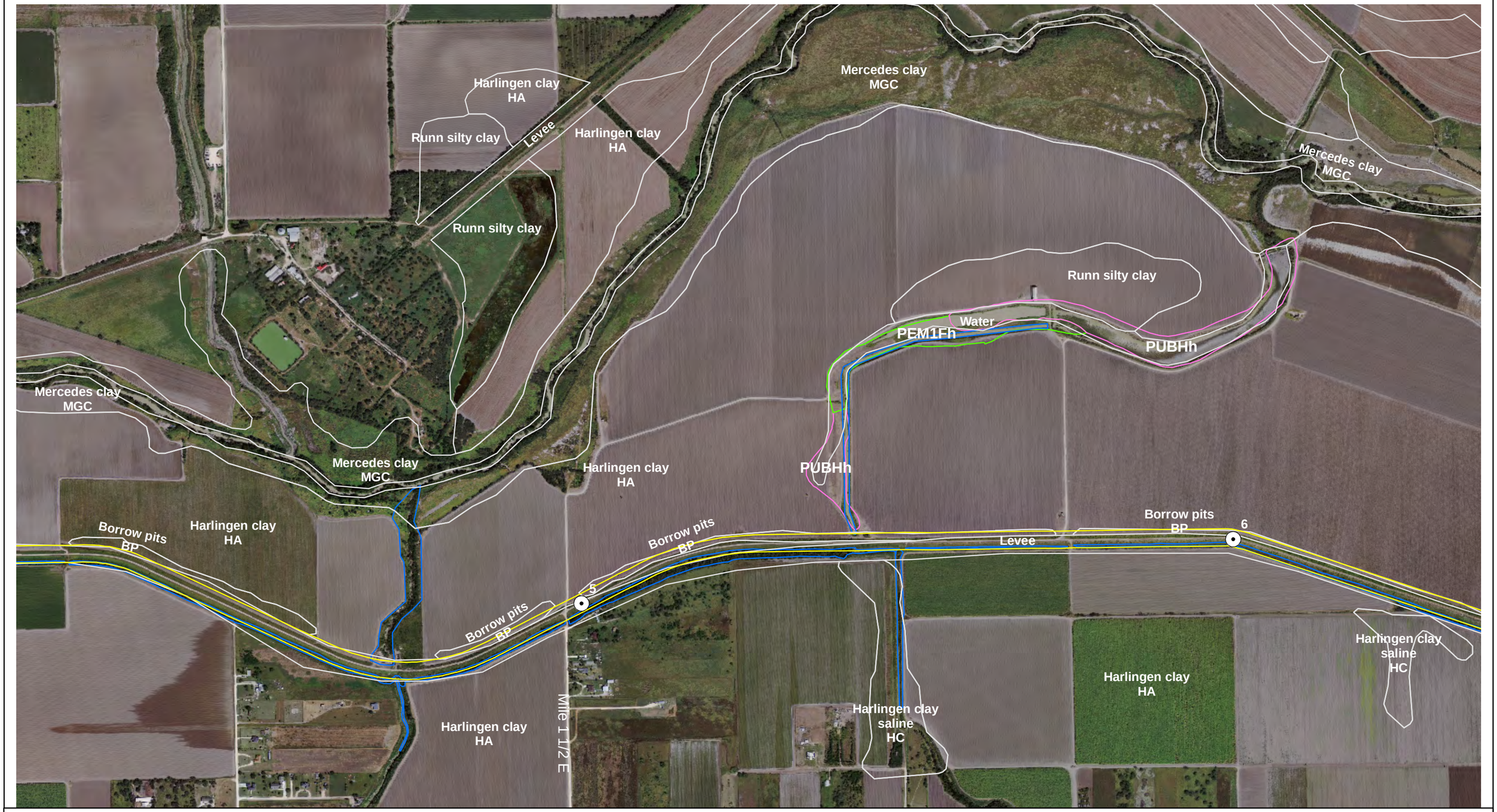
Mile Markers
Soil Boundary
Survey Area
Drainage Ditch
Irrigation Canal
Freshwater Emergent Wetland
Freshwater Pond
Lake
Riverine

Source 1. Aerial; National Geospatial Intelligence Agency (2009).
2. Soils; USDA- NRCS SSURGO Database
Hidalgo County, Texas
3. Wetlands; USDOI-USFWS National Wetland Inventory (2010).

**FIGURE 3**
**Soils Map**
**Sheet 2 of 7**

Arroyo Colorado South Levee

International Boundary and Water Commission
United States Section




N

0 0.1 0.2 0.3 Miles

Mile Markers
Soil Boundary
Survey Area
Drainage Ditch
Irrigation Canal
Freshwater Emergent Wetland
Freshwater Pond
Lake
Riverine

Source
1. Aerial; National Geospatial Intelligence Agency (2009).
2. Soils; USDA- NRCS SSURGO Database
Hidalgo County, Texas
3. Wetlands; USDOI-USFWS National Wetland Inventory (2010)

**FIGURE 4**
**Soils Map**
**Sheet 3 of 7**
Arroyo Colorado South Levee

International Boundary and Water Commission
United States Section

N

Miles
0 0.1 0.2 0.3

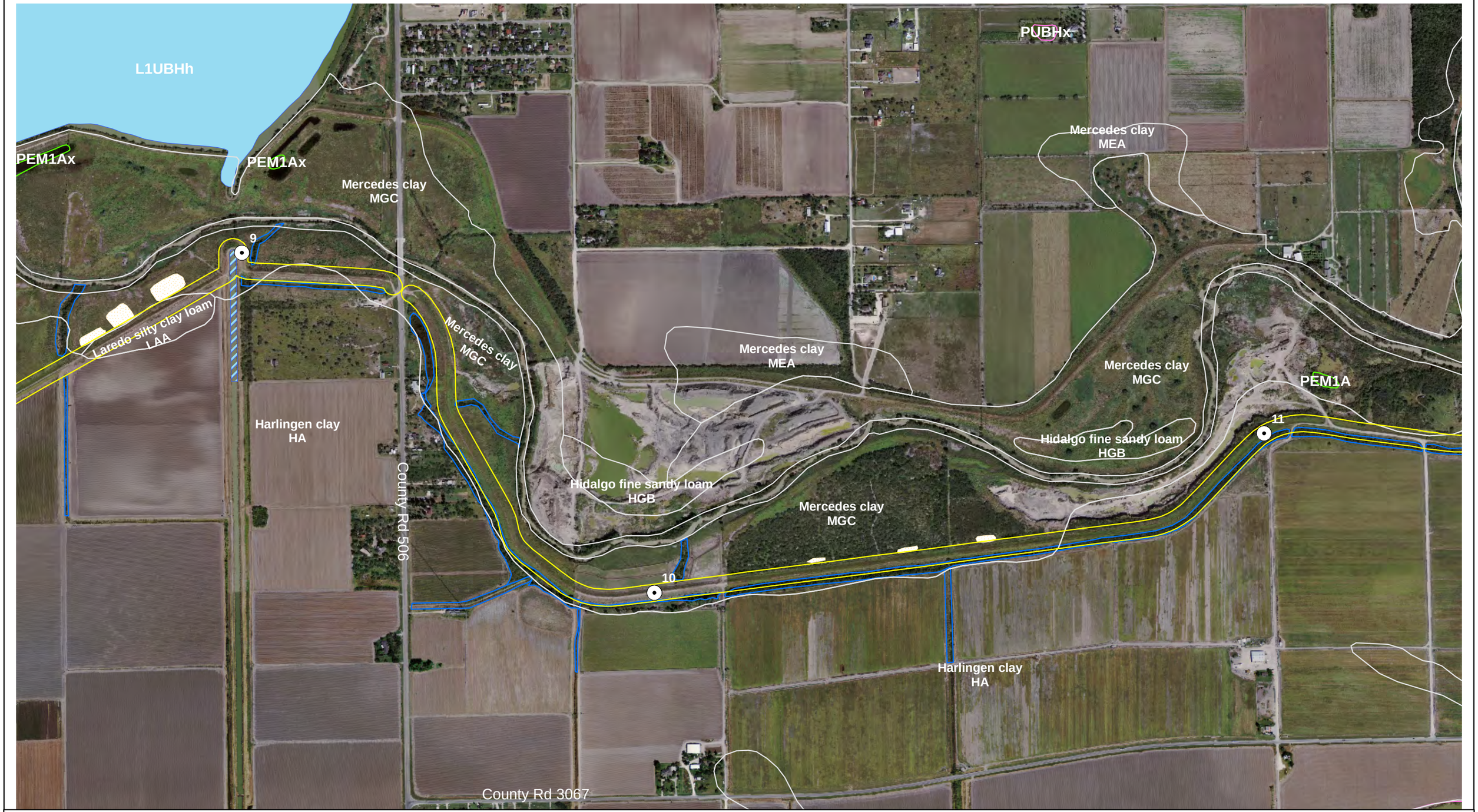
Mile Markers
Soil Boundary
Survey Area
Borrow Pit
Drainage Ditch
Irrigation Canal
Freshwater Emergent Wetland
Freshwater Pond
Lake
Riverine

Source
1. Aerial; National Geospatial Intelligence Agency (2009).
2. Soils; USDA- NRCS SSURGO Database
Cameron County, Texas
3. Wetlands; USDOI-USFWS National Wetland Inventory (2010).

**FIGURE 5**
**Soils Map**
**Sheet 4 of 7**

Arroyo Colorado South Levee

International Boundary and Water Commission
United States Section




N

Miles
0 0.1 0.2 0.3

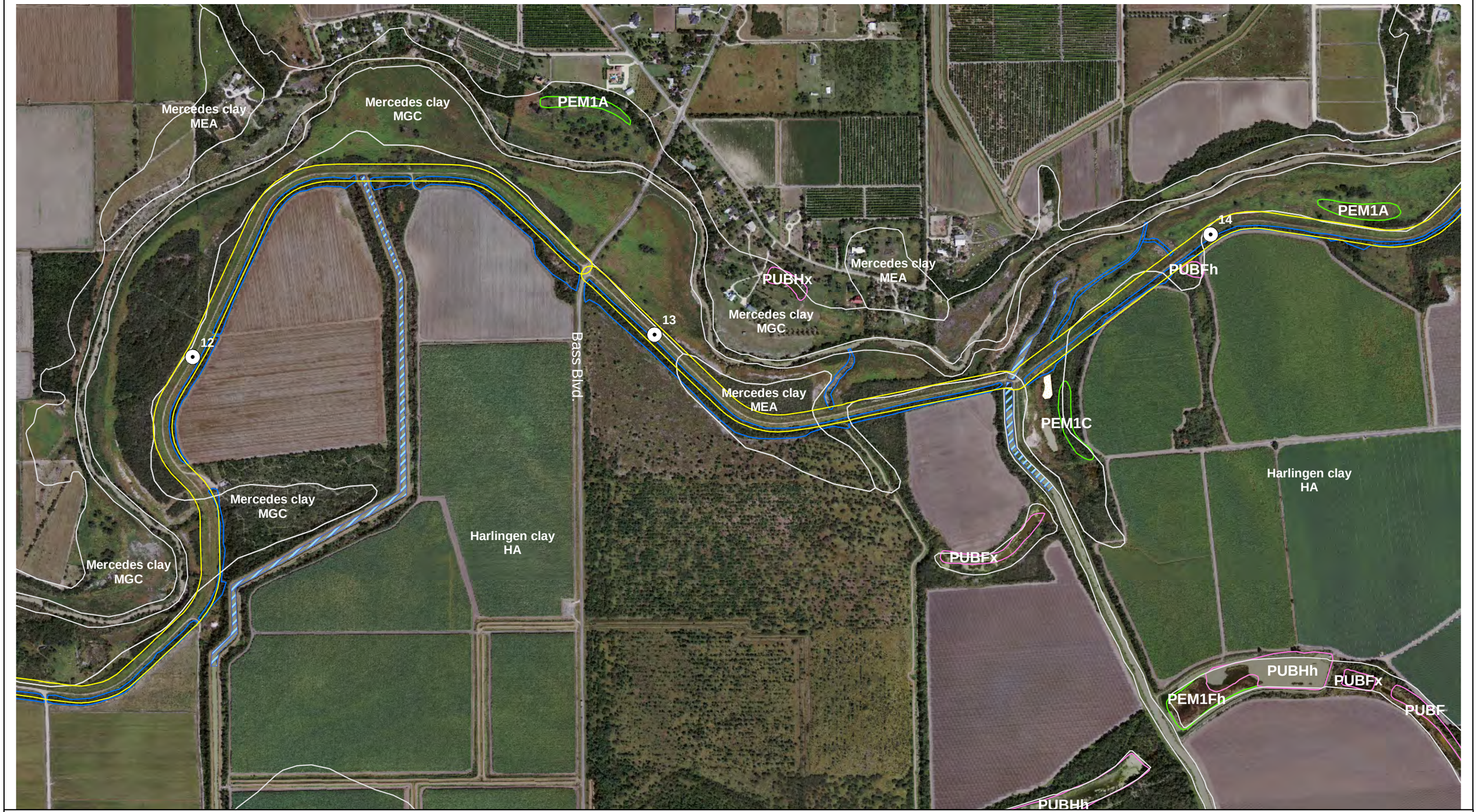
Mile Markers
Soil Boundary
Survey Area
Borrow Pit
Drainage Ditch
Irrigation Canal
Freshwater Emergent Wetland
Freshwater Pond
Lake
Riverine

Source
1. Aerial; National Geospatial Intelligence Agency (2009).
2. Soils; USDA- NRCS SSURGO Database
Cameron County, Texas
3. Wetlands; USDOI-USFWS National Wetland Inventory (2010)

**FIGURE 6**
**Soils Map**
**Sheet 5 of 7**

Arroyo Colorado South Levee

International Boundary and Water Commission
United States Section




N

Miles
0 0.1 0.2 0.3

Mile Markers
Soil Boundary
Survey Area
Borrow Pit
Drainage Ditch
Irrigation Canal
Freshwater Emergent Wetland
Freshwater Pond
Lake
Riverine

Source

1. Aerial; National Geospatial Intelligence Agency (2009).
2. Soils; USDA- NRCS SSURGO Database
Cameron County, Texas
3. Wetlands; USDOI-USFWS National Wetland Inventory (2010)

**FIGURE 7**
**Soils Map**
**Sheet 6 of 7**

Arroyo Colorado South Levee

International Boundary and Water Commission
United States Section

Mercedes clay
MGC

Mercedes clay
MGC

Harlingen clay
HA

15

PEM1Ah

Mercedes clay
MGC

Wetland A

PUBFx

Mercedes clay
MGC

Dilworth Rd.

Harlingen clay
HA

PUBFh

Harlingen clay
HA

PUBHh

Mercedes clay
MGC

PEM1A

16

Abd Rd.

N

0 0.1 0.2 0.3 Miles

Mile Markers
Soil Boundary
Survey Area
Borrow Pit
Drainage Ditch
Irrigation Canal
Wetland A
Freshwater Emergent Wetland
Freshwater Pond
Lake
Riverine

Source

1. Aerial; National Geospatial Intelligence Agency (2009).
2. Soils; USDA- NRCS SSURGO Database
Cameron County, Texas
3. Wetlands; USDOI-USFWS National Wetland Inventory (2010)

**FIGURE 8**
**Soils Map**
**Sheet 7 of 7**

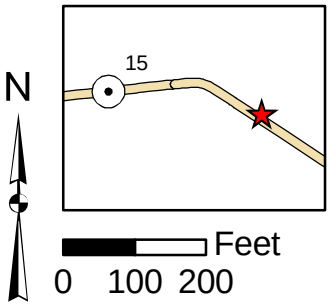
Arroyo Colorado South Levee

International Boundary and Water Commission
United States Section

# APPENDIX A

## SURVEY RESULTS -
## INCLUDED FOR EACH WETLAND DETERMINATION DATA POINT

- Wetland Determination Data Forms
- Photographic Log




Soil Boundary
Borrow Pit
Drainage Ditch
Irrigation Canal
Wetland A
WET4-dp
WET4-up

Source
1. Aerial; National Geospatial Intelligence Agency (2009).
2. Soils; USDA- NRCS SSURGO Database Cameron County, Texas

**FIGURE 9**
**Wetland Map**

Arroyo Colorado South Levee

International Boundary and Water Commission
United States Section

# WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Arroyo Colorado South Levee Rehabilitation City/County: Cameron Sampling Date: 2/25/2010

Applicant/Owner: United States Section of the International Boundary and Water Commission State: Texas Sampling Point: WET4 - DP

Investigator(s): Barrett Clark, Deborah Blackburn Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Levee Borrow Pit Local relief (concave, convex, none): Concave Slope (%): 3

Subregion (LRR or MLRA): LRR-T Lat: 26.140365 Long: -97.748964 Datum: NAD83

Soil Map Unit Name: Mercedes Clay (MGC) NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No ____ |
| Hydric Soil Present? | Yes X | No ____ |
| Wetland Hydrology Present? | Yes X | No ____ |

**Is the Sampled Area within a Wetland?** **Yes** X **No** ____

Remarks:

Levee construction borrow pit.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- X Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes X | No ____ | Depth (inches): 3 |
| Water Table Present? | Yes ____ | No X | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes X | No ____ | Depth (inches): 2 |

**Wetland Hydrology Present?** **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Region has received above-average precipitation prior to field investigation (2.09 inches in February 2010). During the previous six months from September 2009 through February 2010, 15.37 inches of rain fell, 1.23 inches above average.

**VEGETATION –** Use scientific names of plants.

Sampling Point: WET4 - DP

| Tree Stratum (Plot size: _____ ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | _____ = Total Cover | | |
| **Sapling Stratum** (Plot size: 5 ) | | | |
| 1. *Parkinsonia aculeata* | 7 | Y | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 7 = Total Cover | | |
| **Shrub Stratum** (Plot size: _____ ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | _____ = Total Cover | | |
| **Herb Stratum** (Plot size: 5 ) | | | |
| 1. *Eleocharis macrostachya (palustris)* | 40 | Y | OBL |
| 2. *Sporobolus cryptandrus* | 10 | Y | FACU |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 50 = Total Cover | | |
| **Woody Vine Stratum** (Plot size: _____ ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | _____ = Total Cover | | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: |
|---|---|---|
| OBL species | _____ | x 1 = _____ |
| FACW species | _____ | x 2 = _____ |
| FAC species | _____ | x 3 = _____ |
| FACU species | _____ | x 4 = _____ |
| UPL species | _____ | x 5 = _____ |
| Column Totals: | _____ (A) | _____ (B) |

Prevalence Index = B/A = _____

**Hydrophytic Vegetation Indicators:**

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

**Sapling** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

**Shrub** – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

**Herb** – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

**Woody vine** – All woody vines, regardless of height.

**Hydrophytic Vegetation Present?** **Yes** X **No** _____

Remarks: (If observed, list morphological adaptations below).

## SOIL

Sampling Point: WET4 - DP

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0 - 1.5 | 10 YR 4/1 | 100 | | | | | SiCL | Silty clay loam |
| 1.5 - 16 | 10 YR 4/1 | 100 | | | | | C | Clay |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- X Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12) **(LRR T, U)**
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** X **No** ___

Remarks:

Slight hydrogen sulfide odor in upper 2 inches.

# WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Arroyo Colorado South Levee Rehabilitation City/County: Cameron Sampling Date: 2/25/2010

Applicant/Owner: United States Section of the International Boundary and Water Commission State: Texas Sampling Point: WET4 - UP

Investigator(s): Barrett Clark, Deborah Blackburn Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Levee Borrow Pit Local relief (concave, convex, none): Concave Slope (%): 3

Subregion (LRR or MLRA): LRR-T Lat: 26.140392 Long: -97.748917 Datum: NAD83

Soil Map Unit Name: Mercedes Clay (MGC) NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes _____ | No X | **Is the Sampled Area within a Wetland?** **Yes** _____ **No** X |
| Hydric Soil Present? | Yes _____ | No X | |
| Wetland Hydrology Present? | Yes _____ | No X | |

Remarks:

Near fringe of levee construction borrow pit.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes _____ | No X | Depth (inches): _____ |
| Water Table Present? | Yes _____ | No X | Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes _____ | No X | Depth (inches): _____ |

**Wetland Hydrology Present?** **Yes** _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Region has received above-average precipitation prior to field investigation (2.09 inches in February 2010). During the previous six months from September 2009 through February 2010, 15.37 inches of rain fell, 1.23 inches above average.

**VEGETATION –** Use scientific names of plants.

Sampling Point: WET4 - UP

| Tree Stratum (Plot size: _____ ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | _____ = Total Cover | | |
| **Sapling Stratum** (Plot size: 5 ) | | | |
| 1. *Acacia farnesiana* | 10 | Y | UPL |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 10 = Total Cover | | |
| **Shrub Stratum** (Plot size: _____ ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | _____ = Total Cover | | |
| **Herb Stratum** (Plot size: 5 ) | | | |
| 1. *Sporobolus cryptandrus* | 60 | Y | FACU |
| 2. *Lesquerella lindheimeri* | 5 | N | UPL |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 65 = Total Cover | | |
| **Woody Vine Stratum** (Plot size: _____ ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | _____ = Total Cover | | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: |
|---|---|---|
| OBL species | _____ | x 1 = _____ |
| FACW species | _____ | x 2 = _____ |
| FAC species | _____ | x 3 = _____ |
| FACU species | _____ | x 4 = _____ |
| UPL species | _____ | x 5 = _____ |
| Column Totals: | _____ (A) | _____ (B) |

Prevalence Index = B/A = _____

**Hydrophytic Vegetation Indicators:**

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

**Sapling** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

**Shrub** – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

**Herb** – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

**Woody vine** – All woody vines, regardless of height.

**Hydrophytic Vegetation Present?** **Yes** _____ **No** X

Remarks: (If observed, list morphological adaptations below).

## SOIL

Sampling Point: WET4 - UP

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0 - 2 | 10 YR 3/2 | 100 | | | | | SiC | Silty clay |
| 2 - 16 | 10 YR 3/2 | 100 | | | | | C | Clay |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Organic Bodies (A6) **(LRR P, T, U)**
___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
___ Muck Presence (A8) **(LRR U)**
___ 1 cm Muck (A9) **(LRR P, T)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Coast Prairie Redox (A16) **(MLRA 150A)**
___ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR P, S, T, U)**
___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

**Indicators for Problematic Hydric Soils[3]:**

___ 1 cm Muck (A9) **(LRR O)**
___ 2 cm Muck (A10) **(LRR S)**
___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12) **(LRR T, U)**
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** _____ **No** X

Remarks:

No hydric soil indicators observed.

# WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Arroyo Colorado South Levee Rehabilitation City/County: Cameron Sampling Date: 2/25/2010

Applicant/Owner: United States Section of the International Boundary and Water Commission State: Texas Sampling Point: WET1 - UP

Investigator(s): Barrett Clark, Deborah Blackburn Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Levee Borrow Pit Local relief (concave, convex, none): Concave Slope (%): 3

Subregion (LRR or MLRA): LRR-T Lat: 26.119796 Long: -97.848689 Datum: NAD83

Soil Map Unit Name: Harlingen Clay (HA) NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No ____ | **Is the Sampled Area within a Wetland?** **Yes** ____ **No** X |
| Hydric Soil Present? | Yes ____ | No X | |
| Wetland Hydrology Present? | Yes X | No ____ | |

Remarks:

Data point located in an inundated levee construction borrow pit with hydrophytic vegetation. No hydric soil indicators were observed.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes X | No ____ | Depth (inches): 3 |
| Water Table Present? | Yes ____ | No X | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes X | No ____ | Depth (inches): 3 |

**Wetland Hydrology Present?** **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Region has received above-average precipitation prior to field investigation (2.09 inches in February 2010). During the previous six months from September 2009 through February 2010, 15.37 inches of rain fell, 1.23 inches above average.

**VEGETATION –** Use scientific names of plants.

Sampling Point: WET1 - UP

| Tree Stratum (Plot size: _____ ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | _____ = Total Cover | | |
| **Sapling Stratum** (Plot size: 5 ) | | | |
| 1. *Parkinsonia aculeata* | 7 | Y | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 7 = Total Cover | | |
| **Shrub Stratum** (Plot size: _____ ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | _____ = Total Cover | | |
| **Herb Stratum** (Plot size: 5 ) | | | |
| 1. *Eleocharis macrostachya (palustris)* | 20 | Y | OBL |
| 2. *Phyla nodiflora var. reptans* | 10 | Y | FAC |
| 3. *Marsilea macropoda* | 5 | Y | OBL |
| 4. *Lesquerella lindheimeri* | 5 | Y | UPL* |
| 5. *Lycium carolinianum var. quadrifidum* | 5 | Y | UPL* |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 45 = Total Cover | | |
| **Woody Vine Stratum** (Plot size: _____ ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | _____ = Total Cover | | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: |
|---|---|---|
| OBL species | _____ | x 1 = _____ |
| FACW species | _____ | x 2 = _____ |
| FAC species | _____ | x 3 = _____ |
| FACU species | _____ | x 4 = _____ |
| UPL species | _____ | x 5 = _____ |
| Column Totals: | _____ (A) | _____ (B) |

Prevalence Index = B/A = _____

**Hydrophytic Vegetation Indicators:**

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

**Sapling** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

**Shrub** – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

**Herb** – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

**Woody vine** – All woody vines, regardless of height.

**Hydrophytic Vegetation Present?** **Yes** X **No** _____

Remarks: (If observed, list morphological adaptations below).

## SOIL

Sampling Point: WET1 - UP

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0 - 3 | 10 YR 5/2 | 100 | | | | | SCL | Sandy clay loam |
| 3 - 16 | 10 YR 5/2 | 100 | | | | | C | Clay |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Organic Bodies (A6) **(LRR P, T, U)**
___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
___ Muck Presence (A8) **(LRR U)**
___ 1 cm Muck (A9) **(LRR P, T)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Coast Prairie Redox (A16) **(MLRA 150A)**
___ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR P, S, T, U)**
___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

**Indicators for Problematic Hydric Soils[3]:**

___ 1 cm Muck (A9) **(LRR O)**
___ 2 cm Muck (A10) **(LRR S)**
___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12) **(LRR T, U)**
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** _____ **No** X

Remarks:

No hydric soil indicators observed.

# WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Arroyo Colorado South Levee Rehabilitation City/County: Cameron Sampling Date: 2/25/2010

Applicant/Owner: United States Section of the International Boundary and Water Commission State: Texas Sampling Point: WET2 - UP

Investigator(s): Barrett Clark, Deborah Blackburn Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Levee Borrow Pit Local relief (concave, convex, none): Concave Slope (%): 3

Subregion (LRR or MLRA): LRR-T Lat: 26.122495 Long: -97.811382 Datum: NAD83

Soil Map Unit Name: Mercedes Clay (MGC) NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ____ | No X | **Is the Sampled Area within a Wetland?** **Yes** ____ **No** X |
| Hydric Soil Present? | Yes ____ | No X | |
| Wetland Hydrology Present? | Yes X | No ____ | |

Remarks:

Data point located in an inundated levee construction borrow pit with some hydrophytic vegetation present (Failed dominance test and prevalence index). No hydric soil indicators were observed.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes X | No ____ | Depth (inches): 3 |
| Water Table Present? | Yes ____ | No X | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes X | No ____ | Depth (inches): 3 |

**Wetland Hydrology Present?** **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Region has received above-average precipitation prior to field investigation (2.09 inches in February 2010). During the previous six months from September 2009 through February 2010, 15.37 inches of rain fell, 1.23 inches above average.

**VEGETATION –** Use scientific names of plants.

Sampling Point: WET2 - UP

| Tree Stratum (Plot size: 30) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Acacia farnesiana* | 10 | Y | UPL* |
| 2. *Prosopis glandulosa* | 10 | Y | UPL |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 20 | = Total Cover | |

| Sapling Stratum (Plot size: ) | | | |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | | = Total Cover | |

| Shrub Stratum (Plot size: ) | | | |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | | = Total Cover | |

| Herb Stratum (Plot size: 5) | | | |
|---|---|---|---|
| 1. *Phyla nodiflora var. reptans* | 30 | Y | FAC |
| 2. *Borrichia frutescens* | 10 | Y | UPL* |
| 3. *Echinodorus berteroi* | 10 | Y | OBL |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 50 | = Total Cover | |

| Woody Vine Stratum (Plot size: ) | | | |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | | = Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 10 | x 1 = | 10 |
| FACW species | | x 2 = | |
| FAC species | 40 | x 3 = | 120 |
| FACU species | | x 4 = | |
| UPL species | 30 | x 5 = | 150 |
| Column Totals: | 80 (A) | | 280 (B) |

Prevalence Index = B/A = 3.5

**Hydrophytic Vegetation Indicators:**

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

**Sapling** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

**Shrub** – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

**Herb** – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

**Woody vine** – All woody vines, regardless of height.

**Hydrophytic Vegetation Present?** **Yes** _____ **No** X

Remarks: (If observed, list morphological adaptations below).

Hydrophytic species present but failed dominance test and prevalence index.

## SOIL

Sampling Point: WET2 - UP

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0 - 2 | 10 YR 5/2 | 100 | | | | | SiCL | Silty clay loam |
| 2 - 16 | 10 YR 5/2 | 100 | | | | | C | Clay |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Organic Bodies (A6) **(LRR P, T, U)**
___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
___ Muck Presence (A8) **(LRR U)**
___ 1 cm Muck (A9) **(LRR P, T)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Coast Prairie Redox (A16) **(MLRA 150A)**
___ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR P, S, T, U)**
___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

**Indicators for Problematic Hydric Soils[3]:**

___ 1 cm Muck (A9) **(LRR O)**
___ 2 cm Muck (A10) **(LRR S)**
___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12) **(LRR T, U)**
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** _____ **No** X

Remarks:

No hydric soil indicators observed.

# WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Arroyo Colorado South Levee Rehabilitation City/County: Cameron Sampling Date: 2/25/2010

Applicant/Owner: United States Section of the International Boundary and Water Commission State: Texas Sampling Point: WET3 - UP

Investigator(s): Barrett Clark, Deborah Blackburn Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 3

Subregion (LRR or MLRA): LRR-T Lat: 26.132817 Long: -97.774256 Datum: NAD83

Soil Map Unit Name: Mercedes Clay (MGC) NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No X (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No ___ | **Is the Sampled Area within a Wetland?** **Yes** ___ **No** X |
| Hydric Soil Present? | Yes ___ | No X | |
| Wetland Hydrology Present? | Yes X | No ___ | |

Remarks:

Data point located in a low concave area created by elevated irrigation canal and levees. Hydrophytic vegetation present. No hydric soil indicators were observed.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ___ | No X | Depth (inches): ___ |
| Water Table Present? | Yes ___ | No X | Depth (inches): ___ |
| Saturation Present? (includes capillary fringe) | Yes X | No ___ | Depth (inches): 3 |

**Wetland Hydrology Present?** **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Region has received above-average precipitation prior to field investigation (2.09 inches in February 2010). During the previous six months from September 2009 through February 2010, 15.37 inches of rain fell, 1.23 inches above average.

**VEGETATION –** Use scientific names of plants.

Sampling Point: WET3 - UP

| Tree Stratum (Plot size: _____ ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | _____ = Total Cover | | |

| Sapling Stratum (Plot size: _____ ) | | | |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | _____ = Total Cover | | |

| Shrub Stratum (Plot size: _____ ) | | | |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | _____ = Total Cover | | |

| Herb Stratum (Plot size: 5 ) | | | |
|---|---|---|---|
| 1. *Polygonum periscaria* | 80 | Y | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 80 = Total Cover | | |

| Woody Vine Stratum (Plot size: _____ ) | | | |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | _____ = Total Cover | | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: |
|---|---|---|
| OBL species | _____ | x 1 = _____ |
| FACW species | _____ | x 2 = _____ |
| FAC species | _____ | x 3 = _____ |
| FACU species | _____ | x 4 = _____ |
| UPL species | _____ | x 5 = _____ |
| Column Totals: | _____ (A) | _____ (B) |

Prevalence Index = B/A = _____

**Hydrophytic Vegetation Indicators:**

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

**Sapling** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

**Shrub** – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

**Herb** – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

**Woody vine** – All woody vines, regardless of height.

**Hydrophytic Vegetation Present?** **Yes** X **No** _____

Remarks: (If observed, list morphological adaptations below).

Nearly homogenous vegetation. Occasional Rumex sp. present.

## SOIL

Sampling Point: WET3 - UP

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0 - 3 | 10 YR 4/2 | 100 | | | | | SiC | Silty clay |
| 3 - 7 | 10 YR 4/2 | 100 | | | | | C | Clay, matrix grading at 7" |
| 7 - 16 | 7.5 YR 5/4 | 100 | | | | | C | Clay, matrix grading at 7" |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Organic Bodies (A6) **(LRR P, T, U)**
___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
___ Muck Presence (A8) **(LRR U)**
___ 1 cm Muck (A9) **(LRR P, T)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Coast Prairie Redox (A16) **(MLRA 150A)**
___ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR P, S, T, U)**
___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

**Indicators for Problematic Hydric Soils[3]:**

___ 1 cm Muck (A9) **(LRR O)**
___ 2 cm Muck (A10) **(LRR S)**
___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12) **(LRR T, U)**
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** _____ **No** X

Remarks:

No hydric soil indicators observed. Soil drier than previous soil excavations despite being located in relatively deep, concave, low area.

# PHOTOGRAPHIC LOG

| | |
|---|---|
| **Client: United States Section, International Boundary and Water Commission** | **Project Number: 174293** |
| **Project Name: Arroyo Colorado South Levee Rehabilitation** | **County, State: Hidalgo County, Texas** |

| | |
|---|---|
| **Photograph ID: 1**<br>**Feature: Agricultural/ Levee Borrow Ditch**<br>**Date: 2/22/2010**<br>**Comments: Agricultural/ Levee borrow ditch adjacent to and paralleling south levee with woody vegetation. Agricultural field in background. Facing southeast.** | |
| **Photograph ID: 2**<br>**Feature: Agricultural drainage canal**<br>**Date: 2/22/2010**<br>**Comments: Agricultural drainage canal near levee mile 1. Facing south, upstream of south levee crossing.** | |

# PHOTOGRAPHIC LOG

| | |
|---|---|
| **Client: United States Section, International Boundary and Water Commission** | **Project Number: 174293** |
| **Project Name: Arroyo Colorado South Levee Rehabilitation** | **County, State: Hidalgo County, Texas** |

| | |
|---|---|
| **Photograph ID: 3**<br>**Feature: Agricultural drainage canal**<br>**Date: 2/22/2010**<br>**Comments: Agricultural drainage canal near levee mile 1. Facing north, downstream of south levee crossing.** | |
| **Photograph ID: 4**<br>**Feature: Agricultural/ levee borrow ditch**<br>**Date: 2/22/2010**<br>**Comments: Agricultural/ levee borrow ditch adjacent to and paralleling the south levee. Upland vegetation. Facing east.** | |

# PHOTOGRAPHIC LOG

| | |
|---|---|
| **Client: United States Section, International Boundary and Water Commission** | **Project Number: 174293** |
| **Project Name: Arroyo Colorado South Levee Rehabilitation** | **County, State: Cameron County, Texas** |

| | |
|---|---|
| **Photograph ID: 5**<br>**Feature: Agricultural drainage canal**<br>**Date: 2/22/2010**<br>**Comments: Eroded agricultural drainage canal at levee mile 10. Facing north, downstream of south levee crossing. Active cattle rangeland.** | |
| **Photograph ID: 6**<br>**Feature: Impounded drainage canal**<br>**Date: 2/22/2010**<br>**Comments: Impounded drainage canal at levee mile 14. Facing south.** | |

# PHOTOGRAPHIC LOG

| | |
|---|---|
| **Client: United States Section, International Boundary and Water Commission** | **Project Number: 174293** |
| **Project Name: Arroyo Colorado South Levee Rehabilitation** | **County, State: Cameron County, Texas** |

| | |
|---|---|
| **Photograph ID: 7**<br>**Feature: Impounded drainage canal**<br>**Date: 2/22/2010**<br>**Comments: Impounded drainage canal at levee mile 15. Facing south.** | |
| **Photograph ID: 8**<br>**Feature: Wetland A – Levee borrow pit**<br>**Date: 2/25/2010**<br>**Comments: Wetland A, Levee construction borrow pit. Facing east.** | |

# PHOTOGRAPHIC LOG

| | |
|---|---|
| **Client: United States Section, International Boundary and Water Commission** | **Project Number: 174293** |
| **Project Name: Arroyo Colorado South Levee Rehabilitation** | **County, State: Hidalgo County, Texas** |

| | |
|---|---|
| **Photograph ID: 9** | |
| **Feature: Agricultural/ levee borrow ditch** | |
| **Date: 2/24/2010** | |
| **Comments: Agricultural/ Levee borrow ditch adjacent to and paralleling south levee with emergent vegetation. Agricultural field in background. Facing southeast.** | |
| **Photograph ID: 10** | |
| **Feature: Levee borrow pits.** | |
| **Date: 2/24/2010** | |
| **Comments: Non-wetland levee borrow pits within old-field/rangeland. Facing northeast.** | |

# PHOTOGRAPHIC LOG

| | |
|---|---|
| **Client: United States Section, International Boundary and Water Commission** | **Project Number: 174293** |
| **Project Name: Arroyo Colorado South Levee Rehabilitation** | **County, State: Hidalgo County, Texas** |

| | |
|---|---|
| **Photograph ID: 9** | |
| **Feature: Irrigation canal** | |
| **Date: 2/24/2010** | |
| **Comments: Irrigation canal at levee mile 9. Facing south.** | |

# APPENDIX D:
# Correspondence

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

OFFICE OF THE COMMISSIONER
UNITED STATES SECTION

March 23, 2010

Mr. Lloyd Mullins
U.S. Army Corps of Engineers
Galveston District
Corpus Christi Regulatory Field Office
5151 Flynn Parkway, Suite 306
Corpus Christi, Texas 78411-4318

Subject: STIMULUS PROJECT (American Recovery and Reinvestment Act of 2009)
Arroyo Colorado South Levee Rehabilitation Project in Hidalgo and Cameron Counties
United States Section, International Boundary and Water Commission
Request for Preliminary Jurisdictional Determination

Dear Mr. Mullins:

The United States Section of the International Boundary and Water Commission (USIBWC) requests a Preliminary Jurisdictional Determination of the subject project area under the Clean Water Act. The Arroyo Colorado South Levee (ACSL) is a component of the Lower Rio Grande Flood Control Project and protects urban, suburban, and highly developed irrigated farmland. The purpose of the project is to improve the ACSL in order to address the 100-year flood protection criteria established by FEMA. Improvements to the ACSL are needed to retain FEMA levee system certification, as areas currently protected by the ACSL were identified by FEMA to be insufficiently protected.

The project consists of improvements to the ACSL from FM 1015 near Progreso, Texas to Parker Road near Harlingen, Texas, a distance of approximately 16 miles (see enclosed location map). The approximate coordinates for the west end of the ACSL are UTM Zone 14, 604074E, 2888689N and UTM Zone 14, 625894E, 2891104N for the east end of the ACSL. The existing levee is a raised trapezoidal compacted-earth structure with a crown width of 16 feet, a typical height ranging from 10 to 15 feet, and an approximate 3:1 side slope ratio (units of horizontal run in feet per foot of vertical rise). The levee crown is an unpaved service road with restricted public access. The existing levee footprint typically ranges from 70 to 100 feet, depending on location.

Improvements to the ACSL include raising the levee by adding fill material to the existing levee to bring flood control to the original design specifications with a minimum of 3-feet of freeboard. A hydraulic evaluation indicated that an increase in levee height, up to 6-feet, would be necessary in a number of sections of the ACSL to meet design criteria for flood protection. Addition of fill material would be placed on top of the levee, extending the footprint beyond the toe of the existing levee. Levee footprint expansion would occur within the maintained floodway and within the USIBWC right-of-way (ROW). For a typical levee cross-section with height

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(915) 832-4100 • (FAX) (915) 832-4190 • http://www.ibwc.state.gov

increases of up to 6 feet, the levee footprint would be expanded by 36 feet, 18 feet on either side of the levee. The need for excavation outside the levee structure is not anticipated.

There are commercial sand pits within the Arroyo Colorado floodway, but these will not be utilized to obtain fill material. Vehicles would access the project area by means of existing levee access or farm roads. No new haul roads would be constructed. The majority of work to raise the levee would occur on top of the existing levee. Belly dump trucks would carry commercially obtained fill material to the top of the levee. Areas requiring placement of fill material on the sides of the embankments would be accessed from the top of the levee road and spread over the embankments until the desired thickness has been reached. Compaction equipment would follow behind to compact fill to the required height. After increasing the height of the levee and extending the footprint, where necessary, the easement area adjacent to the levee, up to 35 feet on either side, would also be subject to compaction.

Please find enclosed a wetland delineation report that includes a location map; aerial photographs of the project area; and recent site photographs of the project area.

We appreciate your immediate attention and any additional consideration that can be provided on this project due to the upcoming deadline of September 2010 for stimulus funds to be spent. If you have any questions or concerns, please contact Natural Resources Specialist Lisa Santana at (915) 832-4707 or by email at lisasantana@ibwc.gov

Sincerely,

Daniel Borunda
Acting Chief
Environmental Management Division

Attachments:
As stated

OFFICE OF THE COMMISSIONER
UNITED STATES SECTION

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

April 19, 2010

Dear Reviewer:

The United States Section, International Boundary and Water Commission, United States and Mexico (USIBWC) invite the public to review and comment on the Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI) on the Improvements to the Arroyo Colorado South Levee in Hidalgo and Cameron Counties, Texas. The EA evaluates environmental effects that may result from the proposed expansion of the Arroyo Colorado South Levee system in order to address the 100-year flood protection criteria established by the Federal Emergency Management Agency. The results of the analysis of the Draft EA, and all comments received, will be used by USIBWC prior to making a final decision. The Draft EA is available for a 30-day review and comment period. An electronic copy of the Draft EA and FONSI can be found at:

http://www.ibwc.gov/Organization/Environmental/EIS_EA_Public_Comment.html

The Final EA will be prepared considering the comments received and will be sent to those who commented on the Draft EA. Please submit your comments so they are postmarked by May 26, 2010.

Written comments should be addressed to:

Lisa Santana
Natural Resources Specialist
Environmental Management Division, USIBWC
4171 North Mesa, C-100
El Paso, Texas 79902

Thank you for your interest in the evaluation of the Draft EA for improvements to the Arroyo Colorado South Levee flood control project.

Sincerely,

Daniel Borunda.
Acting Division Chief
Environmental Management Division

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

April 30, 2010

Ms Lisa Santana
Natural Resources Specialist
Environmental Management Division, USIBWC
4171 N. Mesa Street, C-100
El Paso, Texas 79902

Subject: Improvements to the Arroyo Colorado South Levee, Hidalgo-Cameron Counties, Texas

Dear Ms Santana:

We have reviewed the Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FNSI) for the proposed improvements to the Arroyo Colorado South Levee in Hidalgo and Cameron Counties, Texas. We note that you are coordinating your activities with the appropriate service agencies, and we concur with your findings.

We have no comment on the proposed project. We appreciate the opportunity to review the DEA-DFNSI documents. The documents are very clear and concise and facilitated the review of the proposal. Please contact Hector Pena of my staff at (214) 665-7453, if you need further assistance on this matter.

Sincerely yours,

Cathy Gilmore
Chief,
Office of Planning
and Coordination

RECEIVED
MAY 3 2010
IBWC

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

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Protecting Texas by Reducing and Preventing Pollution*

May 3, 2010

Ms. Lisa Santana
Natural Resources Specialist
Environmental Management Division, USIBWC
4171 North Mesa, C-100
El Paso, TX 79902

Re: TCEQ Grant and Texas Review and Comment System (TRACS) #2010-249, Hidalgo and Cameron Counties - Arroyo Colorado South Levee

Dear Ms. Santana:

The Texas Commission on Environmental Quality (TCEQ) has reviewed the above-referenced project and offers following comments:

A review of the project for General Conformity impact in accordance with 40 CFR Part 93 and Title 30, Texas Administrative Code § 101.30 indicates that the proposed action is located in Hidalgo and Cameron Counties, which are currently unclassified or in attainment of the National Ambient Air Quality Standards for all six criteria air pollutants. Therefore, General Conformity does not apply.

Although any demolition, construction, rehabilitation or repair project will produce dust and particulate emissions, these actions should pose no significant impact upon air quality standards. Any minimal dust and particulate emissions should be easily controlled by the construction contractors using standard dust mitigation techniques.

We do not anticipate significant long term environmental impacts from this project as long as construction and waste disposal activities are completed in accordance with applicable local, state and federal statutes and regulations. We agree with a finding of no significant impact and have no objection to the release of funds for this project. We recommend that best management practices to control runoff from construction sites be utilized to prevent impact to surface and groundwater.

Thank you for the opportunity to review this project. If you have any questions, please call Ms. Tangela Niemann at (512) 239-3786.

Sincerely,

Jim Harrison, Director
Intergovernmental Relations Division

**DEPARTMENT OF THE ARMY**
**GALVESTON DISTRICT, CORPS OF ENGINEERS**
**5151 FLYNN PARKWAY #306**
**CORPUS CHRISTI, TX 78411-4318**

May 25, 2010

**REPLY TO ATTENTION OF:**

Corpus Christi Regulatory Field Office

SUBJECT: Project File SWG-2010-00333

Ms. Lisa Santana
Natural Resource Specialist
Environmental Management Division, USIBWC
4171 North Mesa, C-100
El Paso, Texas 79902

Dear Ms. Santana:

This is in reference to your notice dated April 19, 2010 in which you requested that we review the jurisdictional status of the proposed improvements to the Arroyo Colorado South Levee to meet 100-year flood protection criteria established by the Federal Emergency Management Agency (FEMA). Improvements include raising the levee by adding fill material to meet the minimum of 3 feet of freeboard, which would increase the footprint of the south levee by a maximum of 18 feet on each side. The project site is located along the Arroyo Colorado South Levee from Farm-to-Market Road 1015 to Parker Road in Hidalgo and Cameron Counties, Texas, as depicted on the enclosed 8 pages.

The Corps of Engineers has the authority to regulate certain work under the provisions of Section 10 of the Rivers and Harbor Act and Section 404 of the Clean Water Act (Section 404). Section 404 provides for the regulation of the discharge of fill material into Waters of the United States, which includes all wetlands adjacent to tidal and non-tidal waters. Isolated wetlands and outlying areas that are seasonally saturated may be regulated under the provisions of Section 404 depending on their relationship with interstate commerce.

We have reviewed the U.S. Geological Survey topographic maps of Harlingen, La Feria, Mercedes, Progreso, and Santa Maria, Texas 7.5 minute quadrangles, aerial photography, 1981 USDA Natural Resource Conservation Service Soil Survey, FEMA flood maps, and the submitted plans. We have determined that the site does contain waters of the United States that are subject to our jurisdiction under Section 404 of the Clean Water Act, and that a Department of the Army (DA) Permit will be required prior to the placement of fill material into those waters and/or wetlands. The jurisdictional areas are indicated on the enclosed 8 pages and numbered 1-7. The landward jurisdictional limits of these areas are the ordinary high water mark (OHWM) or the upper extent of adjacent wetlands, whichever is the greater. In order to process a permit request for the proposed activity an application and drawings must be submitted to our office. Information on the methodology for delineating wetlands, and also the information required for a DA permit application can be found on our website at www.swg.usace.army.mil/reg/.

This letter contains an approved jurisdictional determination for your subject site. If you object to this determination, you may request an administrative appeal under Corps regulations at

33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and Request for Appeal (RFA) form. If you request to appeal this determination you must submit a completed RFA form to the Southwestern Division Office at the following address:

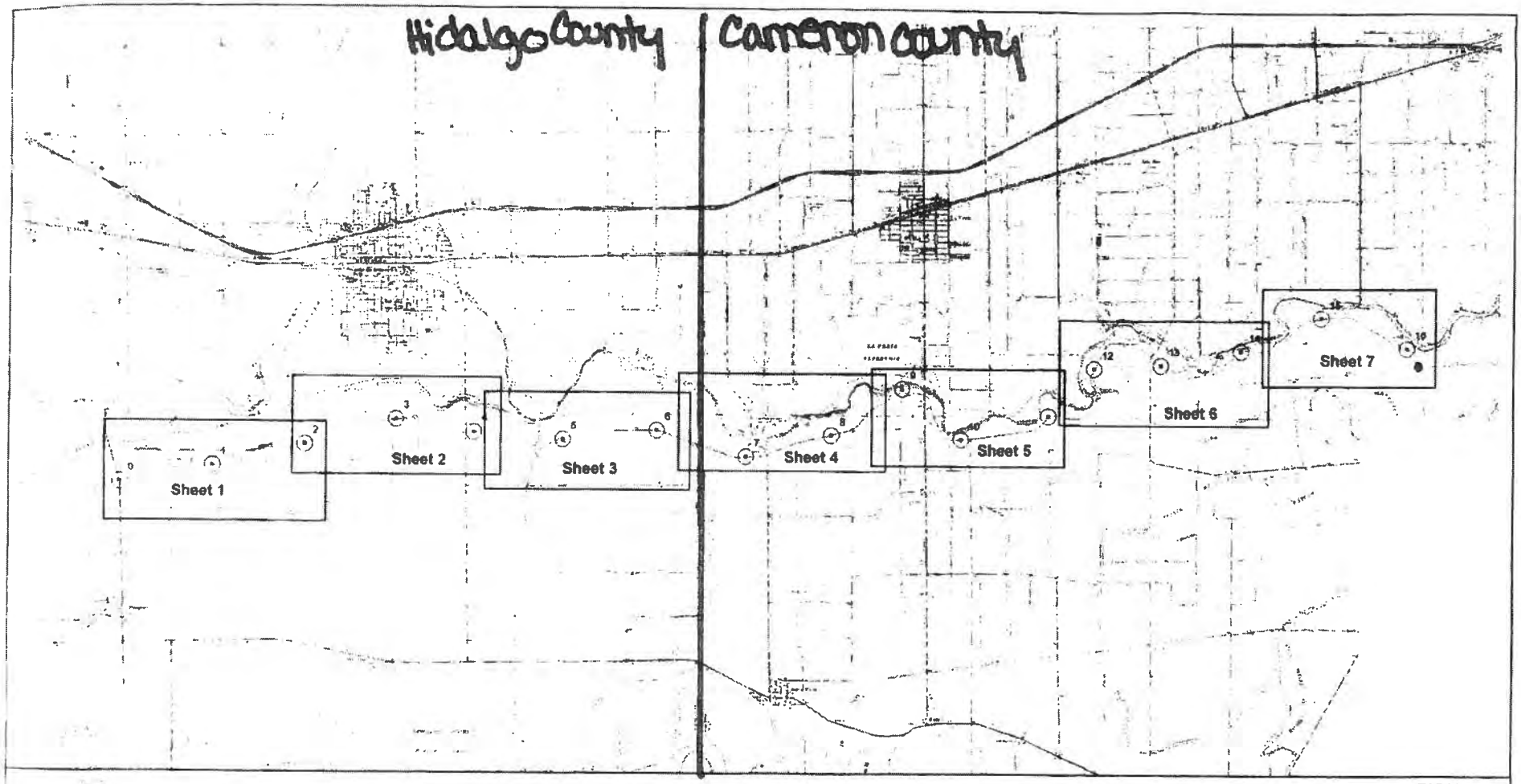
Elliott N. Carman, Appeal Review Officer
US Army Engineer Division, Southwestern
1100 Commerce Street, Suite 831
Dallas TX 75242-1317
Telephone: 496-487-7037; FAX: 469-487-7199

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 C.F.R. part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. It is not necessary to submit an RFA form to the Division office if you do not object to the determination in this letter.

This approved determination is valid for 5 years from the date of this letter unless new information warrants a revision of the determination prior to the expiration date. Please reference determination number **SWG-2010-00333** in future correspondence pertaining to this subject. If you have any questions concerning this determination or possible appeal of this determination, please contact Misti Grohmann at the letterhead address or by telephone at 361-814-5847 Ext 128 if you have any questions. To assist us in improving our service to you, please complete the survey found at http://per2.nwp.usace.army.mil/survey.html

Sincerely,

Lloyd Mullins, Supervisor
Corpus Christi Regulatory Office



N

0 1 2 3 Miles

Mile Markers

East End of Levee

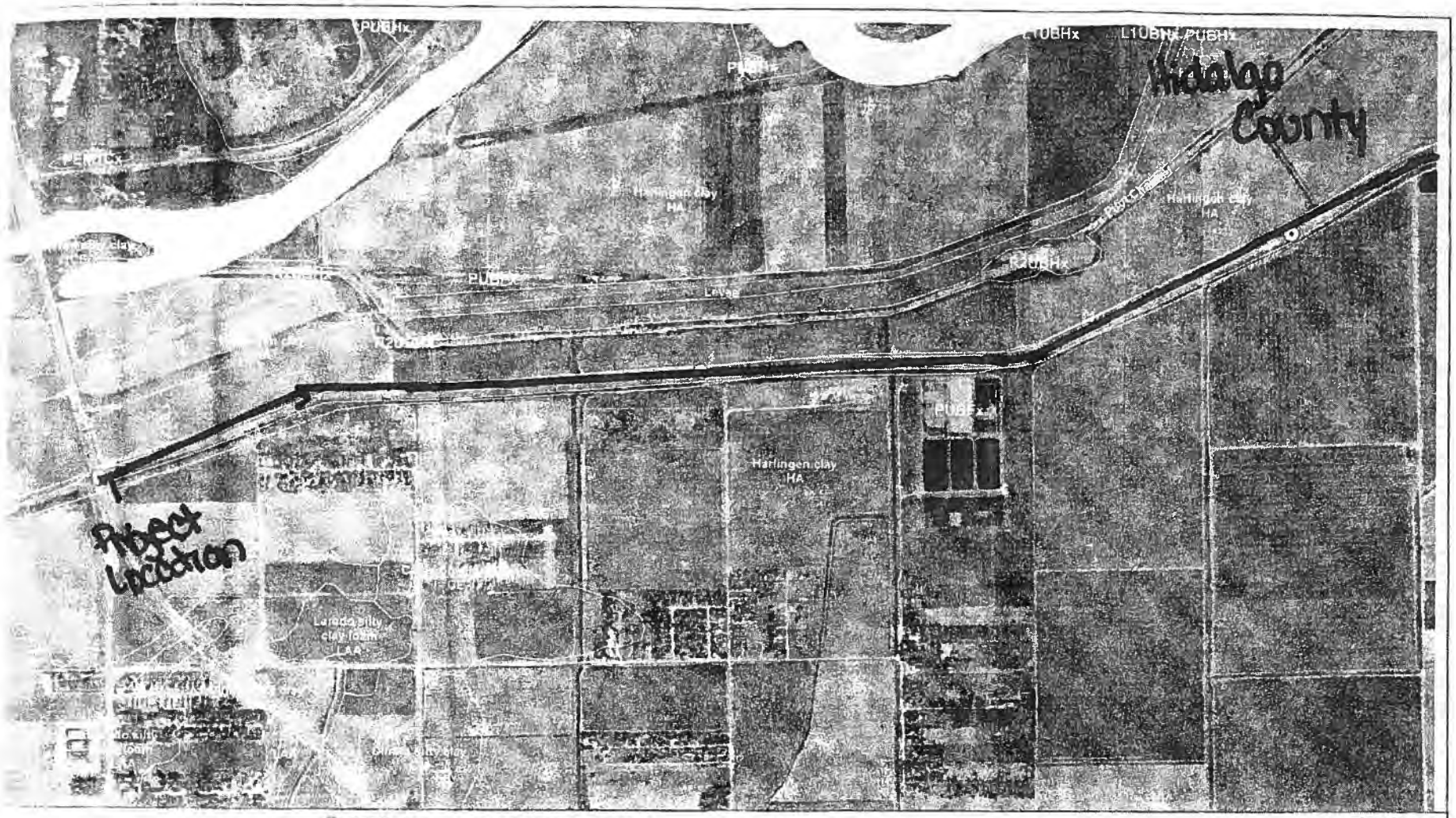
Source
USGS Harlingen, La Feria, Mercedes, Progreso and Santa Maria Quadrangles (2002).
Hidalgo and Cameron Counties, Texas

**FIGURE 1**
**Site Location Map**

Arroyo Colorado South Levee

International Boundary and Water Commission
United States Section

SWG-2010-00333
Pg 1 of 8




N

Mile Markers
Soil Boundary
Survey Area
Drainage Ditch
Irrigation Canal
Freshwater Emergent Wetland
Freshwater Pond
Lake
Riverine

Miles
0 0.1 0.2 0.3

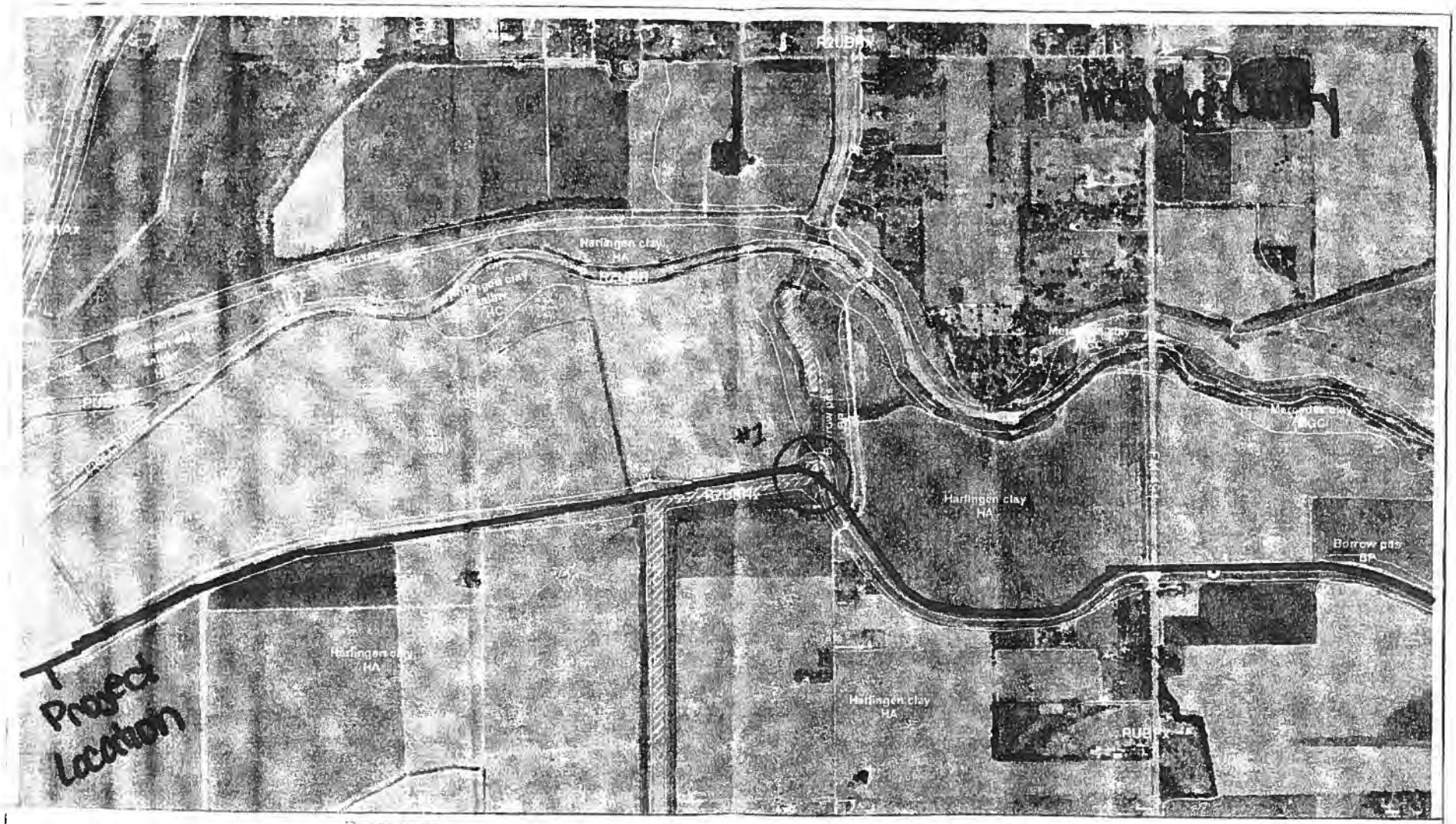
Source
1. Aerial: National Geospatial Intelligence Agency (2009).
2. Soils, USDA- NRCS SSURGO Database
Hidalgo County, Texas
3. Wetlands: USDOI-USFWS National Wetland Inventory (2010).

**FIGURE 2**
**Soils Map**
**Sheet 1 of 7**

Arroyo Colorado South Levee

International Boundary and Water Commission
United States Section

SWG-2010-00333
Pg 2 of 8




N

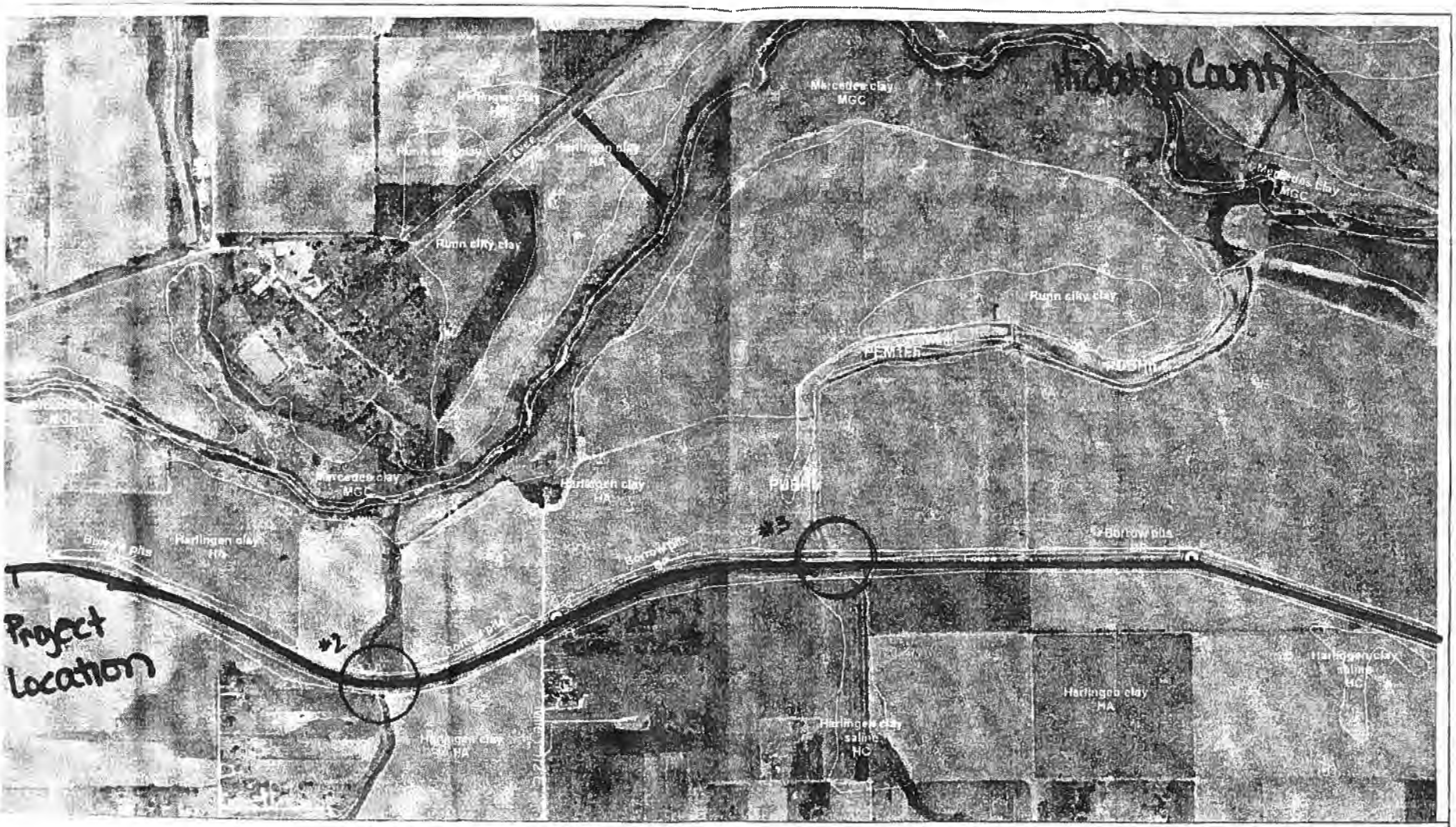
Miles
0 0.1 0.2 0.3

Mile Markers
Soil Boundary
Survey Area
Drainage Ditch
Irrigation Canal
Freshwater Emergent Wetland
Freshwater Pond
Lake
Riverine

Source 1. Aerial; National Geospatial Intelligence Agency (2009).
2. Soils; USDA- NRCS SSURGO Database
Hidalgo County, Texas
3. Wetlands; USDOI-USFWS National Wetland Inventory (2010).

**FIGURE 3**
**Soils Map**
**Sheet 2 of 7**
Arroyo Colorado South Levee
International Boundary and Water Commission
United States Section

SWG-2010-00333
Pg 3 of 8




Mile Markers
Soil Boundary
Survey Area
Drainage Ditch
Freshwater Emergent Wetland
Freshwater Pond
Lake
Riverine

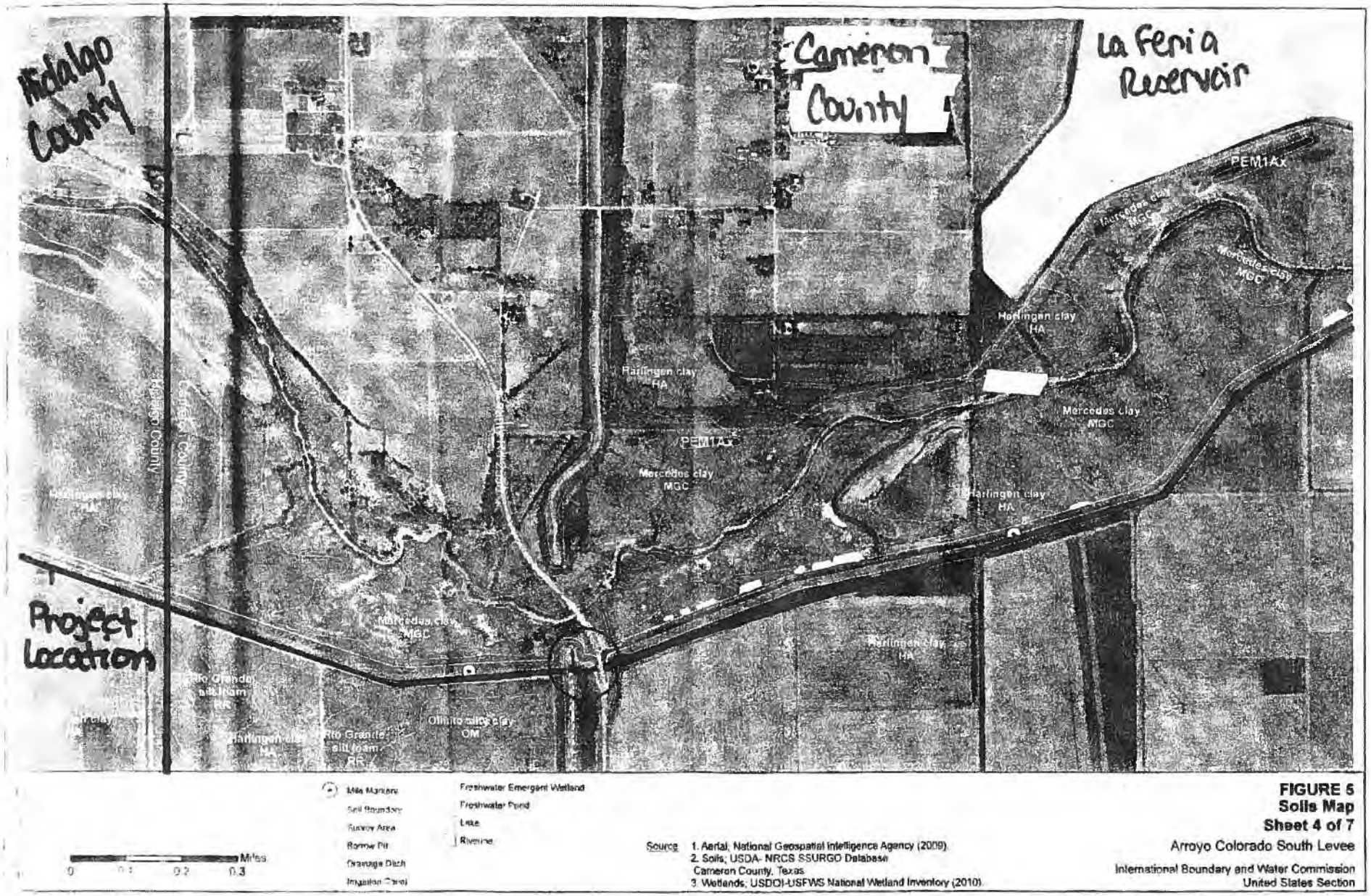
0 0.1 0.2 0.3 Miles

Source: 1. Aerial, National Geospatial Intelligence Agency (2009).
2. Soils: USDA- NRCS SSURGO Database
Hidalgo County, Texas
3. Wetlands. USDOI-USFWS National Wetland Inventory (2010)

**FIGURE 4**
**Soils Map**
**Sheet 3 of 7**
**Arroyo Colorado South Levee**

International Boundary and Water Commission
United States Section

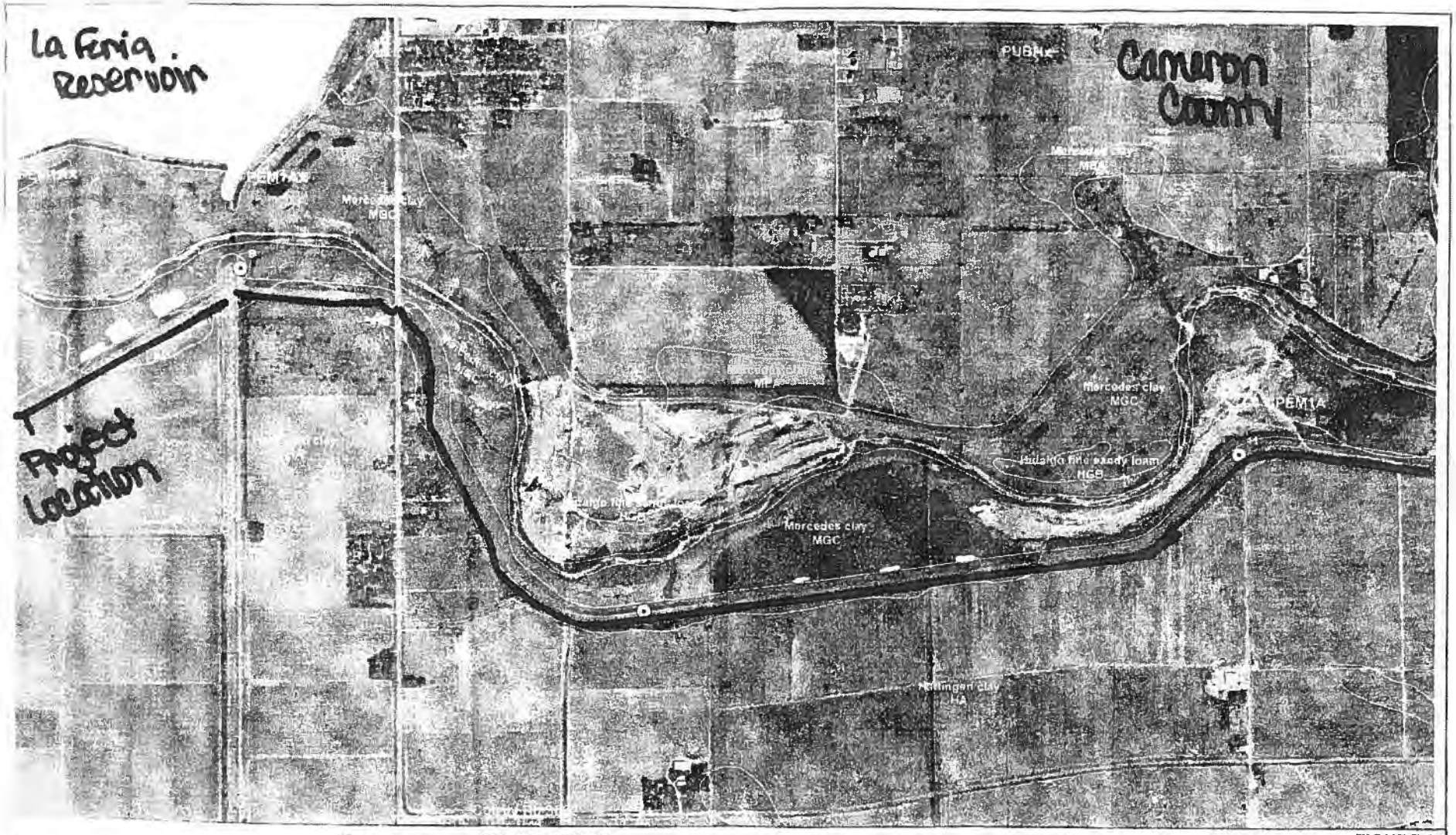
SWG-2010-00333
Pg 4 of 5




Source: 1. Aerial, National Geospatial Intelligence Agency (2009).
2. Soils; USDA- NRCS SSURGO Database
Cameron County, Texas
3. Wetlands; USDOI-USFWS National Wetland Inventory (2010).

**FIGURE 5**
**Soils Map**
**Sheet 4 of 7**
Arroyo Colorado South Levee
International Boundary and Water Commission
United States Section

SWG-2010-00333
Pg 5 of 8




Mile Markers
Soil Boundary
Survey Area
Borrow Pit
Drainage Ditch
Irrigation Canal
Freshwater Emergent Wetland
Freshwater Pond
Lake
Riverine

Miles
0 3

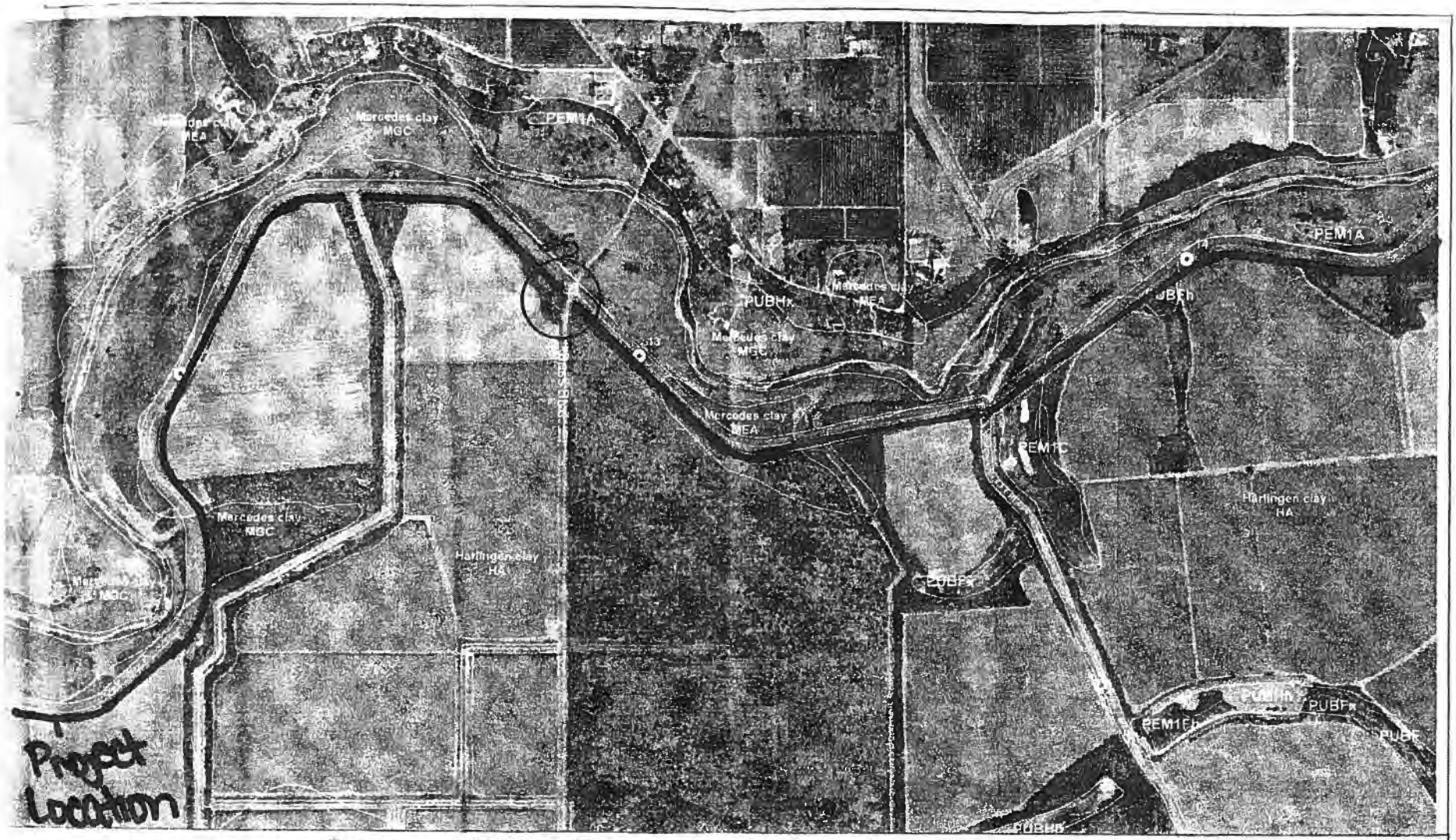
Source: 1. Aerial, National Geospatial Intelligence Agency (2009).
2. Soils: USDA- NRCS SSURGO Database
Cameron County, Texas
3. Wetlands: USDOI-USFWS National Wetland Inventory (2010)

**FIGURE 6**
**Soils Map**
**Sheet 5 of 7**

Arroyo Colorado South Levee

International Boundary and Water Commission
United States Section

SWG-2010-00333
Pg 6 of 8



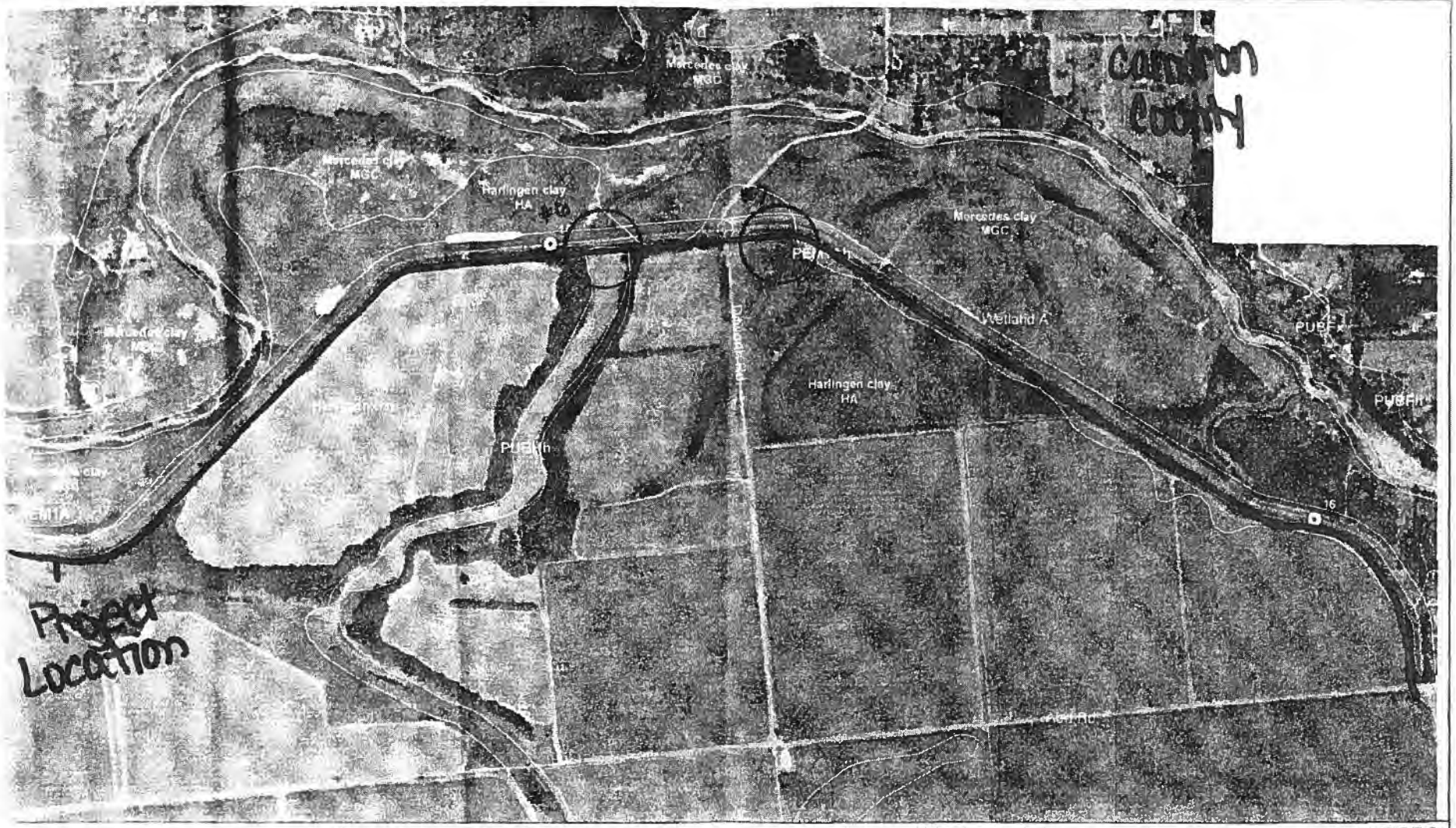

Mile Markers
Soil Boundary
Survey Area
Borrow Pit
Drainage Ditch
Irrigation Canal
Freshwater Emergent Wetland
Freshwater Pond
Lake
Riverine

0 0.1 0.2 0.3 Miles

Source
1. Aerial: National Geospatial Intelligence Agency (2009).
2. Soils: USDA- NRCS SSURGO Database Cameron County, Texas
3. Wetlands: USDOI-USFWS National Wetland Inventory (2010)

**FIGURE 7**
**Soils Map**
**Sheet 6 of 7**
Arroyo Colorado South Levee
International Boundary and Water Commission
United States Section

SWG-2010-00333
Pg 7 of 8




Mile Markers
Roll Boundary
Survey Area
Borrow Pit
Drainage Ditch
Irrigation Canal
Wetland A
Freshwater Emergent Wetland
Freshwater Pond
Lake
Riverine

Miles
0 0.1 0.2 0.3

N

Source
1. Aerial: National Geospatial Intelligence Agency (2009).
2. Soils: USDA- NRCS SSURGO Database
Cameron County Texas
3. Wetlands: USDOI-USFWS National Wetland Inventory (2010)

**FIGURE 8**
**Soils Map**
**Sheet 7 of 7**

Arroyo Colorado South Levee

International Boundary and Water Commission
United States Section

SLOG-2010-00333
Pg 8 of 8

## NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

| Applicant: IBWC | | Permit: SWG-2010-00333 | Date: 25 May 2010 |
|---|---|---|---|
| Attached is: | | | See Section below |
| | INITIAL PROFFERED PERMIT (Standard Permit or Letter of Permission) | | A |
| | PROFFERED PERMIT (Standard Permit or Letter of Permission) | | B |
| | PERMIT DENIAL | | C |
| X | APPROVED JURISDICTIONAL DETERMINATION | | D |
| | PRELIMINARY JURISDICTIONAL DETERMINATION | | E |

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/inet/functions/cw/cecwo/reg/ or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

  OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved jurisdictional determination (JD) or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

## SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

## POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

| | |
|---|---|
| If you have questions regarding this decision and/or the appeal process you may contact:<br>Lloyd Mullins, Leader<br>U.S. Army Corps of Engineers<br>Corpus Christi Regulatory Field Office<br>5151 Flynn Parkway, Suite 306<br>Corpus Christi, Texas 78411-4318<br>Telephone: 361-814-5851 | If you only have questions regarding the appeal process you may also contact:<br>**Elliot N. Carman, Appeal Review Officer**<br>**CESWD-PDS-O, 1100 Commerce Street**<br>**Suite 831**<br>**Dallas, Texas 75242-1317**<br>**Telephone: 469-487-7037; FAX 469-487-7199** |

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

| | | |
|---|---|---|
| _____<br>**Signature of appellant or authorized agent.** | Date: | Telephone number: |

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

OFFICE OF THE COMMISSIONER
UNITED STATES SECTION

April 26, 2010

Mr. Mark Wolfe, State Historic Preservation Officer
Texas Historical Commission
Attn: Debra Beene
Project Review Coordinator
P.O. Box 12276
Austin, TX 78711-2276

**Subject: STIMULUS-Request for Consultation under Section 106 of the National Historic Preservation Act and submission of Draft Environmental Assessment and Cultural Resources Survey Report for flood control improvements along the Arroyo Colorado South levee located in Hidalgo and Cameron Counties, Texas.**

Dear Mr. Wolfe:

The United States Section of the International Boundary and Water Commission (USIBWC) proposes to conduct flood control improvements along the Arroyo Colorado South Levee System (ACS) located in Hidalgo and Cameron Counties, Texas. The ACS is a component of the Lower Rio Grande Flood Control Project that conveys floodwater diverted from the Rio Grande to the Laguna Madre in the Gulf of Mexico and protects urban, suburban, and highly developed irrigated farmland along the Rio Grande delta in the United States and Mexico.

The USIBWC has identified levee height deficiencies in various locations along the ACS. To increase flood containment capacity, fill material would be added to the top of the existing 16-mile long earthen levee system to increase the levee height to its original design specifications or to meet current flood control requirements. Various sections of the levee system along the ACF would be raised to a minimum three (3) feet high freeboard, the difference between the top of the levee or floodwall and the designed water elevation. Height increases would result in expansion of the levee footprint up to a maximum of eighteen (18) feet on each side of the levee, to retain current slope design values. The expansion would take place on both sides of the existing levee entirely within the USIBWC right-of-way. The Area of Potential Effect (APE) for this project consists of 100 feet from the centerline of the levee.

The cultural resources data were obtained from field surveys, site file searches using the Texas Historical Commission's Restricted Cultural Resources Information, the Texas Archeological Sites Atlas, and various archival resources. The archeological field investigation included six (6) High Probability Areas previously identified in the cultural resources workplan and subsequently approved by the THC on March 15, 2010. There were no archeological resources identified within the APE during the course of this investigation. However, 83 architectural resources were identified. Of these, 10 are potentially eligible for individual listing in the National Register of Historic Places (NRHP), while 56 are not individually eligible but would be considered contributing elements of a historic district. The 17 remaining resources were deemed nonhistoric

The Commons, Building C, Suite 310 • 4171 N. Mesa Street • El Paso, Texas 79902
(915) 832-4100 • (FAX) (915) 832-4190 • http://www.ibwc.state.gov

or lacking sufficient integrity and, thus, ineligible for NRHP either as an individual property or as a contributing element of a historic district.

USIBWC is aware that Native American and other cultural groups may have concerns related to cultural resources, so consultation will also be conducted with the following groups:

- Comanche Nation
- Kiowa Tribe of Oklahoma

With this letter, the USIBWC is submitting a Draft Environmental Assessment (EA) document that addresses potential impacts to environmental and socioeconomic conditions and a cultural resources investigations report that addresses impacts to archeological and architectural resources by the proposed undertaking. The Draft EA serves as the Determination of Effect for this undertaking in accordance with 36 CFR 800.8 and is being submitted to your office for review and concurrence under Section 106 of the National Historic Preservation Act. We welcome your comments on this undertaking and look forward to addressing any concerns your office may have. If you have any questions or concerns, please contact, Lisa Santana at (915) 832-4707 or by emailing lisa.santana@ibwc.gov.

Sincerely,

Daniel Borunda
Acting Division Chief
Environmental Management Division

Attachment:

One (1) copy of Draft Environmental Assessment: Improvements to the Arroyo Colorado South Levee, Hidalgo and Cameron Counties, Texas

Two Copies (2) of Cultural Resource Reconnaissance and Intensive Survey for the Improvements to the Arroyo Colorado South Levee in Hidalgo and Cameron Counties, Texas by Matchen et al.

**TEXAS HISTORICAL COMMISSION**
*real places telling real stories*

May 25, 2010

Daniel Borunda
Acting Division Chief
Environmental Management Division
International Boundary and Water Commission
The Commons, Building C, Suite 310
4171 N. Mesa Street
El Paso, TX 79902

Re: *Project review under Section 106 of the National Historic Preservation Act of 1966*
***Draft Environmental Assessment and Cultural Resource Reconnaissance and Intensive Survey for Improvements to the Arroyo Colorado South Levee,*** *Cameron and Hidalgo Counties, Texas*
*(IBWC; THC Track #201011083)*

Dear Mr. Borunda,

Thank you for your correspondence dated April 26, 2010 concerning the above referenced project. This letter serves as comment on the proposed undertaking from the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission.

THC review staff has completed its review of the project documentation provided and has the following comments. The Arroyo Colorado Floodway Project, as a whole, was previously determined eligible for listing in the National Register of Historic Places under Criterion A for Government/Public Works and Criterion C for Engineering at the local level of significance.

It is our understanding that the proposed undertaking is intended to provide adequate flood control, and consists of increasing the height of the existing earthen levees by up to six feet over approximately 16 miles of levees; the levee footprint would expand by a maximum of 18 feet. Most of the height increases will be centered so that the footprint extension is equal on either side of the levee. Where a centered expansion is not possible due to the presence of irrigation structures or other constraints, the levee expansion will be offset. Based on this understanding and the condition that the only resource that will be physically impacted by the work is the levee itself, we have determined that the proposed undertaking will have **no adverse effect** on historic resources.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this federal review process, and for your efforts to preserve the irreplaceable heritage of Texas. **If you**

**have any questions concerning our review or if we can be of further assistance, please contact Kim Barker at 512/463-8952.**

Sincerely,

Kim Barker, Project Reviewer
for: Mark Wolfe, State Historic Preservation Officer

cc: Mary Torres, Chair, Cameron County Historical Commission
Adela Ortega, Chair, Hidalgo County Historical Commission

MW/KB

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

OFFICE OF THE COMMISSIONER
UNITED STATES SECTION

April 26, 2010

Ernesto Reyes
U.S. Fish and Wildlife Service
Ecological Services
Route 2, Box 202-A
Alamo, Texas 78516

Subject: Initiation of Informal Consultation under Section 7 of the Endangered Species Act to conduct flood control improvements along the Arroyo Colorado South levee located within Hidalgo and Cameron Counties, Texas

Dear Mr. Reyes:

The United States Section of the International Boundary and Water Commission (USIBWC) has prepared an Environmental Assessment (EA) for proposed flood control improvements along the south levee of the Arroyo Colorado Floodway system in order to address the 100-year flood protection criteria established by the Federal Emergency Management Agency.

Please find enclosed the EA including a detailed description of the proposed project along with maps of the area. The Preferred Alternative consists of raising the Arroyo Colorado south levee (ACS) height for 16 miles to increase the flood containment capacity. The Preferred Alternative would require clearing vegetation along 16 miles of the ACS. Vegetation removal would occur on the levee slopes and adjacent, narrow strips of land for expansion where fill would be added. The USIBWC anticipates a phased implementation approach for the Preferred Alternative.

Fifteen federally listed threatened or endangered species were identified as occurring within Hidalgo and Cameron counties. USIBWC has determined that eleven of those species would not be affected by the Preferred Alternative because each species and its habitat are located outside the project area. These include the west Indian manatee (*Trichechus manatus*), Atlantic hawksbill sea turtle (*Eretmochelys imbricate*), green sea turtle (*Chelonia mydas*), Kemp's ridley sea turtle (*Lepidochelys kempii*), leatherback sea turtle (*Dermochelys coriacea*), loggerhead sea turtle (*Caretta caretta*), brown pelican (*Pelecanus occidentalis*), star cactus (*Astrophytum asterias*), and Walker's manioc (*Manihot walkerae*).

Six federally listed threatened or endangered species were determined to be potentially impacted by the Preferred Alternative. These include the northern aplomado falcon (*Falco femoralis septentrionalis*), piping plover (*Charadrius melodus*), jaguarundi (*Herpailurus yaguarondi*), ocelot (*Leopardus pardalis*), south Texas ambrosia (*Ambrosia cheiranthifolia*), and Texas ayenia (*Ayenia limitaris*).

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A field reconnaissance survey was conducted by TRC Environmental Corporation on February 22 through 26, 2010, to assess habitat suitability for threatened and endangered species in the project area. No threatened or endangered species were observed during the field survey. Detailed description of the vegetation communities and threatened and endangered species potentially impacted by the Preferred Alternative are included in the Biological Evaluation (Appendix B) of the EA.

Construction impacts from the Preferred Alternative would be temporary, localized, and subject to the best management practices outlined in the EA. There would be no change in routine maintenance activities associated with the Preferred Alternative. Due to the lack of suitable habitat and the temporary nature of the impacts, the USIBWC has determined that construction and operation of the Preferred Alternative would not likely adversely affect the six federally listed species.

USIBWC therefore requests your concurrence with this determination. Thank you for your timely assistance in this matter. We welcome your comments on this undertaking and look forward to addressing any concerns your office may have. Please submit your comments so they are postmarked by May 26, 2010. If you have any questions or concerns, please contact Lisa Santana at (915) 832-4707 or by emailing lisa.santana@ibwc.gov

Sincerely,

Daniel Borunda
Acting Division Chief
Environmental Management Division

**United States Department of the Interior**
**FISH AND WILDLIFE SERVICE**
Ecological Services - LRGV SubOffice
Phone: (956) 784-7560 Fax: (956) 787-0547
Rt. 2 Box 202-A
Alamo, TX 78516
May 18, 2010

Lisa Santana
Natural Resource Specialist
Environmental Management Division, USIBWC
4171 N. Mesa, c-100
El Paso, Texas 79902

Consultation No. 21410-2010-TA-00298

Dear Mr. Borunda:

This responds to a letter received on April 26, 2010 regarding the effects of the proposed flood control improvements on species federally listed or proposed for listing as threatened or endangered occurring within Hidalgo and Cameron Counties, Texas. In addition, your project was evaluated with respect to wetlands and other important fish and wildlife resources.

It's the Service's understanding that U.S. International Boundary and Water Commission (USIBWC) proposes to conduct flood control improvements along the Arroyo Colorado South levee located in Hidalgo and Cameron Counties. Initial hydraulic modeling of the Arroyo Colorado System (ACS) indicates that the westernmost 3 miles of the levee do not meet FEMA flood protection criteria. The hydraulic evaluation indicated that an increase in levee height, up to 6 feet, would be necessary in a number of sections of the ACS to meet design criteria for flood protection.

To raise the levee, fill material obtained from commercial sources outside the levee system would be added to the existing levee to bring the height to its original specifications or to meet a 3-foot freeboard design criterion. The need for excavation outside the levee structure is not anticipated. Up to 6 feet of fill material would be placed on top of the levee, extending the levee footprint up to a maximum of 18 feet from the current toes of the levee. In some reaches of the levee system, if required by the presence of irrigation structures or other constraints, expansion would be made with an offset centerline, placing the additional footprint on only one side of the levee. If the option to offset is selected, the levee slope can be changed from a 3:1 to a 2.5:1 slope. Foot print expansion would occur entirely within the ACS ROW. The preferred Alternative consists of raising the levee height for the entire 16 miles to increase the flood containment capacity of the ACS.

The levee construction activities would affect approximately 312 acres of vegetation along the entire ACS project area through vegetation removal and fill activities. Under Alternative 2, the vegetation communities/habitat types impacted would include the non-native grass-covered slopes of the existing levee (147 acres), adjacent rangeland (35 acres), agriculture land (36 acres), woodland/thornscrub (20 acres; including the LRGVNWR tract near levee mile 13 (9 acres), borrow pits (2 acres), old-field communities (0.8 acres), a non-jurisdictional wetland (0.1 acre), and riparian vegetation associated with the de facto wildlife travel corridor (66 acres), LRGVNWR tract near levee mile 7 (1 acre, drainage ditches (0.9 acre), irrigation canals (3.5 acres), pond (0.2 acre).

One of our major concerns is the impacts of 0.6 acres of woodland/thornscrub on the Resaca de Los Fresnos Refuge tract along mile 13. Our recommendation would be to offset the levee toward the Arroyo Colorado (northward) due to the difference in habitat quality on the north (primarily mesquite trees) of the levee versus the south side which is comprised of high quality thornscrub habitat suitable for the endangered ocelot, and jaguarundi. Please contact Bryan Winton (LRGVNWR Refuge Manager) at (956) 784-7521 if habitat needs to be removed, particularly on the south side of the Resaca de Los Fresnos Tract, and would appreciate an opportunity to meet with IBWC and/or the selected contractors for this project, prior to any habitat clearing activities.

Another recommendation to minimize impacts to the rest of the woodland/thornscrub vegetation would be to offset the levee footprint away from the vegetation (the opposite side of the levee) and even have a 2.5:1 slope to reduce the footprint of the expansion for these areas of concern including the non-jurisdictional wetland, and the de facto wildlife travel corridor.

The removal of trees and clearing of the ROW would be conducted outside of the migratory bird breeding season or the ROW would be surveyed by a qualified environmental biologist for active nests prior to construction to ensure the preservation of the nests. If nests are found during the survey, construction would not occur in the vicinity until the offspring fledge or the nest fails or is abandoned.

Some Best Management Practices would include fill material placement and levee footprint expansion activities that are to occur along USFWS LRGVNWR tracts and the de facto wildlife corridor would occur in close coordination with the USFWS to develop measures to minimize impacts to these areas. These measures may include, but are not limited to, removal of vegetation during non-breeding seasons, selective vegetation removal, revegetation with native trees or shrubs, and avoidance. Revegetation with native herbaceous species would be implemented after construction is completed along the expanded levee and any required construction corridor. Native vegetation species to be used in reclamation would be determined through coordination with the USFWS and the TPWD. A qualified environmental monitor would be provided to survey for federally listed species to ensure the prevention of direct or indirect take of any listed species.

We appreciate the opportunity to provide pre-planning information and look forward to providing any further assistance. Once the additional site specific information is received we can review your determinations of effects to each species and determine if other avoidance measures would be recommended.

If we can be of further assistance, please contact Ernesto Reyes at the above letterhead and telephone number.

Sincerely,

Ernesto Reyes Jr.

Ernesto Reyes Jr.
Senior Fish & Wildlife Biologist
For
Allan M. Strand
Field Supervisor

cc:
Field Supervisor, U.S. Fish and Wildlife Service, Corpus Christi, TX
Bryan Winton, LRGVNWR Refuge Manager, Alamo, Texas

**U.S. Fish and Wildlife Service**

**Lower Rio Grande Valley National Wildlife Refuge**
**Route 2 Box 202A**
**Phone (956) 784-7500 Alamo, TX 78516 Fax (956) 787-8338**

5-18-2010

Ms. Lisa Santana
Natural Resources Specialist
Environmental Management Division, USIBWC
4171 North Mesa, C-100
El Paso, Texas 79902

Ms. Santana:

Enclosed are my comments and recommendations for the work proposed in the "Draft Environmental Assessment: Improvements to the Arroyo Colorado South Levee, Hidalgo and Cameron Counties, Texas", as they could potentially negatively affect lands I am responsible for as part of the Lower Rio Grande Valley National Wildlife Refuge—one of three U.S. Fish & Wildlife Service refuges present in the three southern counties in south Texas.

The Lower Rio Grande Valley National Wildlife Refuge is comprised of ~135 separate parcels of land that protect remaining habitat fragments between Falcon Dam in Starr County and Boca Chica, Cameron County. The purpose of the refuge is to provide a vegetative corridor for benefit of endangered species, like ocelot and jaguarondi, and migratory birds, to include resident species of all types. The project, as currently proposed, to perform levee improvements will affect two tracts owned and/or managed by the refuge. The comments I have regarding the work in and adjacent to these two tracts should not pose a significant problem with the project as planned. My comments merely request that if and when at all possible that vegetative impacts associated with these two refuge tracts be avoided and or at least minimized in order to preserve the values the refuge seeks to maintain.

To simplify my comments I will reference the figures provided in the document. Figure A-3 depicts the Willacy Canal and shows that the levee improvements will cross this area. Under a management agreement with the Delta Lake Irrigation District, the U.S. Fish & Wildlife Service manages this canal system from the Rio Grande to Delta Lake, to include its adjacent vegetation for purposes of providing a habitat linkage between the Rio Grande to areas north of Expressway 83. This area serves as the sole site where mammalian wildlife can safely move northward beneath the expressway with the benefits of vegetative cover. Elsewhere in the three southern counties of Texas, there is absolutely no opportunity for terrestrial animals to move safely across Expressway 83. Therefore, we request that you take into consideration the importance of

maintaining this continuous vegetative link that crosses FM 2556. I do not anticipate this request will have an overly negative effect on your current levee-raising plans for the Willacy Canal area, since there is minimal vegetative cover in this area currently. Nonetheless, please take this into consideration since existing sparse vegetation is thus even more valuable in this area in order to maintain the vegetative corridor.

Figure A-4 depicts our Resaca de Los Fresnos Tract where ~0.6 miles of levee work will traverse our property. I toured this levee segment on April 28, 2010 and observed the vegetative structure currently present on each side of the levee. I have significant concerns for the levee work needed at this site. My concern is that the work may be extremely challenging to perform without some vegetation removal along this segment. If indeed vegetation removal is unavoidable, I recommend that the levee be raised disproportionately toward the Arroyo Colorado (northward). I am recommending this approach in this segment due to the vast difference in habitat quality on the north (primarily mesquite trees) of the levee versus the south side—which is comprised of a wide variety of high quality habitat suitable for endangered ocelot. In addition, there is considerably more open area on the north side of the levee (as compared to the south side) which may enable the levee work to occur without any vegetation removal, which would be our preference. If you would like to discuss this matter more specifically, please do not hesitate to call me for further clarification when you are compiling public comments to the Draft EA.

I am thankful for the opportunity to comment on the proposed project. There are two tracts we manage that could potentially be negatively affected by the levee-raising work. If precautions can be made to avoid habitat removal while still accomplishing the necessary levee improvements, we can fully support this project. If habitat will need to be removed, particularly on the south side of our Resaca de Los Fresnos Tract, we would appreciate an opportunity to meet with IBWC and/or the selected contractors for this project, prior to any habitat clearing activities. Please call me with any questions or for further clarification or comment at (956) 784-7521.

Sincerely,

Bryan R. Winton
Refuge Manager

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

OFFICE OF THE COMMISSIONER
UNITED STATES SECTION

April 26, 2010

Chairman Michael Burgess
Comanche Nation
P.O. Box 908
Lawton, Oklahoma 73502-0908

Subject: Request for Consultation under Section 106 of the National Historic Preservation Act for flood control improvements along the Arroyo Colorado South levee located in Hidalgo and Cameron Counties, Texas

Chairman Burgess:

The United States Section, International Boundary and Water Commission, United States and Mexico (USIBWC) invite the Comanche Nation to review and comment on the Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI) on the Improvements to the Arroyo Colorado South Levee in Hidalgo and Cameron Counties, Texas. The EA evaluates environmental effects that may result from the proposed expansion of the Arroyo Colorado South Levee system in order to address the 100-year flood protection criteria established by the Federal Emergency Management Agency.

In addition, please find enclosed the *Cultural Resource Reconnaissance and Intensive Survey for the Improvements to the Arroyo Colorado South Levee in Hidalgo and Cameron Counties, Texas* report for your review and comment. There were no archeological resources identified within the project area during the course of this investigation.

The Draft EA serves as the Determination of Effect for this undertaking in accordance with 36 CFR 800.8 and is being submitted to the Comanche Nation for review and concurrence under Section 106 of the National Historic Preservation Act. The USIBWC welcomes your comments on this undertaking and look forward to addressing any concerns the Comanche Nation may have. If you have any questions or concerns, please contact, Lisa Santana at (915) 832-4707 or by emailing lisa.santana@ibwc.gov.

Sincerely,

Daniel Borunda
Acting Division Chief
Environmental Management Division

Attachment:
As stated

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INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

OFFICE OF THE COMMISSIONER
UNITED STATES SECTION

April 26, 2010

Chairman Donald Tofpi
Kiowa Tribe of Oklahoma
P.O. Box 369
Carnegie, Oklahoma 73015-0369

Subject: Request for Consultation under Section 106 of the National Historic Preservation Act for flood control improvements along the Arroyo Colorado South levee located in Hidalgo and Cameron Counties, Texas

Chairman Tofpi,

The United States Section, International Boundary and Water Commission, United States and Mexico (USIBWC) invite the Kiowa Tribe of Oklahoma to review and comment on the Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI) on the Improvements to the Arroyo Colorado South Levee in Hidalgo and Cameron Counties, Texas. The EA evaluates environmental effects that may result from the proposed expansion of the Arroyo Colorado South Levee system in order to address the 100-year flood protection criteria established by the Federal Emergency Management Agency.

In addition, please find enclosed the *Cultural Resource Reconnaissance and Intensive Survey for the Improvements to the Arroyo Colorado South Levee in Hidalgo and Cameron Counties, Texas* report for your review and comment. There were no archeological resources identified within the project area during the course of this investigation.

The Draft EA serves as the Determination of Effect for this undertaking in accordance with 36 CFR 800.8 and is being submitted to the Kiowa Tribe of Oklahoma for review and concurrence under Section 106 of the National Historic Preservation Act. The USIBWC welcomes your comments on this undertaking and look forward to addressing any concerns the Kiowa Tribe of Oklahoma may have. If you have any questions or concerns, please contact, Lisa Santana at (915) 832-4707 or by emailing lisa.santana@ibwc.gov.

Sincerely,

Daniel Borunda
Acting Division Chief
Environmental Management Division

Attachment:
As stated

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INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

OFFICE OF THE COMMISSIONER
UNITED STATES SECTION

October 20, 2010

Mr. Ernesto Reyes
U.S. Fish and Wildlife Service
Ecological Services
Route 2, Box 202-A
Alamo, Texas 78516

Subject: Response to Comments and Initiation of Consultation under Section 7 of the Endangered Species Act to conduct flood control improvements along the Arroyo Colorado South Levee located within Hidalgo and Cameron Counties, Texas

Dear Mr. Reyes:

In response to the U.S. Fish and Wildlife Service's (USFWS) technical assistance letter dated May 18, 2010, the United States Section of the International Boundary and Water Commission (USIBWC) has revised the draft Environmental Assessment submitted to your office on April 26, 2010. The locations of revisions to the attached final Environmental Assessment (EA) are detailed below.

- Section 1.3.2 – Levee System Description
- Section 2 – Levee Improvements Proposed under Alternatives 1 and 2
- Section 2.2 – Alternative 1
- Section 2.3 – Alternative 2
- Table 2-1 – Summary of Environmental Impacts
- Section 3.1.1 – Vegetation
- Section 3.1.2 – Wetlands
- Section 3.1.3 – Wildlife
- Section 3.1.4 – Threatened and Endangered Species
- Section 3.4.1 – Natural Resource Management Areas
- Section 4.2 – Best Management Practices – Natural Resources

The Preferred Alternative consists of raising the Arroyo Colorado south levee (ACS) height for 16 miles to increase the flood containment capacity. The Preferred Alternative would require clearing vegetation along 16 miles of the ACS. Vegetation removal would occur on the levee slopes and adjacent, narrow strips of land for expansion where fill would be added.

However, in order to minimize impacts, the riverside edge of the existing de facto wildlife corridor would serve as the limits of construction for the landside of the levee, to the maximum extent practicable. Any construction within the de facto wildlife corridor would be coordinated with the USFWS and no trees within the de facto wildlife corridor would be cleared without prior approval of the USFWS. In addition, no construction activities would occur within the Lower Rio Grande National Wildlife Refuge (LRGNWR) tract near levee mile 7. Construction activities along the LRGNWR tract near levee mile 13 would be limited to the riverside of the levee only. As with the de facto wildlife corridor, all construction activities within the LRGNWR tract would be coordinated with the USFWS. The USIBWC anticipates a phased implementation approach for the Preferred Alternative.

Fifteen federally listed threatened or endangered species were identified as occurring within Hidalgo and Cameron counties. USIBWC has determined that eleven of those species would not be affected by the Preferred Alternative because each species and its habitat are located outside the project area. These include the west Indian manatee (*Trichechus manatus*), Atlantic hawksbill sea turtle (*Eretmochelys imbricate*), green sea turtle (*Chelonia mydas*), Kemp's ridley sea turtle (*Lepidochelys kempii*), leatherback sea turtle (*Dermochelys coriacea*), loggerhead sea turtle (*Caretta caretta*), brown pelican (*Pelecanus occidentalis*), star cactus (*Astrophytum asterias*), and Walker's manioc (*Manihot walkerae*).

Six federally listed threatened or endangered species were determined to be potentially impacted by the Preferred Alternative. These include the northern aplomado falcon (*Falco femoralis septentrionalis*), piping plover (*Charadrius melodus*), jaguarundi (*Herpailurus yaguarondi*), ocelot (*Leopardus pardalis*), south Texas ambrosia (*Ambrosia cheiranthifolia*), and Texas ayenia (*Ayenia limitaris*).

A field reconnaissance survey was conducted by TRC Environmental Corporation on February 22 through 26, 2010, to assess habitat suitability for threatened and endangered species in the project area. No threatened or endangered species were observed during the field survey. Detailed description of the vegetation communities and threatened and endangered species potentially impacted by the Preferred Alternative are included in the Biological Evaluation (Appendix B) of the EA.

Construction impacts from the Preferred Alternative would be temporary, localized, and subject to the best management practices outlined in the EA. There would be no change in routine maintenance activities associated with the Preferred Alternative. Due to the lack of suitable habitat impacted and the temporary nature of the impacts, the USIBWC has determined that construction and operation of the Preferred Alternative would not likely adversely affect the six federally listed species.

USIBWC therefore requests your concurrence with this determination. Thank you for your timely assistance in this matter. If you have any questions or concerns, please contact Lisa Santana at (915) 832-4707 or by emailing lisa.santana@ibwc.gov

Sincerely,

Wayne Belzer
Acting Division Chief
Environmental Management Division

**United States Department of the Interior**
**FISH AND WILDLIFE SERVICE**
Ecological Services - LRGV SubOffice
Phone: (956) 784-7560 Fax: (956) 787-8338
Rt. 2 Box 202-A
Alamo, TX 78516
November 5, 2010

Wayne Belzer
Acting Division Chief, Environmental Management Division
U.S. International Boundary and Water Commission
The Commons Building C, Suite 31
4171 N. Mesa Street
El Paso, Texas 79902

Consultation No. 21410-2010-I-0298

Dear Mr. Belzer:

This responds to a letter received on October 20, 2010 regarding the effects of the proposed flood control improvements along the Arroyo Colorado South Levee on species federally listed or proposed for listing as threatened or endangered occurring within Hidalgo and Cameron County, Texas. In addition, your project was evaluated with respect to wetlands and other important fish and wildlife resources.

It's the Service's understanding that the U.S. International Boundary and Water Commission (IBWC) propose to improve the Arroyo Colorado South Levee System (ACS) to address the 100 year flood protection criteria established by FEMA. To raise the levee, fill material obtained from commercial sources outside the levee system would be added to the existing levee to bring the height to its original design specifications or to meet a 3-foot freeboard design criterion. The need for excavation outside the levee structure is not anticipated. A maximum of 6 feet of fill material would be placed on top of the levee. Typically, as the levee height is increased, the footprint would expand within the USIBWC ROW. However, in order to minimize footprint expansion due to raising the levee, both landside and riverside slopes would be steepened up to 2.5:1. In some reaches of the levee system, if required by the presence of irrigation structures or other constraints, expansion would be made with an offset centerline, placing the additional footprint on only one side of the existing levee. **Figure 2-1: Typical Cross section of a Levee Illustrating Footprint Expansion** drawing needs to be corrected on the side slopes on both sides to 2.5:1 instead of 3:1 and 4:1.

On September 7, 2010, a meeting was held between the Service, IBWC and Tetra Tech to discuss modifications to the levee raising to minimize the impacts to the Refuge tracts and de facto wildlife corridor. The delineated wildlife corridor and refuge areas were overlaid onto the plans and used as a reference in the design. The wildlife corridor is located on the landside of the levee, throughout the entire levee reach. The northern edge of the wildlife corridor (edge nearest to the levee) is used as the design boundary, no proposed grading or vegetation removals will be permitted outside this boundary. The only exception is between Stations 10+00 to 17+00 within Hidalgo County.

Levee sideslopes on the landside would be steepened to 2.5:1, from the existing 5:1 side slopes. A new toe of the levee will be established based on the new 2.5:1 sideslope. The area from the new toe of slope to the edge of the wildlife corridor will provide a minimum 15 feet of buffer. This buffer strip will be used as an access road and seepage mitigation wells will be constructed adjacent to this new access road. Seepage wells (400 relieve wells) will be constructed per Geotechnical recommendation and spaced 40 to 100 feet apart, and would be required for the entire 16 miles of the levee. The wells would be located below grade and enclosed with a concrete vault. An outlet pipe will be required to drain the water from the wells into the wildlife corridor. A 6 to 12 inch PVC outlet pipe with a flap gate at the end will discharge into the wildlife corridor with rock riprap protection.

Other modifications to the levee would include construction of a 15-foot wide access road on both the riverside and the landside of the levee and widening of the levee crown to 16 feet where necessary. The riverside edge of the existing de facto wildlife corridor would serve as the limits of construction for the landside of the levee, to the maximum extent practicable. Any construction within the de facto wildlife corridor would be coordinated with the U.S. Fish and Wildlife Service (Service) and no trees within the de facto wildlife corridor would be cleared without prior approval of the Service. In addition, no construction activities would occur within the Lower Rio Grande Valley National Wildlife Refuge (LRGVNWR) tract near levee mile 7.

Construction activities along the LRGVNWR tract (Resaca de los Fresnos) near levee mile 13 would be limited to the riverside of the levee only. As per my phone conversation with Deborah Blackburn (Tetra Tech) on November 2, 2010, she went back and measured the distance from the proposed toe of the levee on the riverside of the Refuge out to the wooded vegetation line. It looks like the distance varies from 20 - 40 feet. Factoring in the 15 foot access road, that leaves anywhere from 5 to 25 feet to the wooded vegetation line. She provided a rough map that shows the edge of the standard construction corridor (red line) and a 15' buffer from the proposed levee toe (blue line); which in this case would represent the access road. The Service recommends minimal disturbance of the habitat on the Refuge riverside. The river-side portion of the refuge serves as a corridor for federally endangered ocelot and jaguarundi, and a suite of other wildlife. It constitutes thorn-shrubland/woodland, with species such as Vasey's adelia (Adelia vaseyi; state-ranked as S2S3, with very limited distribution in Texas), huaco (*Manfreda variegata*), twisted-rib cactus (*Echinocactus setispinus*), snake-eyes (*Phaulothamnus spinescens*), huisachillo (*Acacia schaffneri*), granjeno (*Celtis pallida*), mesquite (*Prosopis glandulosa*), lotebush (*Ziziphus obtusifolia*), leather-leaf (*Maytenus phyllanthoides*), and Berlandier's wolf-berry (*Lycium berlandieri*). Any habitat cleared that contains woodland/thornbrush vegetation community will be compensated at 3:1 for shrubland, woodland (ie for every acre removed or disturbed will be required) and 1:1 for riparian vegetation (de facto wildlife corridor) if vegetation removal is as shown in the Environmental Assessment as described on page 32 under Table 3-1.

| | | | |
|---|---|---|---|
| Direct land impacted : | 14.7 acres of woodland/thornscrub | x 3 | = 44.1 acres |
| : | 9.3 acres of riparian habitat | x 1 | = 9.3 acres |
| | | Total compensation | = 53.4 acres |

The Service believes that this acreage figure of compensation can be reduced considerably by minimizing impacts to the brushland and riparian communities and impacting only what is needed for the footprint of the project. Land of equal value will be compensated for this acreage by conservation easement, land acquisition, or monetary value.

As with the de facto wildlife corridor, all construction activities within the LRGVNWR tract would be coordinated with the USFWS. Footprint expansion would occur entirely within the ACS ROW. Structural improvements (e.g., seepage remediation) may be needed in some sections of the levee. These improvements would not contribute to footprint expansion of the current levee footprint. The delineated edge of the wildlife corridor and refuge are used as design boundaries and will be protected during construction by flagging and making the Contractor aware of the importance of these environmental sensitive areas. The Service recommends contacting the Lower Rio Grande Valley National Wildlife Refuge Manager (Bryan Winton) at (956) 784-7521 or Chris Hathcock (Wildlife Refuge Specialist) at (956) 784-7593 to meet the contractor on site before work begins to address these issues.

Regarding other important fish and wildlife resources, please keep in mind that many bird species protected under the Migratory Bird Treaty Act may nest in any area containing trees or other suitable habitat. As the Federal agency responsible for the protection of migratory birds, the Service recommends vegetation disturbances potentially associated with these activities avoid the general nesting period of March through August <u>or</u> that areas proposed for disturbance be surveyed first for nesting birds, in order to avoid the inadvertent destruction of nests, eggs, etc.

Your agency has made a "May Affect, Not Likely to Adversely Affect" determination for the ocelot and jaguarundi and The Service concurs with your determination with the above understanding. Based on your information of the project, the Service believes your agency has complied with Section 7(a)(2) of the Endangered Species Act by making that determination. We appreciate the opportunity to provide pre-planning information and look forward to providing any further assistance.

If we can be of further assistance, please contact Ernesto Reyes at the above letterhead and telephone number.

Sincerely,

Ernesto Reyes Jr.

Ernesto Reyes Jr.
Senior Fish & Wildlife Biologist
For
Allan M. Strand
Field Supervisor

cc:
Field Supervisor, U.S. Fish and Wildlife Service, Corpus Christi, TX
Dr. Lisa Santana, USIBWC, Natural Resource Specialist, El Paso, TX
Deborah Blackburn, Tetra Tech, Austin, TX
Bryan Winton, LRGV NWR Refuge Manager, Alamo, TX
Chris Hathcock, LRGV NWR Wildlife Refuge Specialist, Alamo, TX