Final Environmental Assessment

Alternatives for Improved Flood Control of the Hidalgo Protective Levee System

September 2005

Lead Agency:

United States Section,
International Boundary and
Water Commission

El Paso, Texas

Cooperating Agencies:

United States
Fish and Wildlife
Service

Texas
Parks and Wildlife
Department

Technical Support:

PARSONS

Austin, Texas

COVER SHEET

FINAL ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT

ALTERNATIVES FOR IMPROVED FLOOD CONTROL OF THE HIDALGO PROTECTIVE LEVEE SYSTEM

Lead Agency: United States Section, International Boundary and Water Commission

Cooperating Agencies: United States Fish and Wildlife Service
Texas Parks and Wildlife Department

Proposed Action: Raising the 4.5-mile Hidalgo Protective Levee System in south Texas to meet current requirements for flood control.

Report Designation: Environmental Assessment

Abstract:

The USIBWC is considering alternatives to raise the 4.5-mile Hidalgo Protective Levee System to meet current flood control requirements. Alternatives under consideration would raise levee height from 3 to 8 feet, depending on location, and expand the levee footprint by lateral extension of the structure. Levee footprint increases toward the riverside could potentially extend into the Lower Rio Grande Valley National Wildlife Refuge System. Footprint increases toward the levee landside could extend beyond the USIBWC right-of-way. Soil borrow easements would be used to secure levee material.

The Environmental Assessment assesses potential environmental impacts of the Proposed Action, the No Action Alternative, and two alternatives to the Proposed Action: the Phase 2 Footprint Expansion Alternative and the No-Footprint Expansion Alternative. The Proposed Action would be implemented in two phases. Phase 1 would raise existing levee height the along the 3.3-mile upstream reach of the levee system. Phase 2 would partially reroute the 1.2-mile downstream reach of the levee system to eliminate the need for construction of a floodwall in front of the Hidalgo Historic Pumphouse, a resource included in the National Register of Historic Places. A new levee segment, approximately 0.7 mile in length, would be built along the south margin of the pumphouse intake channel, and the channel would be crossed to tie the new structure to the existing levee system.

A Finding of No Significant Impact was issued for the Proposed Action Based on a review of the facts and analyses contained in the Environmental Assessment.

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Final Finding of No Significant Impact

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FINDING OF NO SIGNIFICANT IMPACT

ALTERNATIVES FOR IMPROVED FLOOD CONTROL OF THE HIDALGO PROTECTIVE LEVEE SYSTEM

AGENCY

United States Section, International Boundary and Water Commission (USIBWC); in cooperation with the U.S. Fish and Wildlife Service (USFWS) and the Texas Parks and Wildlife Department (TPWD).

BACKGROUND

The USIBWC is authorized to construct, operate and maintain any project or works projected by the United States of America on the Lower Rio Grande Flood Control Project (LRGFCP) as authorized by the Act of the 74th Congress, Sess. I Ch. 561 (H.R. 6453), approved August 19, 1935 (49 Stat. 660), and codified at 22 U.S.C. Section 277, 277a, 277b, 277c and Acts amendatory thereof and supplementary thereto. The LRGFCP was constructed to protect urban, suburban, and highly developed irrigated farmland along the Rio Grande delta in the United States and Mexico.

The Hidalgo Protective Levee System was recently identified as one of the LRGFCP priority areas for improvement as it does not meet current flood protection criteria. This 4.5-mile reach of the LRGFCP runs along the west and south boundaries of the City of Hidalgo, Texas. A hydraulic study of the Hidalgo Protective Levee System levee system indicated that an increase in height, ranging from 3 to 9 feet, would be required to meet design criteria for flood protection. These criteria require a levee freeboard of 3 feet above anticipated water level during the design flood event.

PROPOSED ACTION

The USIBWC is considering alternatives to raise the Hidalgo Protective Levee System. The proposed action will take place in two construction phases, each covering separate geographic reaches of the Hidalgo Protective Levee System. Phase 1 encompasses the upstream 3.3-mile reach of the levee system, from the Hidalgo Levee junction with the LRGFCP Main Floodway, to the west margin of the Hidalgo-Reynosa International Bridge. Phase 2, for subsequent implementation, covers the 1.2-mile downstream reach starting at the international bridge. The phased construction approach responds to the likely availability of early funding for Phase 1, the upstream reach of the project.

In-place increase of levee height under the *Phase 1 Footprint Expansion Alternative* is the Proposed Action for Phase 1 of the project. This alternative will increase flood containment capacity by raising the height of the existing compacted earthen levee to meet the freeboard requirement indicated by the hydraulic model. Soil borrow easements will be used to secure levee material.

Partial rerouting of the 1.2-mile downstream reach of the levee system under the *Partial Levee Rerouting Alternative* is the Phase 2 Proposed Action. Levee rerouting is proposed to eliminate the need for construction of a floodwall in front of the Hidalgo Historic Pumphouse, a resource included in the National Register of Historic Places (NRHP). A new levee segment, approximately 0.7 mile in length, will be built along the south margin of the pumphouse intake channel, and the channel will be crossed to tie the new structure to the existing levee system. Floodwall placement will be required along the Hidalgo-Reynosa International Bridge.

Alternatives under consideration to improve the Hidalgo Protective Levee System will expand the levee footprint by lateral extension of the structure. Levee footprint increases toward the riverside could potentially extend into floodplain areas designated by the U.S. Fish and Wildlife Service as part of the Lower Rio Grande Valley (LRGV) National Wildlife Refuge System. Footprint increases toward the levee landside could extend beyond the USIBWC right-of-way.

ALTERNATIVES TO THE PROPOSED ACTION

PHASE 1 ALTERNATIVE

A *Phase 1 No Action Alternative* was evaluated for the 3.3-mile upstream reach of the levee system. This alternative would retain the existing configuration of the Hidalgo Protective Levee System, as designed over 30 years ago, and the current level of protection currently associated with this system. Under severe storm events, current containment capacity will be insufficient to fully control Rio Grande flooding with risks to personal safety and property.

PHASE 2 ALTERNATIVES

A *Phase 2 No Action Alternative* and two action alternatives to the Proposed Action were evaluated for Phase 2 of the levee system improvement project: the *Footprint Expansion Alternative*, and the *No-Footprint Expansion Alternative.*

Under the *Phase 2 No Action Alternative,* the existing Hidalgo Protective Levee System would be retained in its current configuration along levee miles 3.3 to 4.5.

Under the *Phase 2 Footprint Expansion Alternative*, height of the existing levee would be increased with the associated lateral expansion of the footprint. Placement of floodwalls would be required at two segments where retaining walls are currently present: along the two spans of the Hidalgo-Reynosa International Bridge, and along the Hidalgo Historic Pumphouse.

Under the *No-Footprint Expansion Alternative*, a mechanically stabilized earth structure along the levee crown would eliminate the need for an expanded earthen levee and footprint expansion. Floodwall placement would be required both at the Hidalgo Historic Pumphouse and along the two spans of the Hidalgo-Reynosa International Bridge.

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 which included 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 raising the 4.5-mile Hidalgo Protective Levee System to meet current requirements for flood control. The EA, which supports this Finding of No Significant Impact, evaluated the Proposed Action and Alternatives.

This Finding of No Significant Impact for the proposed action and alternatives is based on adoption of mitigation measures identified during the scoping process between the lead agency, the USIBWC, and cooperating agencies. Mitigation involving the substitution of borrow sites in the LRGV National Wildlife Refuge grassland instead of USIBWC easement property containing thorn woodland will reduce potential significant adverse impact on wildlife habitat to less than significant levels.

EVALUATION OF PHASE 1 ALTERNATIVES

NO ACTION ALTERNATIVE

The Phase 1 No Action Alternative was evaluated as the single alternative action to the Proposed Action. The No Action Alternative would retain the current configuration of the Hidalgo Protective Levee System, with no impacts on biological and cultural resources, land use and soil, community resources, or environmental health issues. In terms of flood protection, however, current containment capacity under the No Action Alternative may be insufficient to fully control Rio Grande flooding under severe storm events, with associated risks to personal safety and property.

PHASE 1 PROPOSED ACTION: EXPANDED LEVEE FOOTPRINT ALTERNATIVE

Biological Resources. Up to 9.9 acres of grassland will be removed from the levee expansion corridor. Impacts to vegetation will also occur in a 37-acre excavation area within the LRGV National Wildlife Refuge where thorn woodland communities are managed to enhance habitat quality by increasing vegetation density. The potential adverse impact will be significant because the removal represents 31 percent of thorn woodland, a quality wildlife habitat, currently present in the Pate Bend Tract of the refuge. While removal of thorn woodland from borrow easements will have a potential significant adverse impact on wildlife habitat, minimum impact on threatened and endangered species is anticipated. The alternative will have no impacts to wetlands.

Cultural Resources. No historical or architectural resources are located within levee expansion areas or borrow easements under Phase 1 activities. Improvements to the levee system have a low potential to impact archaeological resources; previous investigations concluded that ground disturbance extending no more than 6 feet in depth would not likely impact significant archeological deposits. One area of high probability for historic-era archaeological sites was identified near the McAllen Pumphouse; this is also a possible location for prehistoric archaeological sites. Excavation of soil from the

designated borrow areas may involve deeper disturbance than levee construction, increasing the possibility of impacting archaeological remains.

Water Resources. Improvements to the Hidalgo Protective Levee System will increase flood containment capacity to control the design flood event with a minimum increase in resulting water elevation. Levee footprint expansion will not affect water bodies.

Land Use and Soil. Some footprint extension beyond the levee right-of-way could occur. Under the riverside offset alignment, up to 1.1 acres of agricultural lands, 0.3 acre of commercial industrial, and 0.1 acre of municipal-county land will be included within the 39.7-acre, expanded footprint. An estimated 37-acre excavation area at an average depth of 6 feet will be required. Potential use of borrow easement use is restricted by its location within the LRGV National Wildlife Refuge. Easement vegetation, primarily thorn woodland, provides a relatively high quality wildlife habitat.

Community Resources. Influx of federal funds into Hidalgo County from the levee improvement will have a positive local economic impact, but the benefit will be limited to the construction period and represent less than 0.2 percent of the annual county employment, income, and sales values. No adverse impacts to disproportionately high minority and low-income populations were identified. Minimum utilization of public roads during construction is anticipated; a temporary increase in access road use will be required for equipment mobilization to staging areas.

Environmental Health Issues. Estimated emissions for five air criteria pollutants represent less than 1 percent of the Hidalgo County annual emissions inventory. Moderate increases in ambient noise levels will result from excavation and fill activities, with no long-term and regular exposure above threshold values for adverse impacts. No waste storage or disposal sites were identified within the expanded levee footprint and its vicinity.

EVALUATION OF PHASE 2 ALTERNATIVES

NO ACTION ALTERNATIVE

The Phase 2 No Action Alternative was evaluated as one of three alternatives to the Proposed Action. The No Action Alternative would retain the current configuration of the Hidalgo Protective Levee System, with no impacts on biological and cultural resources, land use and soil, community resources, or environmental health issues. In terms of flood protection, however, current containment capacity under the No Action Alternative may be insufficient to fully control Rio Grande flooding under severe storm events, with associated risks to personal safety and property.

PHASE 2 PROPOSED ACTION: PARTIAL LEVEE REROUTING ALTERNATIVE

Biological Resources.

Grassland along the existing levee and adjacent areas will be temporarily removed for the 4.6-acre levee expansion corridor. The new levee segment, with a footprint ranging from 3.8 and 5.4 acres, will require removal of predominantly grassland vegetation. Up to 11.8 acres of thorn woodland will be removed from borrow areas, and 3.9 acres from the

new levee footprint, which will moderately reduce *wildlife* habitat. The combined impact of Phases 1 and 2 will be a potential significant adverse impact because the anticipated removal of 36 acres represents 34 percent of the thorn woodland currently present at the Pate Bend Tract of the LRGV National Wildlife Refuge. Minimum impacts to threatened and endangered species are anticipated. Less than 1 acre of *wetlands* will be removed by the intake channel crossing (from 0.5 to 0.7 acre, depending on location).

Cultural Resources. In terms of *historical resources*, levee rerouting will retain the current setting and historic landscape of a NRHP resource, the Historic Hidalgo Pumphouse, by eliminating the need for a floodwall. This alternative will also preserve the visual connection between the intake channel and the pumphouse building complex and museum. Crossing of the intake channel will be required, with a moderate visual impact. In terms of *archaeological resources*, the alternative has a low potential for impacts along the existing levee. One area of high probability for historic-era archaeological sites was identified near the Historic Hidalgo Pumphouse; this is also a possible location for prehistoric archaeological sites. Areas along the new levee path are unlikely to retain significant archaeological remains because a major flood in the 1930s shifted the river channel to near its present location and may have scoured the land between the intake channel and the current course of the river. Excavation of soil from the designated borrow areas may involve deeper disturbance than levee construction, increasing the possibility of impacting archaeological remains.

Water Resources. Improvements to the Hidalgo Protective Levee System will increase flood containment capacity to control the design flood event with a minimum increase in resulting water elevation. Water exchange between the pumphouse intake channel and the Rio Grande will be facilitated by placement of a flow control structure in the levee crossing.

Land Use and Soil. In terms of land use, the rerouted levee will require use of up to 4.6 acres of lands under City of Hidalgo jurisdiction. Footprint expansion of the existing levee could extend up to 1.1 acres into municipal-county lands. The required excavation at a soil borrow easement located within the LRGV National Wildlife Refuge will be approximately 16.7 acres.

Community Resources. A small increase in employment, income, and sales is anticipated as a result of the influx of federal funds. The increase represents less than 0.13 percent of the county's annual values. No adverse impacts to disproportionately high minority and low income populations were identified. Minimum public road utilization during construction is anticipated.

Environmental Health Issues. Air emissions for five criteria pollutants represent less than 0.24 percent of the county's annual emissions inventory. A moderate increase in noise is expected during construction, without long-term and regular exposures anticipated above adverse-impact threshold values. No waste storage or disposal sites were identified within the expanded levee footprint or levee re-routing area.

Indirect Impacts. Levee re-routing will allow direct access from the TPWD World Birding Center and Historic Pumphouse to the trail system along the intake channel. The

potential need for future modification of the Hidalgo Hike and Bike Trail system during Phase 2 construction will be reduced to a 0.4 mile levee segment.

PHASE 2 FOOTPRINT EXPANSION ALTERNATIVE

Biological Resources. *Vegetation* will be removed from up to 6 acres from a borrow easement located within the LRGV National Wildlife Refuge and composed of approximately 50 percent thorn woodland. Levee expansion corridor will temporarily remove 11.7 acres of grasslands. Floodwall construction will require minimum vegetation removal. *Wildlife habitat* will be moderately reduced by the removal of up to 3 acres of thorn woodland from borrow easements. The combined impact of Phases 1 and 2 will be a 44.8-acre removal of thorn woodland currently present at the Pate Bend Tract of the LRGV National Wildlife Refuge. The combined loss of thorn woodland will be a potential significant adverse impact, as it represents nearly 42 percent of the Pate Bend Tract occupied by that plant community. Minimum impacts to threatened and endangered species are anticipated. No *wetlands* are located within the levee footprint expansion corridor or soil borrow easements and will not be impacted.

Cultural Resources. In terms of historical resources, floodwall construction along the Hidalgo Historic Pumphouse has a potential to physically impact the NRHP resource, including obstruction of the visual connection with the intake channel. There is also a moderate potential to physically impact the pumphouse intake channel. In terms of *archaeological resources*, the alternative has a low potential for impacts along the existing levee. One area of high probability for historic-era archaeological sites was identified near the Historic Hidalgo Pumphouse; this is also a possible location for prehistoric archaeological sites. Excavation of soil from the designated borrow areas may involve deeper disturbance than levee construction, increasing the possibility of impacting archaeological remains.

Water Resources. Flood containment capacity will be increased to control the design flood event. The alternative will not affect water bodies.

Land Use and Soil. In terms of land use, the 16.5-acre expanded footprint will potentially extend 2.9 acres into municipal-county lands, and 0.2 acre into commercial land. Soil will be removed from approximately 9.2 acres from a borrow easement located within the LRGV National Wildlife Refuge.

Community Resources. A small and temporary improvement in socioeconomic conditions will result from the increase in employment, income, and sales associated with the influx of federal funds. The increase will represent less than 0.05 percent of the county's annual values. No adverse impacts to disproportionately high minority and low income populations were identified. Public road use will be minimum during construction; a temporary increase in access road use will be required for equipment mobilization.

Environmental Health Issues. Air emissions for five criteria pollutants represent less than 0.12 percent of the county's annual emissions inventory. A moderate increase in noise is expected during construction, without long-term and regular exposures anticipated above adverse effect threshold values. No waste storage or disposal sites were identified within the expanded levee footprint and its vicinity.

Indirect Impacts. Floodwall construction will obstruct direct access from the TPWD World Birding Center and Historic Pumphouse to the trail system along the pumphouse intake channel. The potential need for future modification of the Hidalgo Hike and Bike Trail system during Phase 2 construction could affect a 1-mile levee segment. The floodwall would also obstruct access to the Hidalgo Bend Tract of the LRGV National Wildlife Refuge in the area immediately adjacent to the pumphouse site.

PHASE 2 NO-FOOTPRINT EXPANSION ALTERNATIVE

Biological Resources. The alternative will have no impacts to *vegetation* as levee height increase will take place along the existing levee crown. Floodwall construction will require minimum vegetation removal. Minimum impacts to *wildlife habitat* and threatened and endangered species are anticipated because the current levee footprint will not be expanded, and only 3 acres of grassland will be removed from borrow easements. No *wetlands* will be impacted by the alternative.

Cultural Resources. A minimum potential to impact archaeological resources was identified because levee footprint expansion is not required. In terms of historical resources, however, floodwall construction along the Hidalgo Historic Pumphouse will physically impact the NRHP resource, including obstruction of the visual connection with the intake channel. There is also a moderate potential to physically affect the pumphouse intake channel.

Water Resources. Flood containment capacity will be increased to control the design flood event. The alternative will not affect water bodies.

Land Use and Soil. The alternative will have no impacts on land use because levee footprint expansion is not required. Excavation at a soil borrow site will be limited to 3.0 acres of grassland areas.

Community Resources. A small and temporary improvement in socioeconomic conditions will result from the increase in employment, income, and sales associated with the influx of federal funds. The increase represents less than 0.1 percent of the county's annual values. No adverse impacts to disproportionately high minority and low income populations were identified. Public road use will be minimum during construction; a temporary increase in access road use will be required for equipment mobilization. The raised concrete structure will limit potential use of the levee crown as a service road for USIBWC maintenance activities.

Environmental Health Issues. Air emissions for five criteria pollutants will be low, less than 0.1 percent of the county's annual emissions inventory. A moderate increase in noise is expected during construction, without long-term and regular exposures anticipated above adverse effect threshold values. No waste storage or disposal sites were identified within the expanded levee footprint and its vicinity.

Indirect Impacts. Floodwall construction will obstruct direct access from the TPWD World Birding Center and Historic Pumphouse to the trail system along the pumphouse intake channel. The floodwall would also obstruct access to the Hidalgo Bend Tract of the LRGV National Wildlife Refuge in the area immediately adjacent to the pumphouse site.

MITIGATION

Use of two USIBWC soil borrow easements located within the LRGV National Wildlife Refuge was recognized early in the scoping process as a potential significant adverse impact due to the required removal of thorn woodland, a valuable wildlife habitat. Consequently, potential mitigation measures were identified between the USIBWC and the USFWS, a cooperating agency in preparation of the EA. The proposed mitigation action will relocate borrow sites within the Pate Bend Tract of the LRGV National Wildlife Refuge from their current location in thorn woodland-dominated areas to grasslands of low habitat quality. Grasslands within the refuge are dominated by bufflegrass, an invasive species. Borrow site relocation will reduce potential significant adverse impacts to wildlife habitat to less than significant levels, and provide opportunities for habitat enhancement by planned modification of site topography and vegetation cover.

Based on project review under Section 106 of the National Historic Preservation Act of 1966, the USIBWC and the THC will enter into a Memorandum of Agreement to define the terms under which the adverse effect on the Hidalgo Historic pump house could be mitigated. The selection of the Partial Levee Rerouting Alternative by the USIBWC would reduce the potential adverse effect of obscuring the south elevation of the building and view from the property. In addition the Memorandum of Agreement would address the mitigation for the impact on potential archaeological resources. An archaeological survey would be conducted for new construction areas and borrow locations, and detailed procedures specified for avoidance or mitigation of any significant archaeological deposits discovered during surveys or testing.

DECISION

Based on my review of the facts and analyses contained in the Environmental Assessment, I conclude that implementation of the Proposed Action with mitigation by borrow site relocation will not have a significant impact, either by itself or when considering cumulative impacts. The enforcement of this mitigation is within the authority of the lead agency, the USIBWC, and the cooperating agency, the U.S. Fish and Wildlife Service. Accordingly, requirements of the NEPA and regulations promulgated by the Council on Environmental Quality are fulfilled and an environmental impact statement is not required.

Carlos Marin, Acting Commissioner
International Boundary and Water Commission,
United States Section

9/9/05
Date

Final Environmental Assessment

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FINAL ENVIRONMENTAL ASSESSMENT

ALTERNATIVES FOR IMPROVED FLOOD CONTROL OF THE HIDALGO PROTECTIVE LEVEE SYSTEM

Lead Agency:

UNITED STATES SECTION,
INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

Cooperating Agencies:

UNITED STATES
FISH AND WILDLIFE SERVICE

TEXAS PARKS AND
WILDLIFE DEPARTMENT

Technical Support:

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USIBWC Contract IBM04D0002, Task Order IBM05T0009

SEPTEMBER 2005

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ACRONYMS AND ABBREVIATIONS

amsl	Above mean sea level
AQCR	Air Quality Control Region
BMP	Best management practice
CFR	Code of Federal Regulations
cfs	Cubic feet per second
dB	Decibel
dbA	A-weighted sound level in dBs
DNL	Day-night average sound level
EIS	Environmental impact statement
FONSI	Finding of no significant impact
HPA	High probability area
IBWC	International Boundary and Water Commission
LRGFCP	Lower Rio Grande Flood Control Project
NAAQS	National Ambient Air Quality Standards
MxIBWC	Mexican Section, International Boundary and Water Commission
NEPA	National Environmental Policy Act
NRCS	National Resources Conservation Service
NRHP	National Register of Historic Places
RCRA	Resource Conservation and Recovery Act
ROW	Right of way
RTHL	Recorded Texas Historic Landmark
SAL	State Archeological Landmark
T&E	Threatened and Endangered
TCEQ	Texas Commission on Environmental Quality
THC	Texas Historic Commission
TPWD	Texas Parks and Wildlife Department
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USIBWC	United States Section, International Boundary and Water Commission

SECTION 1
PURPOSE OF AND NEED FOR THE PROPOSED ACTION

This section discusses the purpose of and need for the proposed action; the authority of the United States Section, International Boundary and Water Commission (USIBWC) to conduct the project as part of its mission; the scope of the environmental review; a summary of environmental compliance requirements; and the organization of this document.

1.1 PURPOSE OF AND NEED FOR ACTION

This Environmental Assessment was prepared by the USIBWC to propose raising the Hidalgo Protective Levee System located in south Texas. Figure 1.1 presents a project location map with an overview of the levee system. The 4.5-mile flood control system runs along the west and south boundaries of the City of Hidalgo, and is part of the Lower Rio Grande Flood Control Project (LRGFCP). The upstream end of the levee system begins at its junction with the LRGFCP Main Floodway levee located just south of the City of McAllen.

The LRGFCP was designed to protect urban, suburban, and highly developed irrigated farm lands in the Rio Grande delta from floods, in both the United States and Mexico. The LRGFCP facilities on the United States side are located in Hidalgo, Cameron, and Willacy Counties, Texas, with 102 miles of river levees beginning near the Town of Peñitas, about 180 river miles from the Gulf of Mexico. The LRGFCP flood levees are grass-covered earthen structures, with a distance between the United States and Mexican levees ranging from approximately 400 feet to 3 miles (USIBWC, 1992). Two diversion dams are also key components of the LRGFCP: the Anzalduas Diversion Dam, completed in 1960, that diverts flood water into the United States interior floodway (an interior floodway system flanked by 168 miles of levees), and Retamal Diversion Dam, completed in 1973 for flood water diversion into Mexico's interior floodway (USIBWC, 1980).

The Hidalgo Protective Levee System was recently identified as one of the LRGFCP priority areas to improve flood containment as it does not meet design criteria for the design flood event. The need for improvements to the 4.5-mile levee system was determined by hydraulic modeling conducted by the USIBWC, as reported in the June 2003 document entitled *Hydraulic Model of the Rio Grande and Floodways Within the Lower Rio Grande Flood Control Project* (USIBWC, 2003a). The study updated findings of a prior 1992 study by incorporating new structures and geometrical data, as well as changes associated with land use and agricultural practices and increased reliability of the hydraulic model with enhanced software capabilities. The USIBWC hydraulic study for the Hidalgo Protective Levee System indicated that an increase in levee height, ranging from 3 to 9 feet, would be required to meet design criteria for flood protection. These criteria require a levee freeboard of 3 feet above anticipated water level during the design flood event.

In addition to the flood containment evaluation, an assessment of the levee system structural integrity was conducted for the USIBWC in 2003 by the Engineer Research and Development Center of the U.S. Army Corps of Engineers (USACE). No structural deficiencies were reported for the Hidalgo Protective Levee System (USACE 2003).

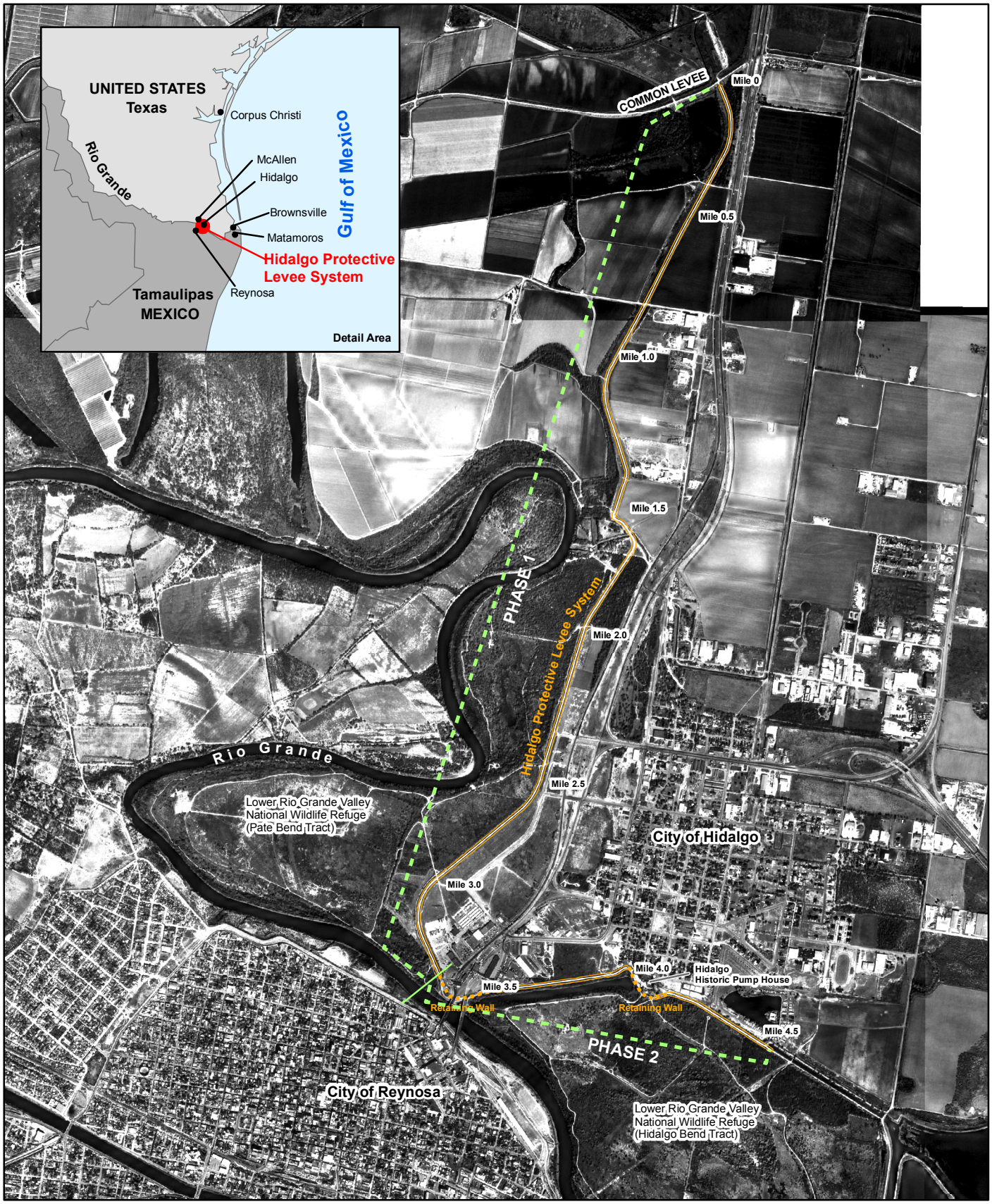
Alternatives under consideration to improve the Hidalgo Protective Levee System would increase current levee height, expanding the levee footprint by lateral extension of the structure. Levee footprint increases toward the riverside could potentially extend into floodplain areas designated by the United States Fish and Wildlife Service (USFWS) as part of the Lower Rio Grande Valley (LRGV) National Wildlife Refuge system. Footprint increases toward the levee landside could extend beyond the USIBWC right-of-way.

The proposed action would take place in two construction phases, each covering separate geographic reaches of the Hidalgo Protective Levee System. Phase 1 encompasses the upstream 3.3-mile reach of the levee system, from the Hidalgo Levee junction with the LRGFCP Main Floodway, to the west margin of the Hidalgo-Reynosa International Bridge. Phase 2, for subsequent implementation, covers the 1.2-mile downstream reach starting at the international bridge. The phased construction approach responds to the likely availability of early funding for Phase 1, the upstream reach of the project.

1.2 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 (the USIBWC) and a Mexican Section (MxIBWC). 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, the third of which covers the proposed raising of the Hidalgo Protective Levee System:

- 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 solution of border sanitation and other border water quality problems;



Scale = 1 : 30,000

0 1,000 2,000 4,000 6,000 8,000 Feet

0 250 500 1,000 1,500 2,000 Meters

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Figure 1.1
Project Location Map

Hidalgo Protective Levee System
International Boundary and Water Commission,
United States Section
September 2005

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- Preservation of the Rio Grande and Colorado River as the international boundary; and
- Demarcation of the land boundary.

1.3 SCOPE OF THE ENVIRONMENTAL REVIEW

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 issued regulations to implement NEPA that include provisions for both the content and procedural aspects of the required environmental analysis. In 1978, the Council on Environmental Quality 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; Appendix 501-A). These federal regulations establish both the administrative process and substantive scope of the environmental impact evaluation designed to ensure that deciding authorities have a proper understanding of the potential environmental consequences of a contemplated course of action. The Council on Environmental Quality regulations require that an environmental assessment:

- Briefly provide evidence and analysis to determine whether the proposed action might have significant effects that would require preparation of an environmental impact statement (EIS). If analysis determines that the environmental effects would not be significant, a finding of no significant impact (FONSI) is prepared;
- Facilitate the preparation of an EIS, when required; or
- Aid an agency's compliance with NEPA when no EIS is necessary.

This Environmental Assessment identifies and evaluates the potential environmental consequences that may result from implementation of the proposed action and alternatives. It also characterizes the affected environment and describes, when required, mitigation measures to prevent or minimize impacts to environmental resources. The following resource areas are analyzed for potential environmental consequences: biological resources; cultural resources; water resources; land use and soil; and community resources (socioeconomics, environmental justice, and transportation). Environmental health issues are also evaluated (air quality, noise, and hazardous and toxic waste).

Analyses of the environmental resources for the affected environment and environmental consequences are based on a potential impact corridor around the existing 4.5-mile Hidalgo Protective Levee System; two USIBWC soil borrow easements located

within the LRGV National Wildlife Refuge; and the proposed area for partial rerouting of the levee system (south margin of the Hidalgo Historic Pumphouse intake channel). The levee corridor used in the evaluation varies from 200 feet for plant communities (100 feet lateral distance from the levee centerline) to 1,000 feet for the land use evaluation, and up to 1 mile for identification of recorded waste activities and disposal.

Analyses of environmental consequences also include potential indirect impacts adjacent to the levee corridor, borrow sites, and the region depending on the resource and its relationship to the proposed action and alternatives. Reference values for air quality, cultural resources, socioeconomics, and environmental justice are evaluated on a regional basis (county level).

Studies conducted in support of the Environmental Assessment preparation, provided in the document *Technical Support Studies for the Environmental Assessment of Alternatives for Improved Flood Control of the Hidalgo Protective Levee System* (Parsons, 2005), were used to document baseline conditions for biological resources, cultural resources, wetlands and waste storage and disposal. The report also documents potential performance of the levee system, based on hydraulic model simulations. A copy of the Technical Support Studies report is provided in electronic form along with the Draft Environmental Assessment (CD attached inside the front cover of this document).

The most recent information is used for the impact analyses. Impacts are considered for the time period covered under the Phase 1 and Phase 2 construction periods, and subsequent flood control improvement conditions. Potential environmental consequences of each phase are discussed separately in this Environmental Assessment.

1.4 ENVIRONMENTAL COORDINATION AND COMPLIANCE ANALYSIS

Table 1.1 is a summary of regulatory and/or permitting requirements potentially applicable to improvements under consideration for the Hidalgo Protective Levee System. Environmental coordination and compliance issues indicating the anticipated level of interagency coordination are listed. Key issues identified are:

- Use of soil borrow easements located within the LRGV National Wildlife Refuge;
- Potential impacts to TPWD Old Hidalgo Pumphouse site of the World Birding Center project;
- Potential impacts to the City of Hidalgo Historic Pumphouse;
- Mitigation for impacts to wetlands along the Historic Pumphouse intake channel.; and
- Coordination for completion of Hidalgo Hike and Bike Trail.

Table 1.1 Summary of Environmental Coordination and Compliance

Agency	Regulation / Issue	Level of USIBWC Coordination with Agency
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) FWS Coordination Act (916 U.S.C. 661 *et seq*.)	Section 7 of the Act requires formal consultation when significant adverse impacts to federally-listed threatened and endangered species, and migratory birds, could occur. Consultation with USFWS regarding impacts of the proposed action, including use of soil borrow easements within the LRGV National Wildlife Refuge.
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 Parks Grant Programs	Coordination concerning potential impacts of the levee raising project to wildlife. Hidalgo Unit of the World Birding Center
Cultural Resources		
Texas Historic Commission (THC)	National Historic Preservation Act of 1966, as amended (16 U.S.C. 470 *et seq*.)	Compliance with Section 106 requirements for potential impacts to archaeological and historic resources (Hidalgo Historic Pumphouse). A Memorandum for Agreement may be required.
Water Resources		
U.S. Army Corps of Engineers (USACE)	Section 10 of the Rivers and Harbors Act of 1899 Section 404 of the Clean Water Act (33 U.S.C 1344)	Pre-permit consultation, and permit application for crossing the intake channel. Mitigation plan and permit application for impacts to wetlands.
Texas Commission on Environmental Quality (TCEQ)	Section 401 of the Clean Water Act (33 U.S.C. 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 Section 404 of the Clean Water Act	Requirements for National Pollution Discharge Elimination System- construction permit and Storm Water Pollution Prevention Plan preparation. Section 404 Certification; coordination is typically a function of the USACE permitting process.
Land Use		
City of McAllen	Hidalgo-Reynosa International Bridge	Floodwall placement along the two bridge spans.
Texas Department of Transportation	Grants programs	Coordination for completion of Hidalgo Hike and Bike Trail.
Natural Resources Conservation Service (NRCS)	Farmland Protection Policy Act	Determination that no unique or prime farmland would be affected by the project.

1.5 ORGANIZATION OF THE ENVIRONMENTAL ASSESSMENT

This Environmental Assessment comprises eight major sections, as follows:

Section 1 identifies the purpose of and need for the proposed action, defines the scope of the environmental review, and provides an environmental coordination and compliance analysis.

Section 2 describes the proposed action, alternatives to the proposed action, and summarizes environmental impacts of the alternatives.

Section 3 presents information on the affected environment, providing a basis for analyzing the impacts of the alternatives.

Section 4 analyzes the environmental consequences of the levee improvement alternatives during implementation of Phase 1.

Section 5 analyzes the environmental consequences of the levee improvement alternatives during implementation of Phase 2.

Section 6 discusses proposed mitigation actions.

Section 7 describes the consultation process and lists persons and agencies consulted, and contributors to the Environmental Assessment preparation.

Section 8 is a list of cited references and source documents relevant to preparation of the Environmental Assessment.

SECTION 2
DESCRIPTION OF ALTERNATIVES

This section presents a description of the Proposed Action and alternatives. Actions to be implemented under Phases 1 and 2 of the project are discussed separately. Phase 1 encompasses the upstream 3.3-mile reach of the Hidalgo Protective Levee System, from the LRGFCP Main Floodway to the Hidalgo-Reynosa International Bridge. Phase 2, for subsequent implementation, covers the 1.2-mile downstream reach extending from the international bridge. A summary of potential environmental impacts are given at the end of Section 2.

2.1 PHASE 1 ALTERNATIVES

Two alternatives were considered for Phase 1 improvements to the upstream reach of the Hidalgo Protective Levee System:

1. *No Action Alternative*: the existing levee system would be retained in its current configuration.
2. *Footprint Expansion Alternative (Proposed Phase 1 Action):* In-place height increase of existing levee with associated lateral expansion of the footprint.

2.1.1 Phase 1 No Action Alternative

Under the Phase 1 No Action Alternative the existing upstream reach of the Hidalgo Protective Levee System would be retained in its current configuration (Figure 2.1). The system starts at the north junction of the Hidalgo levee with the Main Floodway levee of the LRGFCP (levee mile 0.0), and extends south to join the Hidalgo-Reynosa International Bridge (levee mile 3.3). The existing levee is a raised trapezoidal structure with a typical height from 8 to 10 feet, and a 3:1 side slope ratio (units of horizontal run in feet per foot of vertical rise). The 16-foot wide levee crown is used as a service road. The existing levee footprint ranges from 64 to 90 feet, depending on location.

The 1.5-mile upstream reach of the levee is located in an agricultural area with minimum residential development (Figure 2.1). This segment of the Hidalgo Protective Levee System extends from its junction with the Main Floodway levee to the intake channel of the McAllen Pumphouse. The pumphouse and intake channel are owned and operated by the Hidalgo County Irrigation District No. 3.

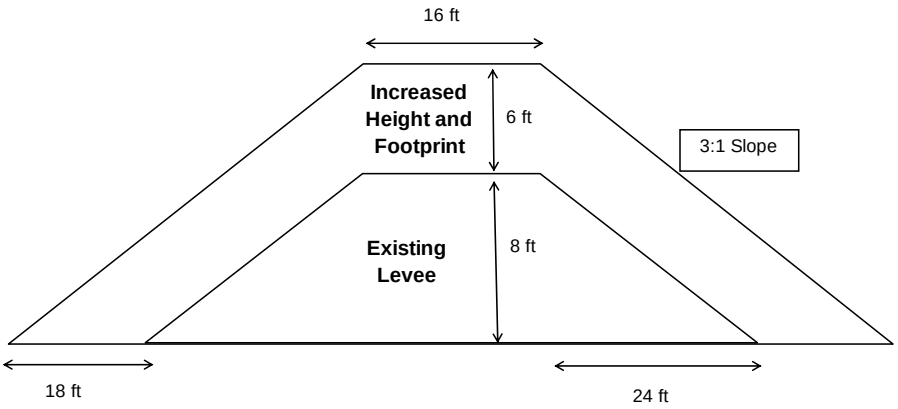
South of the McAllen Pumphouse and extending to the west span of the international bridge at levee mile 3.3, the levee riverside margin borders the LRGV National Wildlife Refuge. On the landside, the levee system is adjacent to private land west of the City of Hidalgo. Initially agricultural, in recent years the land has been extensively transformed into commercial and residential property. Along the international bridge, the compacted earthen levee system is replaced by a sloped concrete retaining wall.

2.1.2 Footprint Expansion Alternative (Proposed Phase 1 Action)

This alternative would increase flood containment capacity by raising the height of the existing compacted earthen levee to meet the freeboard requirement indicated by the hydraulic model. Soil borrow easements would be used to secure levee material.

Levee Height Increase

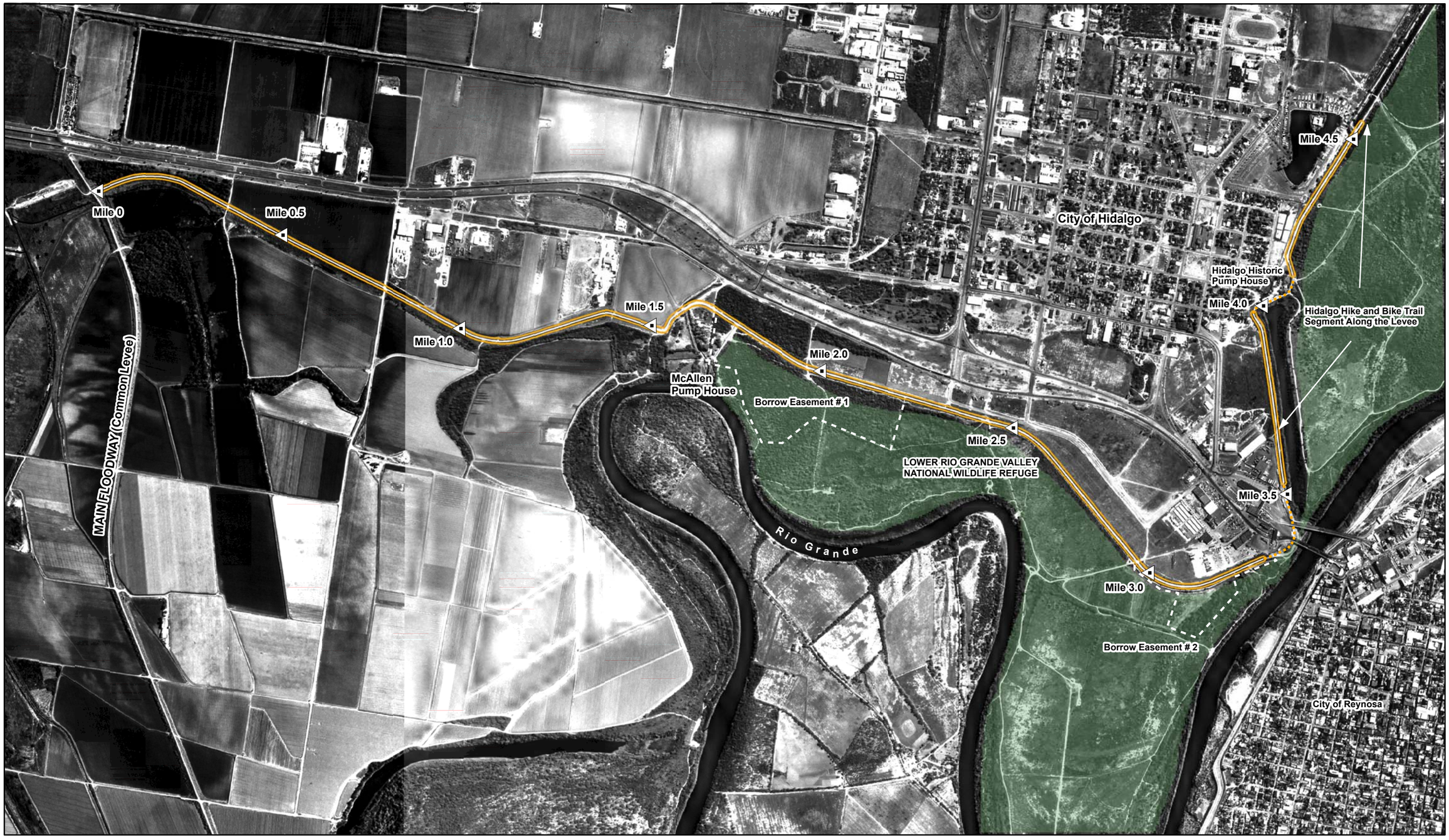
For a typical levee cross-section, shown in the diagram below (8 feet elevation, 3:1 slope and 16-foot wide crown), a 6-foot increase in levee height would result in an 18-foot increase of the footprint on each side of the levee. A current footprint width value of 64 feet would expand to 100 feet as a result of the increased levee height.



The levee system is located within a narrow right-of-way (ROW) corridor under USIBWC jurisdiction. In some locations, potential footprint expansion could extend past ROW boundaries. Typically, levee expansion would take place over the existing levee, retaining its overall alignment by centered extension of the footprint. Because of the limited ROW availability, however, the expansion could be made with an offset centerline that places the additional footprint on only one side of the existing levee. Three alignment options analyzed in this Environmental Assessment are as follows:

- Alignment A: centered expansion, with equal footprint increases along the current levee centerline;
- Alignment B: riverside offset expansion, with additional footprint extending entirely from the current riverside margin of the levee; and
- Alignment C: landside offset expansion, with additional footprint extending entirely from the current landside margin of the levee.

Figures 2.2, 2.3 and 2.4 present the current levee crown alignment, as well as the potential footprint expansion for the levee segments between levee miles 0.0 to 1.0, 1.0 to 2.0, and 2.0 to 3.3, respectively. The centered expansion alignment is indicated by continuous, green lines placed symmetrically on each side of the existing levee. Offset alignments are delineated by dotted red lines surrounding the centered expansion.



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0 1,250 2,500 5,000 Feet

0 0.125 0.25 0.5 0.75 1 Miles

Legend

- Levee Crown
- Levee Footprint
- Retaining Wall
- Levee Mile Marker
- National Wildlife Refuge

Figure 2.1
Hidalgo Protective Levee System Overview

Hidalgo Levee Environmental Assessment
International Boundary and Water Commission,
United States Section
September 2005

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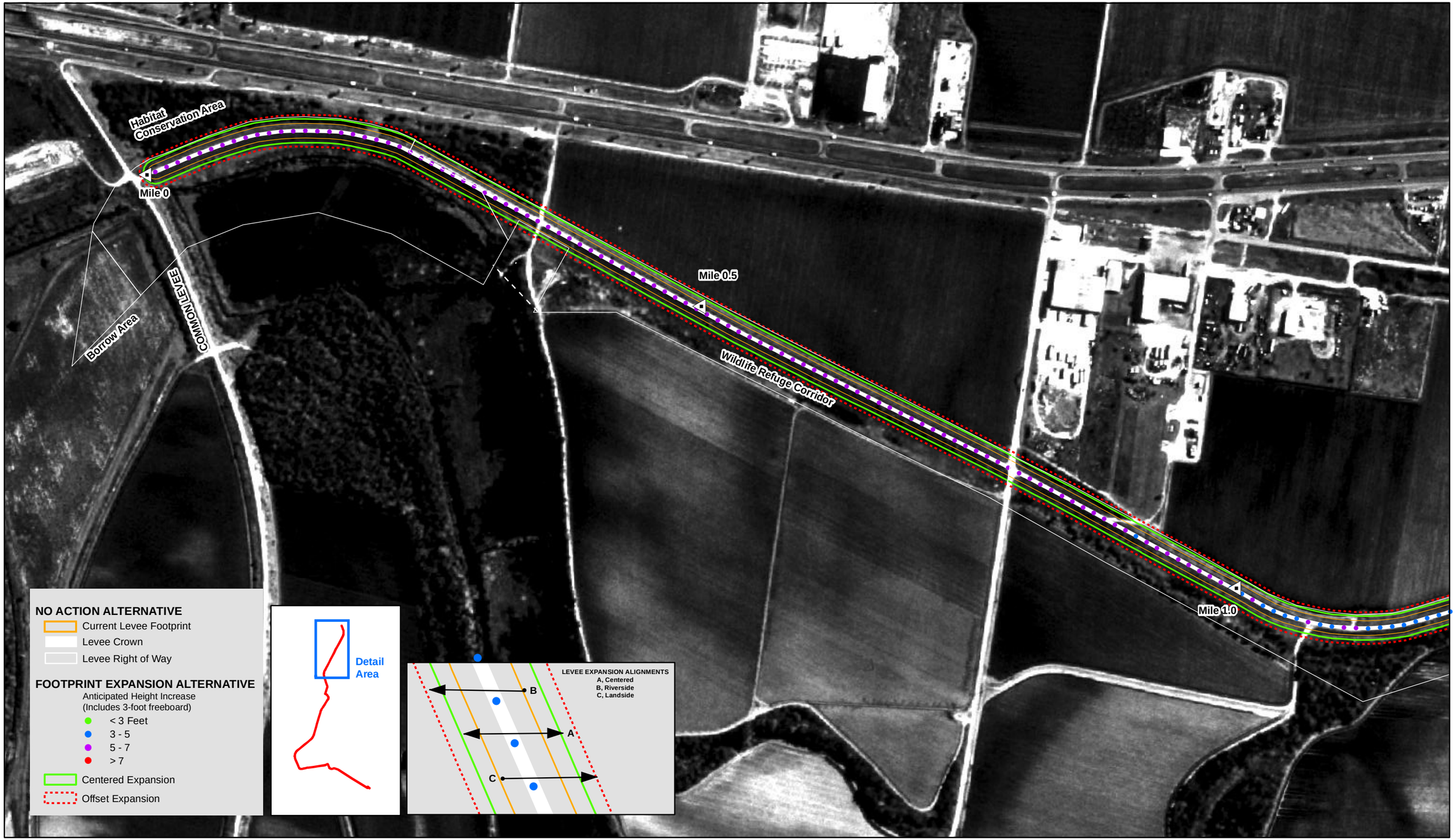

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Figure 2.2
Miles 0 to 1 Improvements
Phase 1 Alternatives

Hidalgo Protective Levee System
International Boundary and Water Commission,
United States Section
September 2005

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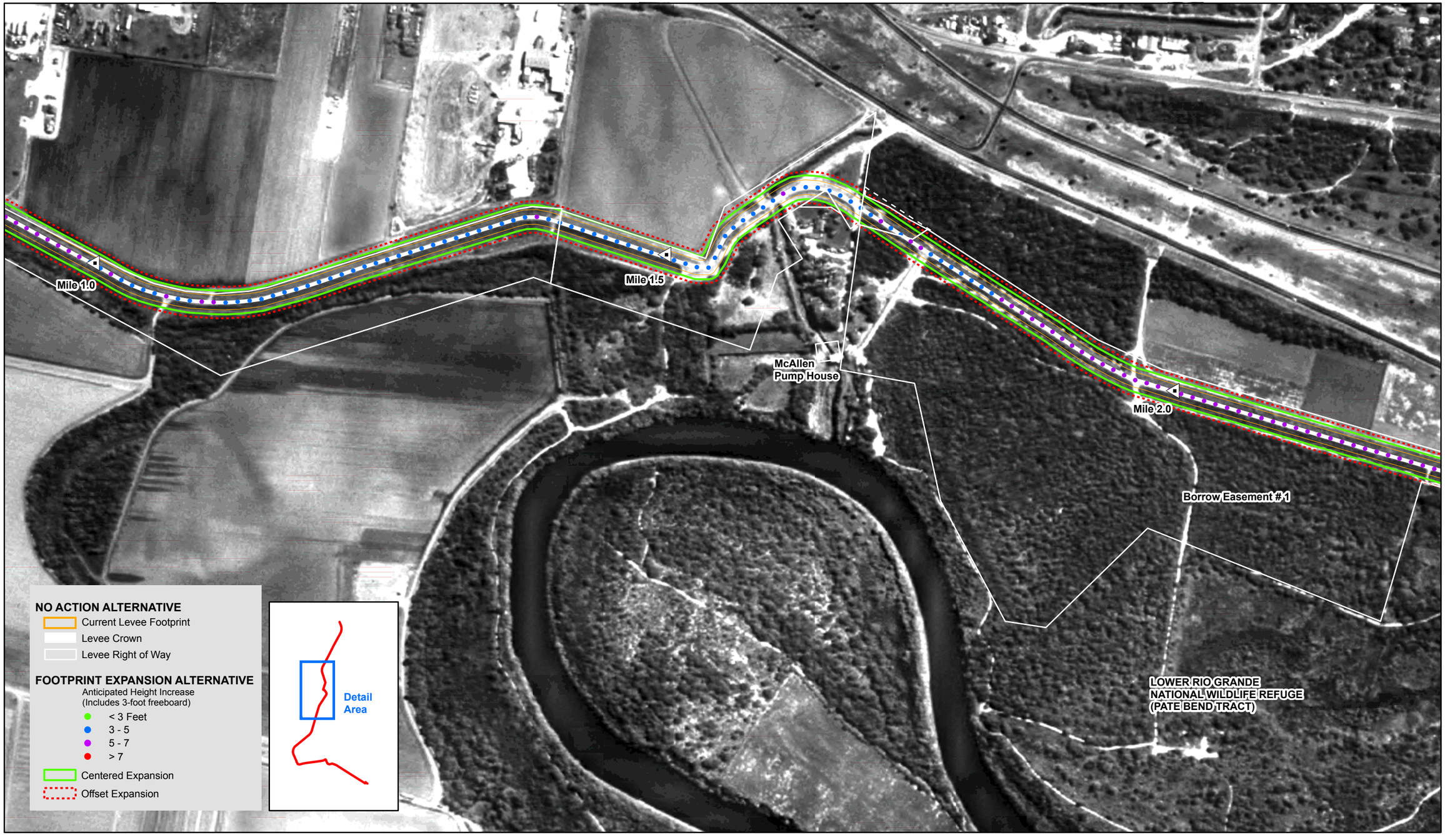

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Figure 2.3
Miles 1 to 2 Improvements
Phase 1 Alternatives

Hidalgo Protective Levee System
International Boundary and Water Commission,
United States Section
September 2005

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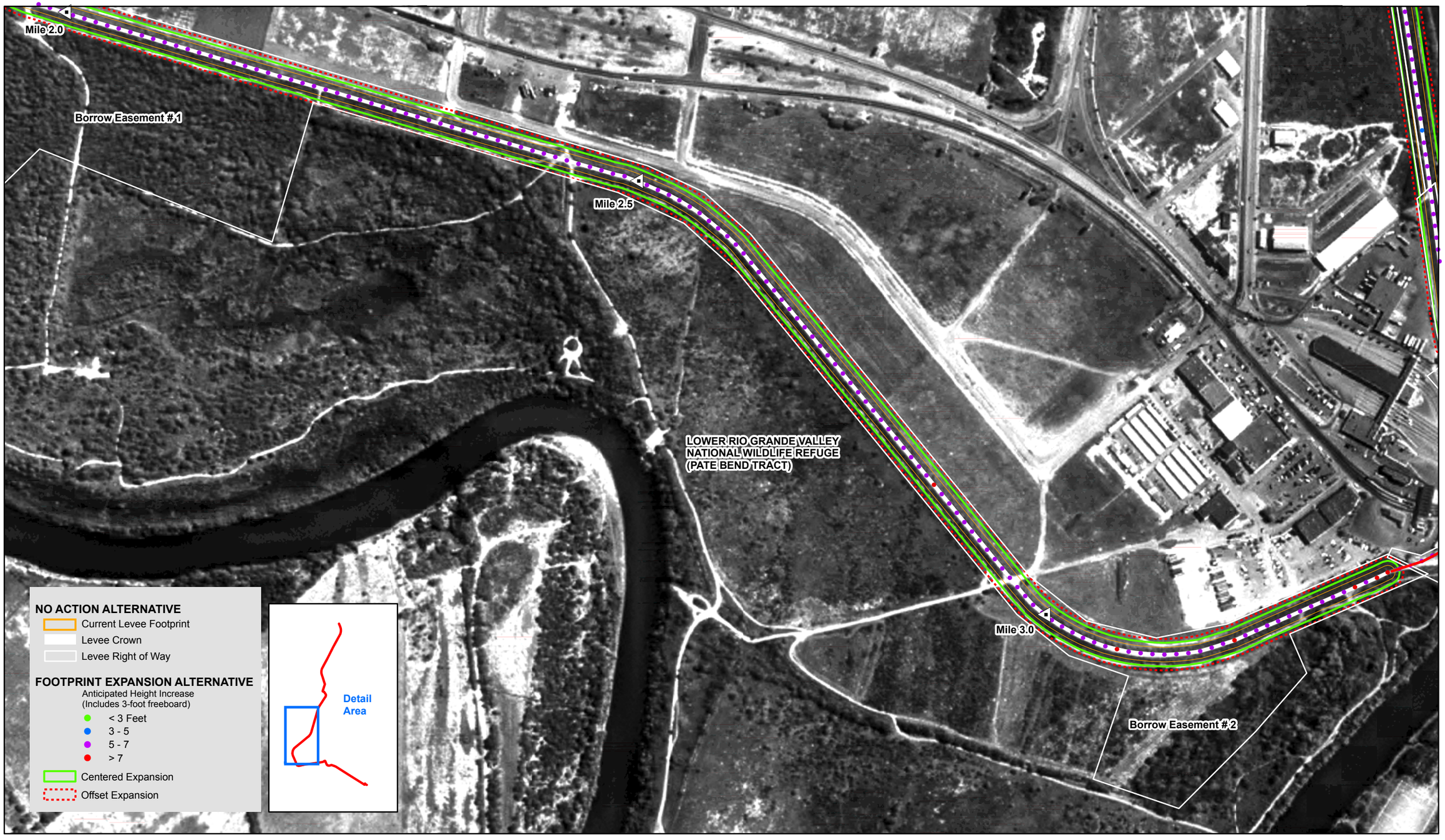

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Figure 2.4
Miles 2 to 3.3 Improvements
Phase 1 Alternatives

Hidalgo Protective Levee System
International Boundary and Water Commission,
United States Section
September 2005

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Figures 2.2, 2.3 and 2.4 also identify ROW boundaries and potential height deficiencies in the Hidalgo Protective Levee System calculated at 1/100th mile intervals. Deficiency values represent the difference in elevation between the top of the levee and anticipated water level under design flood conditions, plus an additional 3-foot freeboard added as a design criterion.

For the current Environmental Assessment, potential land use impacts of the three alignment options were evaluated separately. In practice, the selected option for construction is likely to be an optimized alignment that changes along the levee system to accommodate ROW availability, as well as engineering considerations such as the need to maximize flood containment (preferential use of landside expansion where feasible), and to minimize changes to existing irrigation structures and other infrastructure along the levee path.

Soil Borrow Easements

Soil requirements to increase levee height are estimated at 356,000 cubic yards for the Phase 1 Footprint Expansion Alternative. At an average excavation depth of 6 feet, the required borrow site would be 37 acres. The USIBWC has two soil borrow easements in agricultural land that were set aside in the early 1970s for future levee construction. Those two easements are now part of the Pate Bend Tract of the LRGV National Wildlife Refuge:

- Borrow Easement #1, with a surface area of 44.3 acres, is located just south of the McAllen Pump Station, between levee miles 1.7 to 2.3 (Figure 2.3).

- Borrow Easement #2 is located west of the international border station, between levee miles 3.0 to 3.2; this easement is 9.7 acres in size (Figure 2.4).

Use of these two borrow easements within the wildlife refuge was included in the evaluation of environmental consequences associated with levee construction. Utilization of alternate locations within the Pate Bend Tract of the LRGV National Wildlife Refuge, discussed in Subsection 6.1, is under joint evaluation by the USFWS and USIBWC to mitigate potential impacts.

2.2 PHASE 2 ALTERNATIVES

Four Phase 2 alternatives were evaluated to increase flood containment in the downstream reach of the Hidalgo Protective Levee System:

1. *No Action Alternative*: the existing Hidalgo Protective Levee System would be retained in its current configuration along levee miles 3.3 to 4.5.
2. *Footprint Expansion Alternative*: height of the existing levee would be increased, with the associated lateral expansion of the footprint previously described under Phase 1 Footprint Expansion Alternative (Subsection 2.1.2). Placement of floodwalls would be required at two

segments where retaining walls are currently present: along the two spans of the international bridge, and along the Hidalgo Historic Pumphouse.

3. *No-Footprint Expansion Alternative*: under this alternative, placement of an expanded earthen levee would be replaced by a mechanically stabilized earth structure along the levee crown; construction would be limited to the existing levee boundaries, thus eliminating the need for footprint expansion.
4. *Partial Levee Rerouting (Proposed Phase 2 Action):* partial levee rerouting to eliminate the need for construction of a floodwall in front of the Hidalgo Historic Pumphouse. A new levee segment, approximately 0.7 mile in length, would be built along the south margin of the pumphouse intake channel, and the channel would be crossed to tie the new structure to the existing levee system.

2.2.1 Phase 2 No Action Alternative

Under Phase 2 No Action Alternative, the downstream reach of the Hidalgo Protective Levee System would be retained in its current configuration (Figure 2.1). The existing levee is a compacted-earth, trapezoidal structure with a typical height from 4 to 6 feet, and a typical 3:1 side slope ratio. The 16-foot wide levee crown is used as a service road. The levee structure is replaced by concrete retaining walls at two locations:

- Along the two spans of the Hidalgo-Reynosa International Bridge, where a sloping concrete retaining wall extends along the south margin of the international border station, and joins the levee system (levee miles 3.3 to 3.5).
- In front of the Hidalgo Historic Pumphouse, at levee mile 4.0, where a concrete wall surrounds the pumphouse along the intake channel access road. The wall height ranges from 1 to 2 feet in front of the pumphouse building complex, and increases up to 5 feet as it extends approximately 500 feet east of the structure.

Starting at the retaining wall around the international bridge, the levee structure extends for approximately one-half mile along the north margin of the Old Hidalgo Pumphouse intake channel (levee miles 3.5 to 4.0), and continues as a retaining wall in front of the pumphouse. Properties north of the levee are mostly commercial, industrial, and residential, while the south margin along the intake channel is undeveloped. Land surrounding the south margin of the intake channel, under City of Hidalgo jurisdiction, is the site of a future project by the city and the TPWD that includes nature observation trails and a unit of the World Birding Center.

Most of the Phase 2 reach of the Hidalgo Protective Levee System overlaps with a segment of the Hidalgo Hike and Bike Trail, a project under development by the City of Hidalgo with funding by the Texas Department of Transportation (levee miles 3.7 to 4.5). East of the Hidalgo Historic Pumphouse, the levee system runs along the Hidalgo Bend Tract of the LRGV National Wildlife Refuge (levee miles 4.1 to 4.5).

2.2.2 Phase 2 Footprint Expansion Alternative

This alternative would increase flood containment capacity by raising the height of the existing compacted-earth levee and the two retaining wall segments to meet the freeboard requirement indicated by the hydraulic model results.

Levee Height Increase

As previously described in Subsection 2.1.2 for Phase 1, a typical 6-foot increase in levee height would result in a 36-foot increase in the footprint. The current footprint width would expand up to 80 feet as a result of the increased levee height. Figure 2.5 shows the current levee footprint and potential expansion associated with the levee height increase.

Floodwall Placement

The placement of floodwalls for two levee segments that currently have retaining walls is currently under consideration. Those segments are the two spans of the Hidalgo-Reynosa International Bridge (levee miles 3.3 to 3.5) and in front of the Old Hidalgo Historic Pumphouse (levee miles 3.9 to 4.1, approximately).

The floodwall at the Hidalgo-Reynosa International Bridge would be built along the concrete retaining wall that extends along the south margin of the international border station. The floodwall elevation would tie to the base of two bridge spans. Use of an earthen levee at this location is impractical given the limited land availability, and unwarranted from the point of view of flood control as it would further restrict the limited water path under the international bridge. Restriction of the path under the bridge would also be in conflict with its current use as the single, narrow wildlife corridor connecting the Pate Bend and Hidalgo Bend Tracts of the LRGV National Wildlife Refuge.

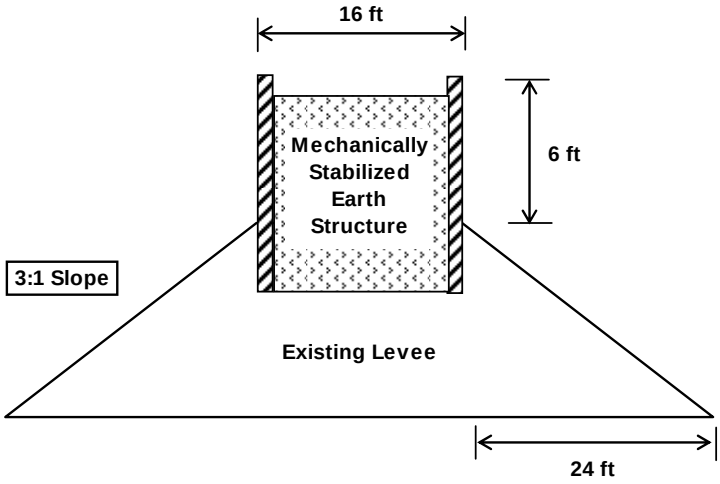
In front of the Old Hidalgo Historic Pumphouse, at levee mile 4.0, there is currently no levee, and placement of an earthen levee would not be feasible along the access road facing the intake channel. A floodwall, approximately 5 to 7 feet tall, would be constructed along the access road surrounding the pumphouse complex. Unlike current placement of the retaining wall, adjacent to the pumphouse complex, the floodwall would be built on the road's riverside margin. East of the pumphouse, the floodwall would extend for about 500 feet to connect with the expanded levee segment. Floodwall height along this segment would range from 6 to 9 feet, depending on location.

Soil Borrow Easements

An estimated 88,000 cubic yards of soil would be required to increase levee height during construction of the Phase 2 Footprint Expansion Alternative. The USIBWC does not have borrow easements adjacent to this reach of the project, so soil would be obtained from the two easements previously described in Phase 1 (Subsection 2.1.2). Identification of alternate sites within the LRGV National Wildlife Refuge, in coordination with the USFWS, is under consideration as a mitigation measure subsequently discussed in Subsection 6.1.

2.2.3 No-Footprint Expansion Alternative

The Phase 2 No-Footprint Expansion Alternative would modify the levee segments downstream (east) of the International Bridge. In this levee segment, the levee footprint would be retained at its current size and alignment by constructing a mechanically stabilized earth structure along the existing levee crown to obtain the required flood containment capability. The extent of the partial crown height increase is shown in Figure 2.6. The diagram below shows a conceptual cross-section of a mechanically stabilized earth structure for a 6-foot height increase.

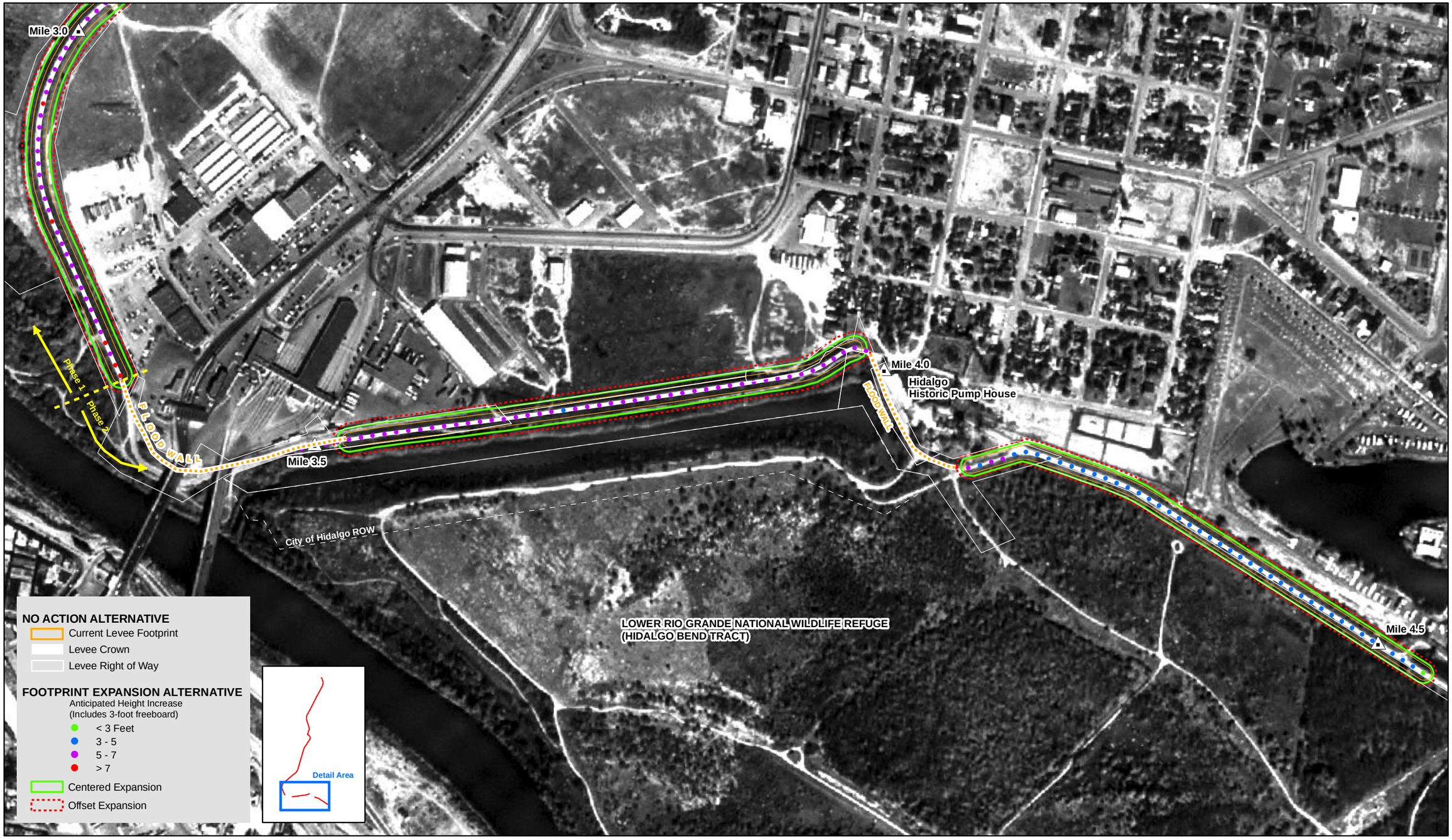


The raised structure would be made of compacted-earth reinforced with concrete face panels. The top of the existing levee would be excavated to a maximum depth of 4 feet to accommodate the structure base. The excavation depth would decrease as the structure height decreases, but a minimum of 1 foot of excavation is required to tie the new construction to the impervious core of the existing levee. The final raise would have a 14-foot top with guardrails. The modified crown width would be compatible with the 10-foot width specified for the Hidalgo Hike and Bike Trail, but would limit use of the raised structure as a service road for mobilization of USIBWC maintenance equipment.

2.2.4 Partial Levee Rerouting Alternative (Proposed Action)

To eliminate the need for a floodwall in front of the Hidalgo Historic Pumphouse, a routing modification would be made to the levee system east of the international bridge. In this reach, a new levee segment, approximately 0.7-mile in length, would be constructed along the south margin of the intake channel. Figure 2.7 shows the extent and approximate location of the partial rerouting of the Hidalgo Protective Levee System under consideration for Phase 2 of the proposed project.

The likely path of the new levee would begin near the edge of the raised levee east of the pumphouse, and continue parallel to a dirt service road that runs along the south margin of the pumphouse intake channel. The grassed area adjacent to the intake channel was formerly farmland and is currently owned by the City of Hidalgo. City property south of the channel margin transitions into the Hidalgo Bend Tract of the LRGV National Wildlife Refuge (Figure 2.7).



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PARSONS

Figure 2.5
Phase 2 No Action and Footprint Expansion Alternative

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International Boundary and Water Commission,
United States Section
September 2005

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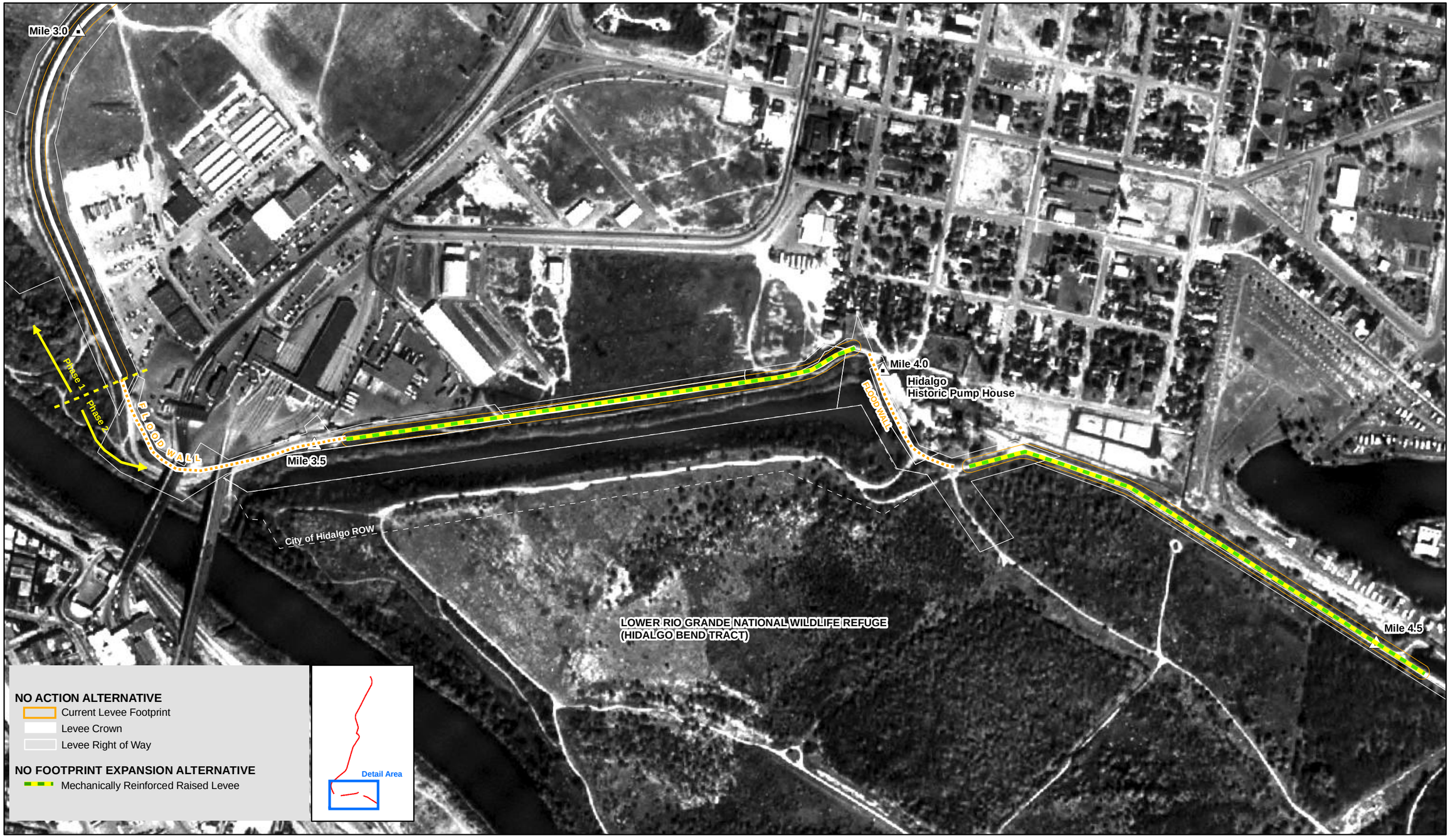

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Figure 2.6
No-Footprint Expansion Alternative

Hidalgo Protective Levee System
International Boundary and Water Commission,
United States Section
September 2005

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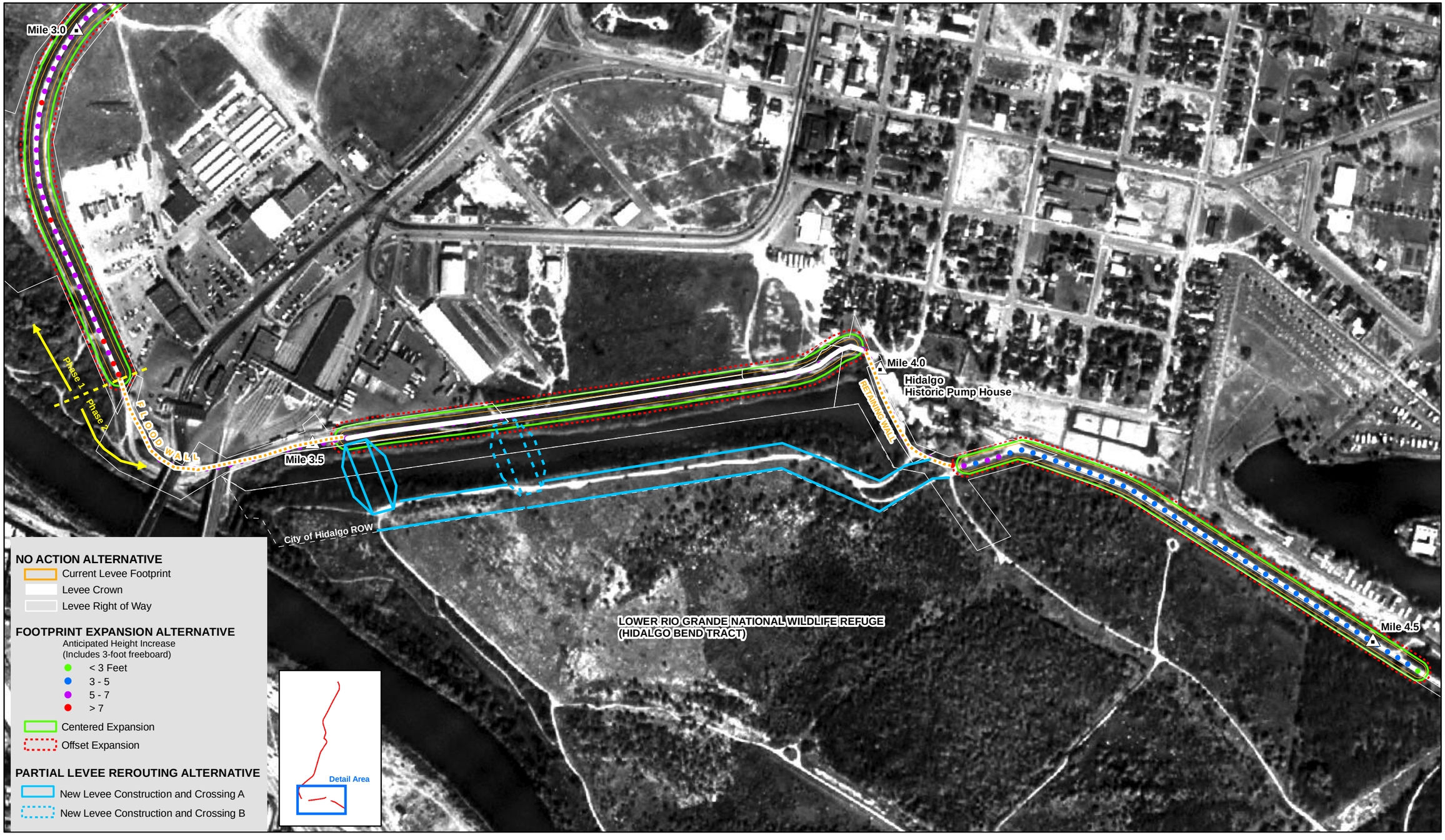

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Figure 2.7
Partial Levee Rerouting Alternative

Hidalgo Protective Levee System
International Boundary and Water Commission,
United States Section
September 2005

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The new levee would cross the intake channel to tie to the raised floodwall along the international bridge. The crossing would have an approximate elevation of over 30 feet above the normal water elevation of the intake channel. The channel opening currently runs through a culvert under an access road joining the channel south and north margins. Two potential crossing locations have been identified:

- Crossing A would be located near levee mile 3.5, near the intake channel opening into the Rio Grande. At this location, the opening of the channel is reduced to a narrow path that runs under a dirt service road connecting the bridge area and the Hidalgo Bend Tract of the LRGV National Wildlife Refuge.
- Crossing B would be located at approximately levee mile 3.7, where the Hidalgo Hike and Bike trail segment ties with the existing levee segment along the channel, requiring partial construction over open water. Relative to crossing A, however, Crossing B would have a lesser potential to restrict storm flow under the bridge, and to narrow the small wildlife corridor connecting the Pate Bend and Hidalgo Bend Tracts of the LRGV National Wildlife Refuge.

2.3 ALTERNATIVES CONSIDERED AND ELIMINATED FROM DETAILED STUDY

Two alternatives to eliminate construction of a concrete floodwall along the Hidalgo Historic Pumphouse were considered for Phase 2. Both alternatives were eliminated from further consideration as discussed below.

- Partial levee rerouting behind the Hidalgo Historic Pumphouse complex. This would limit the pumphouse's flood protection to that currently provided by the existing retaining wall. This alternative was ruled as unfeasible due to the need for extensive acquisition of commercial and residential areas for levee rerouting.
- Use of a floodwall with removable concrete panels held in place by a series of fixed columns. Removable panels would be positioned by the USIBWC operations personnel in response to large storm events. The alternative was ruled out on the bases of high cost, a need to store the concrete panels and service equipment near the floodwall location, and because it did not fully address visual impacts to the historic structure and Old Hidalgo Pumphouse Site of the World Birding Center (see Subsection 2.4.2).

2.4 OTHER ACTIONS WITH POTENTIAL CUMULATIVE IMPACTS

Complete environmental impact analysis of the alternatives must consider cumulative impacts due to other actions. A cumulative impact, as defined by the Council on Environmental Quality (40 CFR 1508.7), is the "...impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of which agency (federal or non-federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." The

USIBWC reviewed a number of reasonably foreseeable actions and determined there would be cumulative effects from two projects, the City of Hidalgo Hike and Bike Trail, and the Old Hidalgo Pumphouse Site of the World Birding Center.

2.4.1 Hidalgo Hike and Bike Trail

Most of the levee segments between the international bridge and the Hidalgo Historic Pumphouse overlap a section of the Hike and Bike Trail project under development by the City of Hidalgo with funding by the Texas Department of Transportation (levee miles 3.7 to 4.0). The project is part of the "Paseos Verdes: The Rio Trails," a regional trail system developed by the Cities of Hidalgo, McAllen, and Mission. The trail system continues east of the historic pumphouse, along the Hidalgo Protective Levee System, for approximately one-half mile, to levee mile 4.5 (corresponding to Trail Station No. 85). If constructed under current specifications, the Hidalgo Hike and Bike Trail segment along the levee would require reconstruction to increase levee height for improved flood containment.

2.4.2 Old Hidalgo Pumphouse Site of the World Birding Center and Nature Trail Project

The Old Hidalgo Pumphouse Site of the World Birding Center is a project under development by the City of Hidalgo in cooperation with the TPWD. The site will be located in city property adjacent to the Old Hidalgo Pumphouse and Museum. The project will include recreational and educational facilities, and nature trails that run along the pumphouse intake channel.

The Old Hidalgo Pumphouse Site is part of the World Birding Center, a network of nine sites along a 120-mile stretch of the Lower Rio Grande Valley, from the Gulf of Mexico to Starr County. The regional network is an initiative of the TPWD, USFWS and local communities to restore and protect native habitat along the Lower Rio Grande Valley. The World Birding Center is also intended to boost the regional economy by promoting nature tourism and educational programs for migratory bird conservation.

2.5 SUMMARY COMPARISON OF ENVIRONMENTAL CONSEQUENCES OF THE ALTERNATIVES

2.5.1 Phase 1 Alternatives

Phase 1 No Action Alternative

The Phase 1 No Action Alternative would retain the current configuration of the Hidalgo Protective Levee System, with no impacts on biological and cultural resources, land use and soil, community resources, or environmental health issues. In terms of flood protection, however, current containment capacity under the No Action Alternative may be insufficient to fully control Rio Grande flooding under severe storm events, with associated risks to personal safety and property.

Proposed Action: Phase 1 Footprint Expansion Alternative

Table 2.1 summarizes potential environmental consequences of Phase 1 Footprint Expansion Alternative, the Proposed Action. The alternative would provide improved flood protection. It would increase levee footprint from 25.6 to 36.6 acres along a 3.3-mile segment of the Hidalgo Protective Levee System, and require use of a soil borrow site of approximately 37 acres at an average excavation depth of 6 feet.

Table 2.1 Summary of Environmental Impacts for the Phase 1 Footprint Expansion Alternative

Resource Area	Phase 1 Footprint Expansion Alternative (Proposed Phase 1 Action)
Biological Resources *(Section 4.1)*	*Vegetation*. Up to 9.9 acres of grassland removal from the levee expansion corridor. Impacts to vegetation would occur in a 37-acre excavation area within the LRGV National Wildlife refuge. The loss of thorn woodland would be a significant adverse impact because removal would represent 31 percent of the quality wildlife habitat currently present in the Pate Bend Tract of the refuge. *Wildlife*. Removal of thorn woodland from borrow areas would have a negative impact on wildlife habitat. In terms of threatened and endangered species, only ocelot habitat could be affected out of 24 species whose habitat is potentially present near the levee corridor and borrow easements. Due to the ocelot's need for a greater shrub density, however, potential habitat utilization would be limited to transit corridors. *Wetlands*. Large ROW availability would allow levee footprint expansion away from the single identified wetlands area.
Cultural Resources *(Section 4.2)*	*Archaeological Resources*. Levee improvements have a low potential to impact archaeological resources; the potential for existence of significant remains in the disturbed portions of the borrow areas would be negligible as materials in these areas retain little or questionable contextual integrity. *Historical and Architectural Resources*. No historical or architectural resources are located within levee expansion areas or borrow easements.
Water Resources *(Section 4.3)*	*Flood Control*. Improvements to the Hidalgo Protective Levee System would increase flood containment capacity to control the design flood event with a minimum increase in resulting water elevation. *Water Flow*. Levee footprint expansion would not affect water bodies.
Land Use and Soil *(Section 4.4)*	*Land Use*. Some footprint extension beyond the ROW could occur. Under the riverside offset alignment, up to 1.1 acres of agricultural lands, 0.3 acre of commercial industrial, and 0.1 acre of municipal-county lands would be included within the 39.7-acre, expanded footprint. *Soil*. Estimated 37-acre excavation at an average depth of 6 feet. Potential of borrow easement use is restricted by its location within the National Wildlife Refuge. Easement vegetation, primarily thorn woodland, provides a relatively high quality wildlife habitat.
Community Resources *(Section 4.5)*	*Socioeconomic Resources*. Influx of federal funds into Hidalgo County from the levee improvement would have a positive local economic impact; the benefit, however, would be limited to the construction period and represent less than 0.2 percent of the annual county employment, income and sales values. *Environmental Justice*. No adverse impacts to disproportionately high minority and low-income populations were identified for construction activities. *Transportation*. Minimum utilization of public roads during construction; a temporary increase in access road use would be required for equipment mobilization to staging areas.
Environmental Health Issues *(Section 4.6)*	*Air Quality*. Estimated emissions for five criteria pollutants represent less than 1 percent of the Hidalgo County annual emissions inventory. *Noise*. Moderate increase in ambient noise levels through excavation and fill activities. No long-term and regular exposure is expected above noise threshold values. *Waste Storage and Disposal Sites*. A database search identified no waste storage or disposal sites within the expanded levee footprint and its vicinity.

2.5.2 Phase 2 Alternatives

Phase 2 No Action Alternative

No impacts to biological resources, cultural resources, land use and soil, community resources, or environmental health issues are anticipated under Phase 2 of the levee improvement project because the current configuration of the Hidalgo Protective Levee System would be retained. In terms of flood protection, however, current containment capacity under the No Action Alternative may be insufficient to fully control Rio Grande flooding under severe storm events, with risks to personal safety and property.

Phase 2 Proposed Action and Alternatives

Table 2.2 summarizes key features of the Partial Levee Rerouting Alternative, the Phase 2 Proposed Action, and two alternative actions: the Footprint Expansion Alternative and the No-Footprint Expansion Alternative. Table 2.3 presents a comparison of potential environmental consequences of the Phase 2 action alternatives by resource area. Key impacts identified are summarized below.

Table 2.2 Key Features of Phase 2 Action Alternatives

Measure	Unit	Phase 2 Footprint Expansion Alternative	No-Footprint Expansion Alternative	Proposed Action: Partial Levee Rerouting
Length of increased levee height	miles	1.0	0.2	0.3
New floodwalls	miles	0.25	0.30	0.15
Mechanically-stabilized levee	miles	0	0.85	0
New levee along south margin of Historic Pumphouse intake channel	miles	0.0	0.0	0.75
Intake channel crossing (35-foot centerpoint height)	miles	0.0	0.0	0.05
Soil borrow easement excavation (at 6-foot average depth)	acres	9.2	3.0	16.7
Soil borrow easement - excavation volume	cubic yards	87,954	27,800	163,029

The Phase 2 Footprint Expansion Alternative would provide improved flood protection. The alternative would require removal of up to 3 acres of thorn woodland, and use of approximately 9.2 acres of borrow site. Floodwall construction would adversely impact the setting and landscape of the Hidalgo Historic Pumphouse. Footprint expansion could extend up to 2.9 acres past the levee ROW. No adverse impacts to archaeological resources, community resources, or environmental health issues are anticipated. Mitigation actions would be implemented for borrow site use within the LRGV National Wildlife Refuge.

The No-Footprint Expansion Alternative would provide improved flood protection. The alternative would minimize vegetation removal and borrow site use. Floodwall construction would adversely impact the setting and landscape of the Hidalgo Historic Pumphouse. No adverse impacts to archaeological resources, land use, community resources or environmental health issues are anticipated. The raised concrete structure would limit potential use of the levee crown as a service road.

The Partial Levee Rerouting Alternative (Phase 2 Proposed Action) would provide improved flood protection. The alternative would require removal of up to 7 acres of thorn woodland, and up to 0.7 acres of wetlands from the intake channel. Levee rerouting would minimize adverse effects on the Hidalgo Historic Pumphouse setting. Approximately 16.7 acres of borrow site would be required. Footprint expansion could extend up to 1.1 acres past the levee ROW. No adverse impacts to archaeological resources, community resources or environmental health issues are anticipated. Mitigation actions would be implemented for borrow site use within the LRGV National Wildlife Refuge and wetlands removal. Beneficial effects are anticipated on ongoing cultural/recreational projects by City of Hidalgo and the TPWD.

Table 2.3 Environmental Impacts Summary for Action Alternatives under Phase 2 of the Levee Improvement Project

Phase 2 Footprint Expansion Alternative	No-Footprint Expansion Alternative	Proposed Phase 2 Action: Partial Levee Rerouting Alternative
BIOLOGICAL RESOURCES (SECTION 5.1)		
Vegetation		
Levee Footprint. Existing grassland along the levee and adjacent areas would be temporarily removed for the 11.7-acre expansion corridor. *Soil Borrow Easements*. Vegetation removal of up to 6 acres from an easement located within the LRGV National Wildlife Refuge. The loss of 36 acres of quality habitat from Phases 1 and 2 in combination would be a potential significant adverse impact because removal would represent 34 percent of the thorn woodland currently present in the Pate Bend Tract of the refuge. *Floodwalls*. At the Historic Pumphouse, removal of small patches of woody vegetation would be required for access and operation of construction equipment. Construction along the Hidalgo-Reynosa International Bridge would have no impacts to vegetation.	*Levee Footprint*. No impacts on vegetation are expected as levee height increase would take place along the existing levee crown. *Soil Borrow Easements*. Material can be fully obtained from grassland areas. *Floodwalls*. At the Historic Pumphouse, removal of small patches of woody vegetation would be required for access and operation of construction equipment. Construction along the Hidalgo-Reynosa International Bridge would have no impacts to vegetation.	*New Levee Segment*. Predominantly grassland vegetation would be removed from the new levee footprint ranging from 3.8 and 5.4 acres, plus an approximately 0.5 acre of thorn woodland. Up to 0.7 acres of wetlands and 2 acres of thorn woodlands would be removed along the channel crossing. *Levee Footprint*. Existing grassland along the levee and adjacent areas would be removed for the 4.6-acre expansion corridor. *Soil Borrow Easements*. Removal of up to 16.7 acres of vegetation from borrow easements #1 and #2, including 11.8 acres of thorn woodland, the primary plant community in the easements. The combined removal of thorn woodland during Phases 1 and 2 would be 44.8 acres, a potentially significant impact representing 42 percent of the high quality wildlife habitat currently available at the Pate Bend Tract of the refuge. *Floodwall*. Construction along the Hidalgo-Reynosa International Bridge would have no impacts to vegetation.
Wildlife		
Removal of up to 3 acres of thorn woodland from borrow areas would reduce wildlife habitat. Minimum impacts to threatened and endangered species are anticipated.	Minimum impacts to wildlife habitat and threatened and endangered species are anticipated as the current levee footprint would be retained.	Up to 6.8 acres of thorn woodland would be removed from borrow areas and new levee footprint moderately reducing wildlife habitat. Minimum impacts to threatened and endangered species are anticipated.
Wetlands		
No wetlands are located within the levee footprint expansion corridor or soil borrow easements.	No wetlands are located within the soil borrow easements. Levee footprint expansion is not required.	Wetlands would be removed by the intake channel crossing (from 0.5 to 0.7 acre, depending on crossing location).

Phase 2 Footprint Expansion Alternative	No-Footprint Expansion Alternative	Proposed Phase 2 Action: Partial Levee Rerouting Alternative
CULTURAL RESOURCES (SECTION 5.2)		
Archaeological Resources		
Low potential to impact archaeological resources along the levee; in the disturbed portions of the borrow areas, the potential for existence of significant remains would be negligible as materials in these areas retain little or questionable contextual integrity.	Minimum potential to impact archaeological resources as levee footprint expansion is not required.	Low potential to impact archaeological resources along the levee. Areas along the new levee path would be unlikely to retain significant archaeological remains as a major flood episode in the 1930s shifted the river channel to near its present location and may have scoured the land between the intake channel and the current course of the river. In soil borrow areas, the potential for existence of significant remains would be negligible as materials in these areas retain little or questionable contextual integrity.
Historical Resources		
Floodwall construction along the Hidalgo Historic Pumphouse has potential to physically impact the NRHP-resource, including the visual connection with the intake channel. There is also a moderate potential to physically impact the pumphouse intake channel.	Floodwall construction along the Hidalgo Historic Pumphouse has potential to physically impact the NRHP-resource, including the visual connection with the intake channel. There is also a moderate potential to physically impact the pumphouse intake channel.	By eliminating the floodwall, levee rerouting would retain the Historic Pumphouse current setting and historic landscape. The visual connection between the intake channel and the pumphouse building complex and museum would also be preserved. Crossing of the intake channel, with moderate visual impacts, would also be required.
WATER RESOURCES (SECTION 5.3)		
Flood Control		
Flood containment capacity would be increased to control the design flood event.	Flood containment capacity would increase to control the design flood event.	Flood containment capacity would be increased to control the design flood event.
Water Flow		
The alternative would not affect water bodies.	The alternative would not affect water bodies.	A flow control structure in the levee crossing would facilitate water exchange with the Rio Grande.
LAND USE AND SOIL (SECTION 5.4)		
Land Use		
The expanded footprint of 16.5 acres would potentially extend 2.9 acres into municipal-county lands, and 0.2 acre into commercial land.	No impacts as levee footprint expansion is not required.	The rerouted levee would require 4.6 acres of City of Hidalgo ROW. Footprint expansion of existing levee could extend up to 1.1 acres into municipal-county lands.
Soil		
The required excavation at a borrow easement located within the LRGV National Wildlife Refuge would be 9.2 acres at an average depth of 6 feet.	The required excavation would be 3.0 acres (average depth of 6 feet) from grassland areas of relatively low habitat value.	The required excavation at a borrow easement located within the LRGV National Wildlife Refuge would be 16.7 acres at an average depth of 6 feet.

Phase 2 Footprint Expansion Alternative	No-Footprint Expansion Alternative	Proposed Phase 2 Action: Partial Levee Rerouting Alternative
COMMUNITY RESOURCES (SECTION 5.5)		
Socioeconomics		
A small increase in employment, income and sales is anticipated as a result of the influx of federal funds. The increase would represent less than 0.05 percent of the county's annual values.	A small increase in employment, income and sales is anticipated as a result of the influx of federal funds. The increase would represent less than 0.11 percent of the county's annual values.	A small increase in employment, income and sales is anticipated as a result of the influx of federal funds. The increase would represent less than 0.13 percent of the county's annual values.
Environmental Justice		
No adverse impacts to disproportionately-high minority and low-income populations were identified.	No adverse impacts to disproportionately -high minority and low-income populations were identified.	No adverse impacts to disproportionately-high minority and low-income populations were identified.
Transportation		
Minimum public road utilization during construction; temporary increase in access road use for equipment mobilization.	Minimum public road utilization during construction; temporary increase in access road use for equipment mobilization.	Minimum public road utilization during construction; The raised concrete structure would limit potential use of the levee crown as a service road.
ENVIRONMENTAL HEALTH (SECTION 5.6)		
Air Quality		
Emissions for five criteria pollutants would represent less than 0.12 percent of the county's annual emissions inventory.	Emissions for five criteria pollutants would represent less than 0.1 percent of the county's annual emissions inventory.	Emissions for five criteria pollutants would represent less than 0.24 percent of the county's annual emissions inventory.
Noise		
Moderate increase during construction; no long-term and regular exposure above adverse-effect threshold values.	Moderate increase during construction; no long-term and regular exposure above adverse-effect threshold values.	Moderate increase during construction; no long-term and regular exposure above adverse-effect threshold values.
Waste Storage and Disposal		
No waste storage or disposal sites were identified within the expanded levee footprint and its vicinity.	No waste storage or disposal sites were identified within the levee footprint and its vicinity.	No waste storage or disposal sites were identified within the expanded levee footprint or rerouting area.
INDIRECT IMPACTS (Section 5.7)		
Hidalgo Site – World Birding Center		
Floodwall construction would obstruct the view from the Hidalgo site and direct access to the trail system along the intake channel.	Floodwall construction would obstruct the view from the Hidalgo site and direct access to the trail system along the intake channel.	Levee rerouting would allow direct access from the Birding Center and Historic Pumphouse to the trail system along the intake channel.
Hidalgo Hike and Bike Trail		
The trail segment that overlaps with the levee, approximately 1 mile, may require partial modification during Phase 2 levee construction.	The trail segment that overlaps with the levee, approximately 1 mile, may require partial modification during Phase 2.	Potential modification of the trail system along the levee during Phase 2 construction would be limited to a 0.4-mile segment.

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SECTION 3
AFFECTED ENVIRONMENT

This section describes resources in the potential area of influence of the levee construction project. The sequence of resource areas presented in this section matches the sequence used in Sections 4 and 5 to discuss environmental consequences potentially associated with Phase 1 and Phase 2 implementation, respectively. Baseline conditions are discussed in this section as follows:

- Biological resources;
- Cultural resources;
- Water resources;
- Land use and soil;
- Community resources; and
- Environmental health.

3.1 BIOLOGICAL RESOURCES

3.1.1 Vegetation

Regional Vegetation

Southern Hidalgo County is located in the Lower Rio Grande Valley (LRGV), an approximate 150-mile segment of the Rio Grande that extends from Falcon Reservoir Dam to the river opening into the Gulf of Mexico. The LRGV is part of the Tamaulipan region of southern Texas and northeastern Mexico where multiple vegetation communities and warm average temperatures provide a highly diversified wildlife habitat. Annual rainfall in the area, ranging from 16 to 35 inches, increases from west to east. Monthly rainfall is lowest in January and February, and highest in May and June.

Thorn woodland is predominant in the Tamaulipan region where areas of shallow soil and rapid drainage generally support that type of vegetation. A few species of plants account for the bulk of the brush vegetation, including mesquite, various species of acacia, desert hackberry, javelina bush, cenizo, common bee-brush, Texas prickly pear, and tasajillo or desert Christmas cactus. Parts of the region support grasslands of very diverse composition due to the highly variable soil and moisture conditions, while lines of riparian vegetation are present within the few river valleys (World Wildlife Fund, 2001). Grassland vegetation was somewhat more extensive prior to the 19th century, but continuous grazing and other factors altered the plant communities (USIBWC, 2003b).

Levee Corridor and Borrow Easement

Vegetation within a 200-foot wide levee corridor and borrow easements were evaluated in a field survey conducted in April 2005. The corridor includes all USIBWC-owned lands containing the existing levee, adjacent margins of the LRGV National

Wildlife Refuge and, to a lesser extent, city-owned property and private lands where potential impacts to vegetation would result from the levee improvement. Two USIBWC borrow easements are wholly contained within the Pate Bend Tract of the refuge.

Survey methods and findings are discussed in detail in Section 1 of a Technical Support Studies Report prepared in support of the Environmental Assessment (Parsons, 2005; an electronic CD version is attached inside the front cover of this document). Table 3.1 provides a description of four plant communities found along the survey corridor and within borrow easements: grassland, thorn woodland, wetlands and riparian, and agricultural. The distribution of plant communities along the levee corridor, including soil borrow easements, is described in half-mile intervals in Table 3.2.

Table 3.1 Plant Community Description in the Levee Corridor and Soil Borrow Easements

Community	Community Type	Description	Relative Abundance
Agriculture	Fallow	Fields that are in production a some point during the year but currently un prepped or between crops	Common
	Active agricultural fields	Typical crops include lettuce, onions, and peppers	Common
Grassland	Bufflegrass-dominant grassland	Bufflegrass is a non-native grass that provides quality grazing forage. Wildlife value is limited. Other species frequently found include bermudagrass, sand dropseed, and Johnsongrass.	Common. Bufflegrass is the dominant grass on levee slopes, and provides effective erosion control. The USFWS considers this community as low wildlife value and undesirable within adjacent refuge lands.
	Old Field	Early successional vegetation in former cultivated fields. Species include bufflegrass interspersed with some bermudagrass, Johnsongrass, sand drop seed, and prickly pear, with periodic mesquite and acacia shrubs.	Common. Large amounts of introduced species (bermudagrass, Johnsongrass *etc*.) have limited wildlife value.
Wetlands and Riparian	Emergent wetlands	Willow-cattail community	Wetlands, considered of high wildlife value, are limited within the levee improvement area. Emergent wetlands within the levee area are maintained by irrigation runoff from adjacent agricultural fields.
	Riparian sugarberry/ phragmites	Steeply sloped bank 30-45 degrees with dense woody and herbaceous vegetation.	Common community along the Rio Grande. Phragmites is considered undesirable in many cases but can provide important structure and cover for some wildlife.
Thorn Woodland	Woodland	Mixed woodland dominated by mesquite and acacia with occurrences of retama and sugarberry	Thornscrub is a valuable Lower Rio Grande Valley community whose loss to agriculture and development has resulted in the listing of several species and threatened species. The current community structure and plant density suggest that the thornscrub community would not be suitable as habitat for the ocelot.
	Parkland	Tree species limited to mesquite, interspersed with bufflegrass	

Table 3.2 Summary of Plant Community Types along the Levee Corridor and Soil Borrow Easements

	Plant Communities	
Location	**Riverside Corridor Adjacent to Levee**	**Landside Corridor Adjacent to Levee**
Phase 1 Reach		
Levee Mile 0 to 0.5	Willow-cattail riparian community along narrow wildlife corridor. Potential jurisdictional wetlands.	Mesquite acacia woodland. The USIBWC maintains a habitat conservation area.
Levee Mile 0.5 to 1.0	Willow-cattail riparian community along wildlife corridor. Potential jurisdictional wetlands.	Old field, with some agriculture.
Levee Mile 1.0 to 1.5	Mesquite woodland, interspersed with mesquite-dominant and mesquite acacia parkland, and bufflegrass dominant grassland.	Old field, with some agriculture and mixed use areas. Some agricultural areas are fallow.
Levee Mile 1.5 to 2.0	Bufflegass dominant grassland. Residential area at levee mile 1.67 near McAllen Canal. Transitions to mesquite parkland.	Fallow agricultural areas, bufflegrass dominant grassland, and some mesquite dominant woodland.
Levee Mile 2.0 to 2.5	Mesquite parkland.	Fallow field, some developed areas (mixed-use commercial/industrial).
Levee Mile 2.5 to 3.0	Mesquite parkland, mesquite acacia parkland, mesquite woodland.	Mesquite parkland, bufflegrass dominant grassland, some developed areas (mixed-use commercial/industrial).
Levee Mile 3.0 to 3.3	Mesquite parkland, mesquite acacia parkland, mesquite woodland.	Mesquite parkland, Bufflegrass dominant grassland, and multiple areas under development for mixed commercial and industrial use.
Levee Structure	Top of levee – Maintained gravel road with a narrow (10-foot) herbaceous strip dominated by buffelgrass. Slope and toe of levee – Periodically mowed, herbaceous community dominated by buffelgrass, bermudagrass, and sand dropseed. In many areas the toe of the levee is marked by dirt roads used by the U.S. Border Patrol.	
Borrow Easement #1 (Levee miles 1.7 to 2.2)	Mesquite acacia woodland, mesquite acacia parkland. Bufflegrass is predominant in the grassland.	
Phase 2 Reach		
Levee Mile 3.3 to 3.5 (along Hidalgo-Reynosa International Bridge)	Retaining wall from levee mile 3.3 to 3.5. Mesquite parkland, mesquite acacia parkland, mesquite woodland.	International border station.
Levee Mile 3.5 to 4.0	Mesquite acacia parkland. Phragmites-sugarberry community along canal.	Hidalgo Historic Pumphouse at levee mile 4.0 to 4.1; bufflegrass dominant grassland.
Levee Mile 4.0 to 4.5	Mesquite woodland, mesquite parkland.	Single-family residential housing.
Levee Rerouting Area (south of intake channel)	Bufflegass dominant grassland. Mesquite acacia parkland, and mesquite woodland along the intake channel margin. Potential jurisdictional wetlands area.	
Borrow Easement #2 (Levee miles 3.0 to 3.2)	Mesquite parkland, mesquite acacia parkland, and mesquite woodland.	

The acreage of four plant communities found along the 200-foot wide survey corridor and within borrow easements was quantified based on results of the April 2005 field survey (Parsons, 2005). Acreage data presented in Table 3.3 indicate that grassland and thorn woodland are the predominant plant communities in the levee corridor, comprising an approximate 60 percent and 25 percent of the acreage, respectively.

In USIBWC soil borrow easements, located wholly within the Pate Bend Tract of the LRGV National Wildlife Refuge, thorn woodland is the predominant community, representing 90 percent of easement #1 acreage, and 50 percent of easement #2. The two easements in combination contain nearly half of the tract's 106 acres of thorn woodland (Table 3.3).

Table 3.3 Acreages of Plant Community Classes within the 200-Foot Wide Levee Corridor and within Soil Borrow Easements

Plant Community	Existing Levee Corridor (acres)	Levee Rerouting Area (acres)	Soil Borrow Easements (acres)
Grassland	38.8	7.8	4.8
Thorn Woodland	16.6	1.1	50.2
Wetlands and Riparian	8.3	0.4	0.0
Agricultural	2.1	0.0	0.0
Total	**65.8**	**9.3**	**55.0**

3.1.2 Wildlife

Regional Wildlife

From a regional perspective, the proposed levee improvement area is located within the Lower Rio Grande Valley. The levee corridor and borrow easements are located adjacent and within the Pate Bend and Hidalgo Bend Tracts of the LRGV National Wildlife Refuge, part of a 44-tract holding by the USFWS that comprises nearly 10,000 acres. The LRGV National Wildlife Refuge is a component of a multi-partner effort attempting to connect and protect blocks of habitat, known locally as Wildlife Corridor (USFWS, 2005). The Wildlife Corridor partnership includes USFWS, TPWD, National Audubon Society, The Nature Conservancy, and private owners, and extends over 25,000 acres within Hidalgo County. Additional blocks of habitat are located in Cameron, Willacy, and Starr Counties (USIBWC, 2003b).

Common LRGV wildlife species include whitetail deer, turkey, javelina, bobwhite quail, scaled quail, white-winged dove, mourning dove, cottontail rabbit, jackrabbit, waterfowl, and a variety of nongame birds. The region also provides important wintering habitat for thousands of migratory birds, including many species of passerines, raptors, sandhill cranes, ducks, and geese. In addition to the more common wildlife species, a number of unique and rare animals occur in the region (World Wildlife Fund, 2001). The

distribution of many wildlife species is limited, either partially or entirely, to the Tamaulipan Biotic Province, and some are found exclusively within the LRGV.

There are approximately 67 mammals of potential occurrence in the LRGV, including federal listed species, such as the Jaguarundi and ocelot. The mammals are dominated by rodents (24 species) and bats (13 species). Some common mammals which may be encountered in the LRGV are the common raccoon, striped skunk, coyote, Mexican ground squirrel, and the bobcat, beaver and nutria (USIBWC 2003b).

There are approximately 500 species of birds that potentially occur in the LRGV. The dominant numbers of bird species are represented by wood warblers (44 species), geese and ducks (30 species), sparrows and towhees (26 species), raptors (25 species), and tyrant flycatchers (25 species). Many species pass through the LRGV on their way to summer breeding or wintering grounds because of the convergence of the Central and Mississippi Flyways. The LRGV is the point where many tropical birds reach their northernmost ranges (Fermata, 2003).

Amphibians and reptiles are also well represented in the LRGV. There are approximately 76 species of reptiles and amphibians that potentially occur in Hidalgo County. The reptiles consist of snakes (29 species), lizards (19 species), turtles (six species), and one crocodile. The amphibians consist of frogs and toads (18 species), and three species of salamanders (USIBWC, 2003b).

Levee Corridor and Borrow Easement

High quality wildlife habitat in the levee corridor vicinity is found primarily within two tracts of the LRGV National Wildlife Refuge that comprise more than 50 percent of the riverside boundary along the Hidalgo Protective Levee System (Figure 2.1). From levee mile 1.6 to 3.5, the levee margin is adjacent to the Pate Bend Tract of the refuge; farther east, from levee mile 4.1 to 4.5, the flood control system borders the Hidalgo Bend Tract. The size of the two refuge tracts has been reported at 442 acres and 536 acres, respectively (USIBWC 2003b). Both tracts were formerly agricultural lands where extensive grassland areas are intermixed with thorn woodland.

Plant communities considered quality habitat by the USFWS include thorn woodlands and wetlands/riparian. Grassland habitat and former agricultural sites are dominated by non-native species (primarily bufflegrass) considered as low value habitat. Refuge management strategies include replacing non-native grassland and former agriculture areas with thorn woodland.

In addition to refuge land, a small habitat conservation area, approximately 2 acres in size, is located landside at the north end of the levee system within USIBWC land. Along the same levee segment, on the river side (opposite to the habitat conservation area), a narrow 30-foot wide corridor was created by USIBWC for the purpose of providing a vegetated corridor. Although extremely narrow, the corridor receives irrigation tailwater and supports wetland conditions.

3.1.3 Threatened and Endangered Species

The potential presence of habitat for federal and state-listed threatened and endangered (T&E) species was analyzed based on vegetation survey data and habitat requirements for species potentially occurring within the vicinity of the levee corridor and borrow easements. The likelihood of occurrence of preferred habitat types for each T&E species potentially occurring in Hidalgo County was assessed based on habitat types identified during field surveys, as follows:

- *Not Likely Present*: no suitable habitat identified;
- *Potentially Present*: habitat present but no records of species occurrence in the vicinity;
- *Likely Present*: habitat present and species are known to occur in the vicinity; and
- *Present*: observed.

A list of federal and state-listed T&E species found within Hidalgo County was provided by the TPWD and USFWS in response to an April 11, 2005 USIBWC consultation letter (see Appendix A). The county list was evaluated for the potential presence of habitat for those species within the vicinity of the levee corridor and borrow easements. Table 3.4 summarizes results of the evaluation of potential presence of habitat. A detailed analysis is provided in Section 2 of the Technical Support Studies Report prepared in conjunction with this Environmental Assessment (Parsons, 2005; an electronic CD version is attached inside the front cover of this document).

3.1.4 Jurisdictional Wetlands and Aquatic Habitat

Figure 3.1 indicates the location of two wetlands identified during field surveys as potentially meeting the criteria of jurisdictional waters of the United States. Wetlands delineation procedures and results are presented in Section 3 of the Technical Support Studies Report prepared in conjunction with this Environmental Assessment (Parsons 2005; an electronic CD version is attached inside the front cover of this document).

Wetlands A. Wetlands A is a 0.52-acre area emergent wetlands community located in the northern portion of the Hidalgo Protective Levee System. It runs parallel to the levee along a drainage ditch located within the USIBWC wildlife corridor. Vegetation communities include a willow-cattail riparian community, with some areas dominated completely by cattail. Most of the ditch within this wildlife corridor is permanently flooded, but moist soil areas are exposed within the channel toward the southern portion of the wetlands.

Wetlands B. Wetlands B is an emergent vegetation and open water area within the channel connecting the Hidalgo Historic Pumphouse to the Rio Grande. It is within a riparian sugarberry/phragmites community bounded to the north and south by steep sloped terrain. Water flows into Wetlands B through two 48-inch culverts from the Rio Grande during high flow regimes. Average width of Wetlands B is approximately

30 feet. Open water habitat accounted for 1.53 acres of the 2.41-acre wetlands area delineated during the April 2005 field survey.

Table 3.4 Threatened and Endangered Species Potentially Occurring within the Levee Corridor and Borrow Easements

Common Name	Scientific Name	Listing Status		Required Habitat
		Federal	State	
Texas ayenia	*Ayenia limitaris*	E	E	Plant species found on terraces and floodplains, where habitat is dense, and in moist riparian woodland with thick canopy cover. This plant may be dependent on periodic flooding for nutrient deposition and seed dispersal. Associative plants include mesquite, grenjeno, lote brush, and snake-eyes.
South Texas siren	*Siren* spp.	-	T	May be found in wet or semi-wet areas, such as arroyos, canals, ditches, or even shallow depressions; aestivates in the ground during dry periods.
Mexican treefrog	*Smilisca baudinii*	-	T	Subtropical region of extreme southern Texas, breeding coincides with rainy months, usually May –October. Eggs are laid in temporary rain pools. Recently observed in woodland habitat 10-20 miles downstream at Santa Ana National Wildlife Refuge (USFWS, 2005b).
Texas horned lizard	*Phrynosoma cornutum*	-	T	Open arid or semi-arid regions with sparse vegetation, grass, cactus, scattered brush or scrubby trees, burrows into soil, utilizes rodent burrows or hides under surface litter. Species observed in recent years within the Hidalgo Bend Tract of the LRGV National Wildlife Refuge (USFWS, 2005b).
Texas tortoise	*Gopherus berlandieri*	-	T	Open scrub woods, arid brush, lomas, grass cactus association, open brush with grass understory preferred; shallow depressions at base of bush or cactus or underground burrow or hides under surface cover. Recently observed in the Hidalgo Bend Tract of the LRGV National Wildlife Refuge (USFWS, 2005b).
Cactus ferruginous pygmy-owl	*Glaucidium brasilianum cactorum*	-	T	Riparian corridors and mesquite thickets; roosts in small caves and recesses on slopes of low hills during the day; breeds April – August. Presently known in woodland habitat in Bentsen State Park (USFWS, 2005b).
Gray hawk	*Asturina nitidus*	-	T	Mature woodlands of river valleys and adjacent semiarid mesquite and scrub grasslands. Species occurs in nearby tracts of the LRGV National Wildlife Refuge (USFWS, 2005b).
Hook-billed kite	*Chondrohierax uncinatus*	-	T	Dense tropical and subtropical forests, but does occur in open woodlands, uncommon to rare in most of its range. Species occurs in nearby tracts of the LRGV National Wildlife Refuge (USFWS, 2005b).
Rose-throated becard	*Pachyramphus aglaiae*	-	T	Riparian corridors and mesquite thickets, open forest, and mangroves; breeds April – July. Species occurs in woodland habitat in Santa Ana National Wildlife Refuge (USFWS, 2005b).

Common Name	Scientific Name	Listing Status		Required Habitat
		Federal	State	
Black spotted newt	*Notophtalmus meridionali*	-	T	Amphibian species that may be found in wet or semi-wet areas, such as arroyos, canals, ditches, or even shallow depressions; aestivates in the ground during dry periods.
American alligator	*Alligator mississipiensis*	T	-	Large streams, canals, ponds, lakes, and swamps.
Black-stripped snake	*Coniophanes imperialis*	-	T	Extreme south Texas; semi-arid coastal plain, sandy soil; eggs laid April through June.
Indigo snake	*Drymarchon corais*	-	T	Thornbrush-chaparral woodlands, dense riparian corridors, can be successful in suburban and irrigated croplands, requires moist microhabitats such as rodent burrows for shelter.
Northern cat-eyed snake	*Leptodeira septentrionalis*	-	T	Thorn brush woodlands, dense thickets bordering ponds and streams, semi-arboreal, nocturnal.
Reticulate collard lizard	*Crotaphytus reticulates*	-	T	Open brush grasslands; thorn-scrub vegetation, usually on well drained gravelly or sandy soil.
American peregrine falcon	*Falco peregrinus anatum*	DL*	E	Potential migrant, nests in west Texas.
Arctic peregrine falcon	*Falco peregrinus tundrius*	DL*	T	Potential migrant.
Interior least tern	*Sterna antillarum athalassos*	E	E	Nests along sand and gravel bars with braided streams, rivers, inland channels, and some lakes.
Northern beardless-tyrannulet	*Camptostoma imberbe*	-	T	Mesquite woodlands in close to the Rio Grande, frequents cottonwood, willow, elm, and great leadtree. Breeds April through July.
Texas Botteri's sparrow	*Aimophila botterii texana*	-	T	Grassland plains or parklands with scattered bushes or shrubs, sagebrush, mesquite, or yucca. Rests on ground in low clumps of grasses.
Tropical parula	*Parula pitiayuma*	-	T	Dense woodlands or parklands, riparian corridors, shrublands with dense underbrush. Breeds April – July.
Coues' rice rat	*Oryzomys couesi*	-	T	Cattail marsh, cattail-bulrush marsh, with a shallower zone of emergent grasses; shade trees around shoreline. Breeds April – August.
Gulf Coast jaguarundi	*Felis yagouaroundi cacomitli*	E	E	Dense, thorny thickets in southern Texas with proximity to a water source. Cacti, mesquite, cat claw, grenjeno, and other spine-studded vegetation often characterize habitat.
Ocelot	*Felis pardalis*	E	E	Dense, thorny thickets in southern Texas with proximity to a water source. Spiny hackberry, lotebrush, blackbrush, and mesquite characterize habitat where a line of sight is limited to approximately 5 feet. The current thorn woodland density of borrow areas and lands adjacent to the levee corridor is not consistent with ocelot requirements (Parsons, 2005).
Southern yellow bat	*Lasiurus ega*	-	T	Associated with sabal palms near Brownsville, ranges far for insects. Breeds in late winter.

DL: under consideration for delisting.

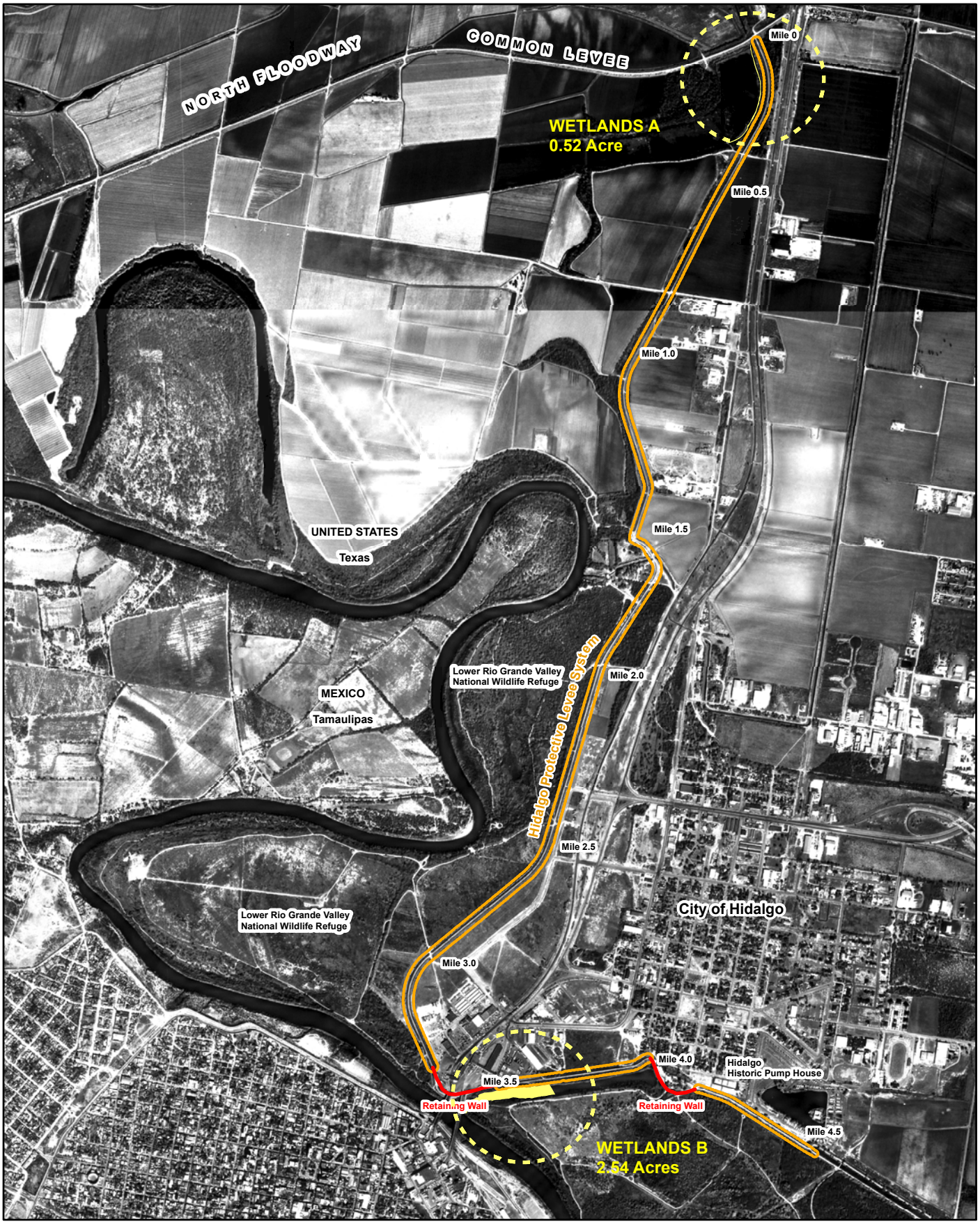

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Figure 3.1
Location of Potential Jurisdictional Wetlands

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3.2 CULTURAL RESOURCES

3.2.1 Archaeological Resources

The proposed project lies within the Los Caminos del Rio Heritage Project corridor, an area of regional, national, and international significance (Sánchez 1994). Archaeological sites sealed under rapidly deposited soil could retain a high degree of integrity and provide important understanding of the history of Caminos del Rio corridor. The upper soil strata are modern in this area along the Rio Grande, the upper 10 feet generally being no more than a few hundred years old, although minor areas of older soils do exist. In some areas, the upper soil can be up to several thousand years old (Cooper, *et al*. 2002:91).

Previous research has been conducted to determine the potential for archaeological sites along the LRGFCP (Cooper, *et al*. 2002). Areas noted by Cooper, *et al*. (2002) to have a high potential for archaeological resources (designated high probability areas [HPA]) within the levee corridor include the following, shown in Figure 3.2.

- HPA-1, an area where structures are denoted on a 1916 map—Cooper, et al. (2002: Figure 4) identifies this as 16HI2.
- HPA-2, an area where numerous structures are denoted on a 1916 map - Cooper, et al. (2002: Figure 4) identifies this as 16HI4.

No areas were identified by Cooper *et al.* (2002) that were considered to be high probability for the occurrence of prehistoric archaeological sites although they do state that areas of historic occupation sometimes contain a prehistoric component because prehistorically utilized landform surfaces were also considered desirable living surfaces by European settlers (Cooper et al. 2002:94). Therefore, the historic HPAs designated above should also be considered as possible locations for prehistoric archaeological sites.

A review of the Texas Archeological Sites Atlas identified no previously identified archaeological sites in the Hidalgo Protective Levee System, either along the levee corridor or within a half mile of the existing levee. It should be noted, however that no systematic archaeological surveys have been undertaken in this area.

3.2.2 Architectural and Engineering Resources

Spanish colonization of the area began in 1749, when tracts known as *porciones* were allotted to settlers who typically undertook ranching, small scale agriculture, and subsistence farming (Weitze, 1992). After the end of the Mexican War in 1848, land acquisition from the original grantee descendents began and the land was consolidated into larger parcels. Some of the first settlements and small towns on the north side of the Rio Grande in Hidalgo County were established during this post-war period, but land use in general continued to focus on ranching. Land in the region was described as "...an arid wasteland of mesquite and brush useful only for grazing livestock by the scattered ranch families who made their living on the land." (Weitze, 1992).

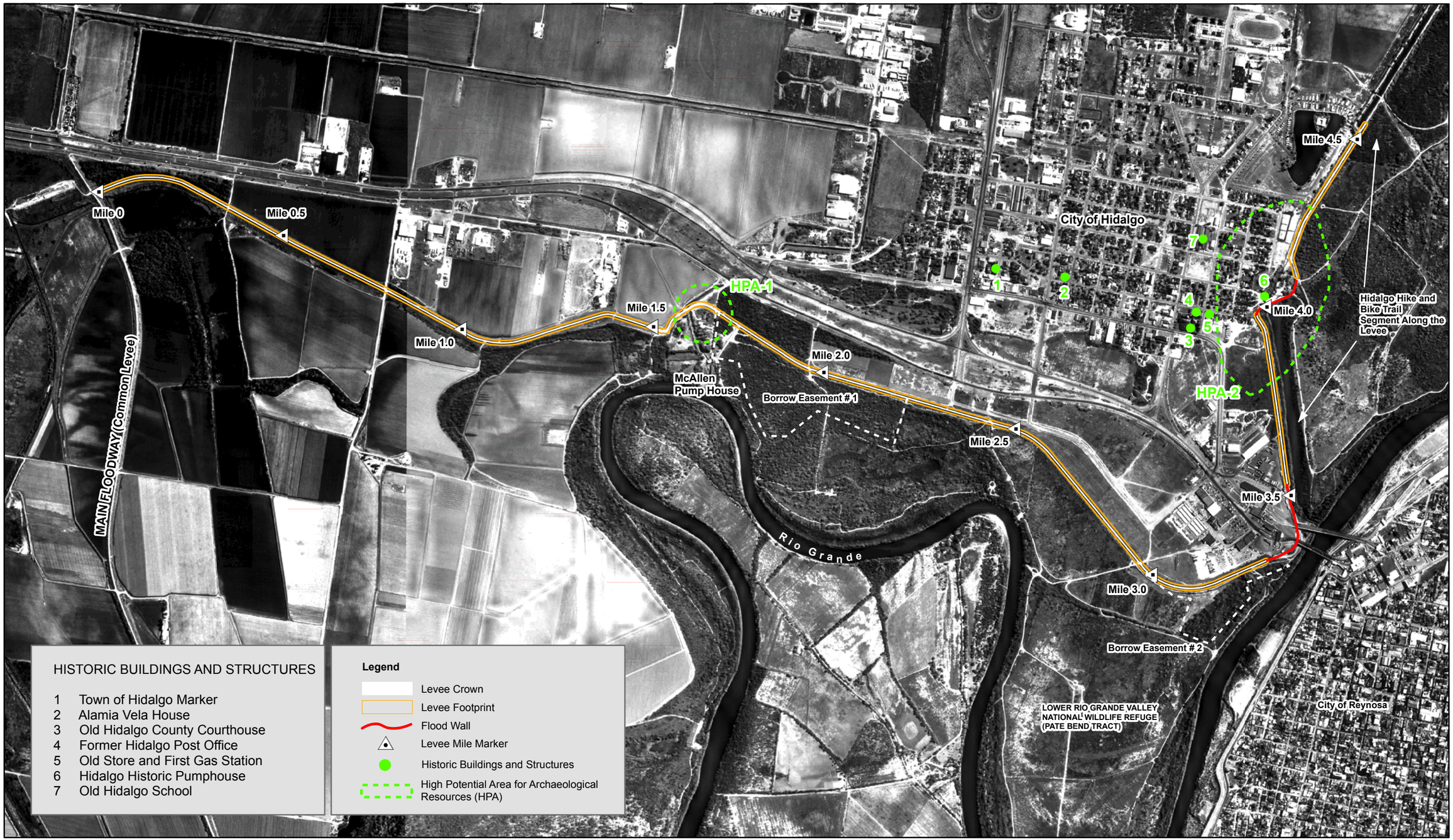
Near the end of the 19th century, Anglo settlers began experimenting with agriculture and irrigation in the valley, and the new arrivals often had ambitions of large-scale development. "They financed rail transportation, built the first mechanized irrigation pumping stations and canals, platted townsites, and promoted their lands in an effort to develop the agricultural potential of the valley. They laid the groundwork for the 40-acre farms that sprang up in the first half of the 20th century." (Weitze, 1992). In 1893, William Chatfield visited Hidalgo and noted it was the only town worth mention between Rio Grande City and Brownsville (Weitze, 1992).

Regional development was accelerated by construction of the St. Louis, Brownsville, and Mexico Railroad in the valley during the first decade of the 20th century (Lower Rio Grande Valley Development Council, 1978). One of the development efforts of the early 20th century was that of the Louisiana-Rio Grande Canal Company, which constructed the irrigation system that included the Hidalgo Historic Pumphouse discussed below.

Previous research has been conducted to determine if historic buildings and structures are known to be present along the LRGFCP (Cooper, *et al*. 2002), and a visit to the proposed levee improvement area was conducted on February 28, 2005 by an architectural historian with LGGROUP. Historic resources are provided in the bulleted list, below. The first four are provided by Cooper, *et al.* (2002). The last three were identified during the background research and visit to the proposed levee improvement area. Figure 3.2 shows the location of these historic buildings and structures. Town of Hidalgo marker, a 1936 Texas Centennial Highway Marker, itself eligible for consideration as a historic object.

1. Alamia-Vela House, identified as a resource of local significance; its eligibility for inclusion in the National Register of Historic Places (NRHP) and as a Texas State Archeological Landmark has not been assessed.
2. Old Hidalgo County Courthouse and associated buildings (Recorded Texas Historic Landmark [RTHL]).
3. Former Hidalgo Post Office (RTHL).
4. Rodriguez Store, the first gas station in the City of Hidalgo.
5. Hidalgo Historic Pumphouse (NRHP, RTHL).
6. Old Hidalgo School (NRHP, RTHL).

A particularly important consideration is the Hidalgo Historic Pumphouse, part of an NRHP historic district known as the Louisiana-Rio Grande Canal Company Irrigation System. The irrigation system is a National Historic Landmark that is part of the Los Caminos del Rio Heritage Project (Weitze 1992). The system is comprised of the first-lift pumphouse (the Hidalgo Irrigation Pump Plant, adjacent to the intake canal on the Rio Grande), the second-lift pumphouse (about 7 miles northeast, near McAllen), and the above- and below-ground canal system (Weitze 1992). The period of significance for the Louisiana-Rio Grande Canal Company Irrigation System extends from 1904 through 1949, when a severe freeze caused severe damage to citrus trees and greatly diminished citrus production in the area (Weitze 1992).



Scale = 1 : 15,000

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Figure 3.2
Areas of Known or Potential Cultural Resources

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This irrigation system had an enormous impact on the character of development in the proposed levee improvement area. "Water pumped from the river converted vast tracts of former ranchland into a patchwork of 20- to 80-acre irrigated orchards and truck gardens in the 1910s and 1920s." (Weitze 1992). The landscape eventually served by this irrigation system covered approximately 45,000 acres during the period of significance associated with this historic resource (Weitze 1992).

The Louisiana-Rio Grande Canal Company Irrigation System reflects both the initial system layout and the technological advances of the period, such as modernization of the pumps and concrete lining of the open earthenwork canals. The alignment of the main intake canal and its major laterals has not changed since its original design barring one exception, that of Lateral D, removed for construction of a road in the late 1920s. Weitze (1992) notes that the "...canal system alignment remains essentially as engineered in 1909-1935, with 80 miles of earthen canals, 32 miles of concrete lined canals, and 200 miles of underground irrigation pipe 12 to 60 inches in diameter. An aggregate of 120 miles of drainage ditches and 85 miles of pipe drains are also contributing to the system. The 260 miles of privately owned pipe drains, as well as the changing alignments of private field irrigation ditches, are noncontributing." The irrigation system is significant at the state level under NRHP Criterion A for contributions to 20th century agriculture in the LRGV. The Hidalgo Historic Pumphouse was nominated under Criterion C for architectural and engineering significance because of the retention of its original Mission Revival facade and steam pumping machinery (Weitze 1992).

3.3 WATER RESOURCES

3.3.1 Flood Control

Lower Rio Grande Flood Control Project

In 1932, an agreement was reached between the United States and Mexico to develop a coordinated plan for an international project to protect the Lower Rio Grande Valley (LRGV) in both countries against flooding from the Rio Grande. This agreement, which later resulted in the LRGFCP, was developed by the IBWC. The USIBWC and MxIBWC sections are each responsible for meeting treaty obligations within their national boundaries.

The LRGFCP is designed for flood protection of urban, suburban, and highly developed irrigated farm lands in the Rio Grande delta in both countries. The LRGFCP flood levees are grass-covered earthen structures, with a distance between the U.S. and Mexican levees ranging from approximately 400 feet to 3 miles (USIBWC, 1992). The LRGFCP is jointly operated by the USIBWC and MxIBWC to convey excess floodwaters of the Rio Grande to the Gulf of Mexico through the river and United States and Mexican interior floodways.

The LRGFCP facilities on the United States side are located in Hidalgo, Cameron, and Willacy Counties, Texas, with the river levee beginning near the Town of Peñitas at the head of the delta, about 180 river miles from the Gulf of Mexico. The United States

interior floodway system is flanked by 168 miles of levees covering the natural channel of the Arroyo Colorado, and 102 miles of levees along the Rio Grande (USIBWC 1980).

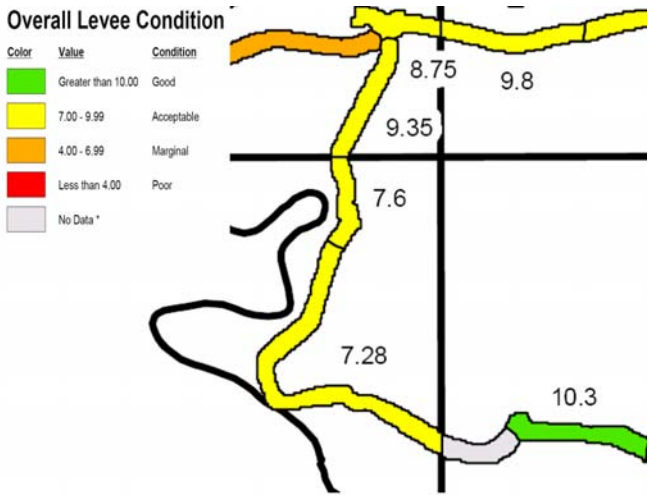
The LRGFCP includes the Anzalduas Diversion Dam, completed in 1960, and the Retamal Diversion Dam, completed in 1973. Ownership of Anzalduas and Retamal Dams is a joint responsibility by the United States and Mexico via the International Boundary and Water Commission, United States and Mexico. Operation and maintenance is shared equally among both countries via the respective sections.

The design flood for the LRGFCP is based on a peak flow of 250,000 cubic feet per second (cfs) at Rio Grande City, which attenuates to 235,000 cfs at Peñitas. During the design flood, Anzalduas Diversion Dam and Retamal Diversion Dam will each divert 105,000 cfs into the United States and Mexico, respectively. Flow diversion during the design flood will limit flood flows through the Brownsville-Matamoros area to 20,000 cfs. The USIBWC and MxIBWC coordinate operation of these dams to ensure both dams divert equal flows into the respective countries during significant flood events.

Hidalgo Protective Levee System

The Hidalgo Protective Levee System is a 4.5-mile segment of the LRGFCP that runs along the west and south boundaries of the City of Hidalgo. The upstream end of the levee system begins at its junction with the LRGFCP Main Floodway levee located just south of the City of McAllen. The levee system was recently evaluated by the USIBWC in terms of both, structural condition and flood containment capacity.

Structural Condition. A recent structural integrity assessment of the LRGFCP levee system identified no structural deficiencies in the Hidalgo Protective Levee System. The diagram below presents an overview of the levee condition based on detailed results reported in the document *Condition Assessment of the U.S. International Boundary and Water Commission, Lower Rio Grande Valley Levees, South Texas* prepared in October 2003 for the USIBWC by the USACE, Engineer Research and Development Center (USACE 2003). Reported values for the Hidalgo Protective Levee System fall within the 7.0 to 9.99 Acceptable category range.



Flood Containment Capacity. The current Hidalgo Protective Levee System does not meet design criteria for the design flood event. The need for improvements to the 4.5-mile levee system was determined by hydraulic modeling conducted by the USIBWC, as reported in the document *Hydraulic Model of the Rio Grande and Floodways Within the Lower Rio Grande Flood Control Project, June 2003*. The study updated findings of a prior 1992 study by incorporating new structures and geometrical data, as well as changes due to land use and agricultural practices, and increased reliability of the hydraulic model with enhanced software capabilities. For the 4.5-mile Hidalgo Protective Levee System, the USIBWC hydraulic study indicated that an increase in the levee height from 3 to 9 feet would be required to meet design criteria for flood protection. The criteria require a levee freeboard of 3 feet above anticipated water level during the design flood event.

Anticipated height increases by levee segment were previously provided in Section 2 by 1-mile segments (Figures 2.2, 2.3, 2.4 and 2.5. Tabulated values at 1/100th mile intervals are provided in Section 4 of the Technical Support Studies Report prepared in conjunction with this Environmental Assessment (Parsons, 2005; an electronic CD version is attached inside the front cover of this document).

3.3.2 Water Flow

Flow of the Rio Grande is highly variable and tightly managed. Along the LRGFCP, including the Hidalgo area, the flow is dictated by the needs of agriculture and crop watering schedules. Low water flow conditions characterize the river, with minimum values from September to February. Severely reduced flows occur frequently due to increased water demands from a growing urban and industrial population, reduced riparian habitat and ground cover, proliferation of exotic aquatic vegetation, and recent drought conditions. Rio Grande water is currently fully allocated with agricultural use constituting 82 to 90 percent of the water in the LRGV (USIBWC, 2002).

Two other factors that impact flow in the Rio Grande are water storage and storms. There are two large international reservoirs on the lower Rio Grande, International Amistad Reservoir, near Del Rio, Texas, and International Falcon Reservoir, near Zapata, Texas. These reservoirs store water for agricultural use, public water supply, and recreational activities, and provide storage capacity for control of floods. Storm water is managed by 270 miles of levees that channel flow into and out of diversions and floodways. During non-flood conditions, irrigation/municipal water and local drainage flow into the floodways through approximately 500 irrigation and drainage structures.

The single water resource located within the potential area of influence of the Hidalgo Protective Levee System corridor is the intake channel of the Hidalgo Historic Pumphouse. During operation of the pumphouse, the intake channel was actively connected to the lower Rio Grande. Currently the channel only sporadically exchanges water with the Rio Grande during high flow conditions through a small drainage ditch that runs under a service road through two 48-inch culverts. The existing levee system runs parallel to the north margin of the channel. Potential effects of levee rerouting across the channel as part of Phase 2 construction are discussed in Section 5.

3.4 LAND USE AND SOIL

3.4.1 Land Use

Current land use along the Hidalgo Protective Levee System was quantified along a corridor potentially affected by the levee improvement project (Figure 3.3). Table 3.5 presents the estimated acreage within a 1000-foot corridor (500 feet on each side of the levee centerline). The greater land use within the corridor is represented by the levee ROW under USIBWC jurisdiction (23% of the corridor), and the LRGV National Wildlife Refuge (30% of the corridor). Agricultural and residential uses represent 22 percent and 15 percent, respectively. Other uses are commercial/industrial and municipal lands, located primarily in the south section of the levee system (Phase 2 construction). Municipal lands include the Hidalgo Historic Pumphouse and adjacent land to be developed in conjunction with the TPWD as a birding center, both owned by the City of Hidalgo, and the Hidalgo-Reynosa International Bridge and border station, owned by the City of McAllen. Two soil borrow easements are located entirely within the LRGV National Wildlife Refuge.

Table 3.5 Land Use along the Potential Area of Influence of the Levee Corridor

Use	Jurisdiction	Acreage	Percent
Agricultural	Irrigation district / private ownership	125	22
Commercial/industrial	Private ownership	39	7
Residential	Private ownership	84	15
Municipal (historic pumphouse, parks, and international bridge and border station)	Cities of Hidalgo and McAllen	15	3
Federal – Levee ROW	USIBWC	130	23
Federal – Wildlife Refuge	USFWS	161	30
Major Roads	County and State	12	2
Total		**574**	**100**

3.4.2 Soil

Hidalgo County topography is nearly flat to gently sloping. Elevations range from 40 feet above mean sea level (amsl) on the eastern portion of the county, to 375 feet amsl on the western side (SCS, 1981). Ground elevation along the levee toe typically ranges from 100 to 110 feet amsl. General drainage near Hidalgo is southeast, toward the Rio Grande floodplain.

The geology of the proposed levee improvement area consists mainly of alluvium and terrace deposits with some sandstone and clay outcrops. The alluvium deposits are divided into sections that are predominantly mud, silt, and sand, or a combination of all three. The sand is mostly quartz and the silt is dark gray to dark brown and calcareous. The fluvial terrace deposits are composed of gravel, sand, silt, and clay, similar in composition to the contiguous alluvium (USIBWC, 2003b).

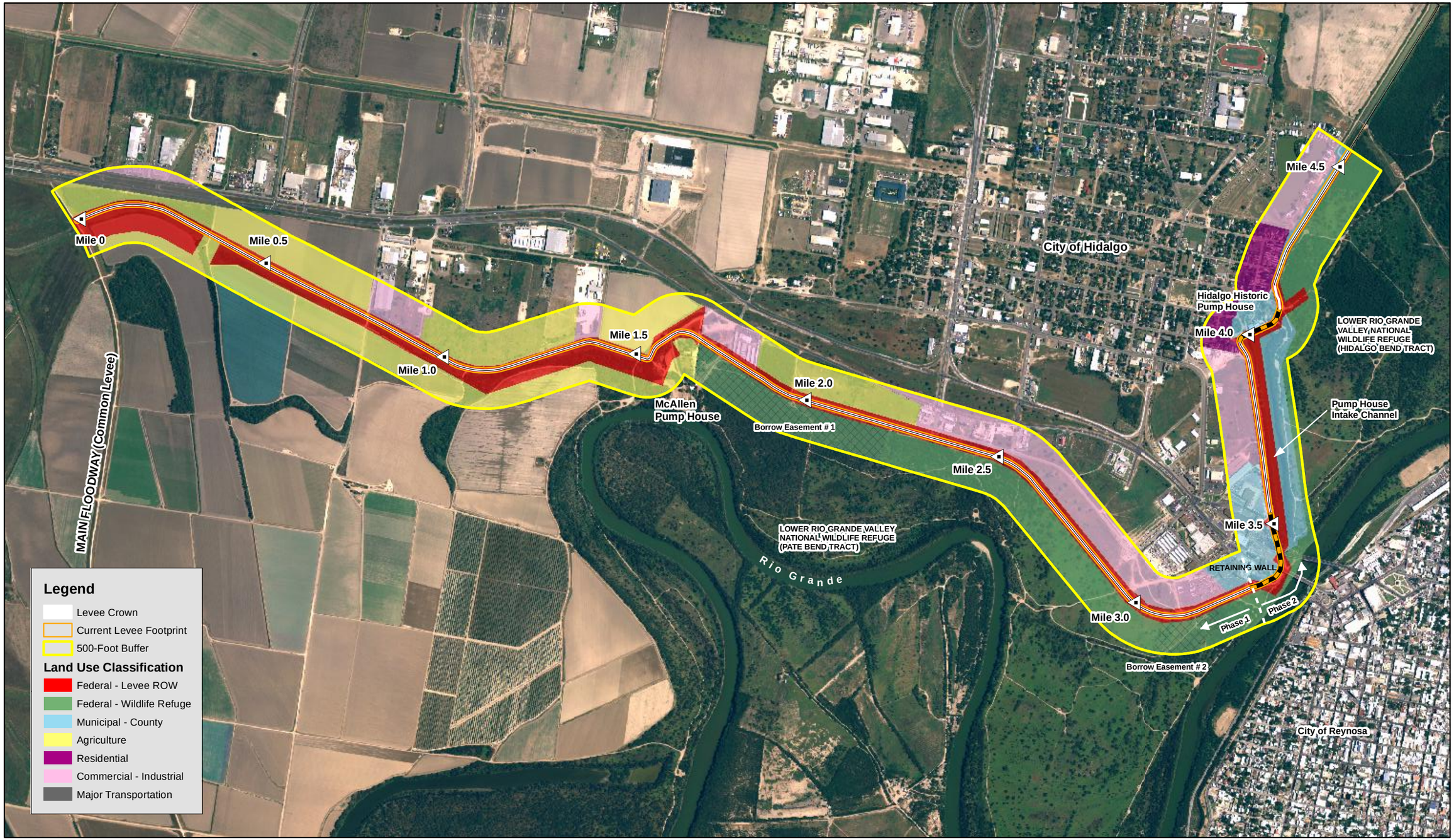


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Figure 3.3
Land Use Classification in the
Levee System Vicinity

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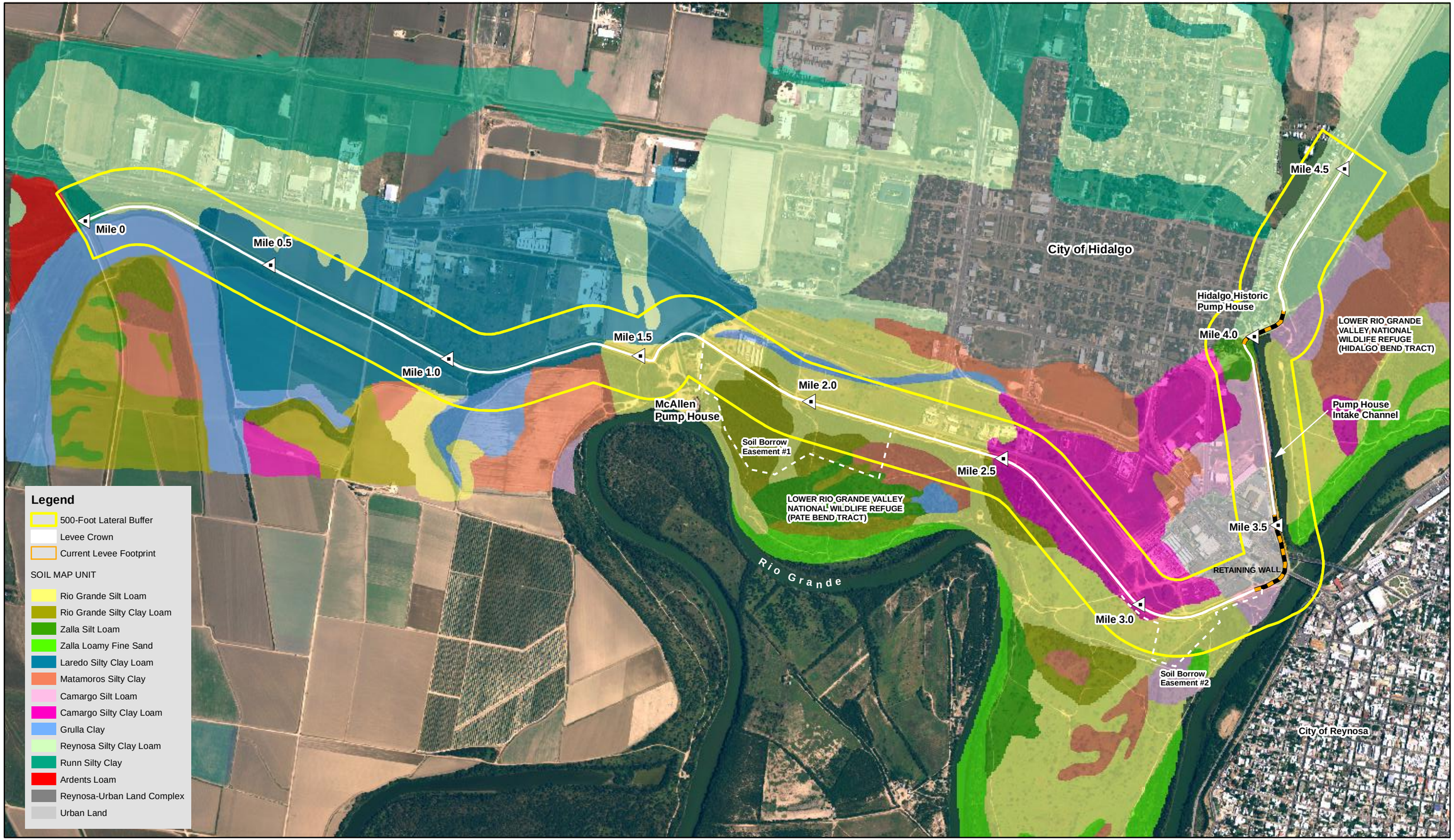

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Figure 3.4
Predominant Soils in the
Levee System Vicinity

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Soil in southern Hidalgo County is classified by the National Resources Conservation Service as part of the Rio Grande-Matamoros Unit (SCS, 1981). This soil is reported as deep, moderately well drained, and with moderate or slow permeability. Rio Grande soil makes up about 42 percent of the unit; Matamoros soil 24 percent; and Camargo, Grulla, and Zalla soil 34 percent (SCS, 1981). Rio Grande soil, typically located in the higher ground elevations, has a light brownish gray silt loam surface about 8 inches thick. The underlaying material to a depth of 65 inches is brown silt loam, silty clay loam, or very fine sandy loam. This soil is calcareous throughout (SCS, 1981).

Matamoros soil, typically located at the nearly level lower positions, is moderately well drained and slowly permeable. Matamoros soil has a grayish brown silty clay surface, and underlying material of light brownish gray or grayish brown silty clay (SCS, 1981). Grulla soil is located in old river channels or oxbows, while Zalla soil is normally within the inside curves of the river. Camargo soil is in positions similar to the Rio Grande soil (SCS, 1981).

Figure 3.4 presents predominant soil in the vicinity of the Hidalgo Protective Levee System. Table 3.6 quantifies types of soil within a 1,000-foot land use corridor. Nearly one half of the corridor is composed of Rio Grande silt loam and Laredo silty clay loam. Other abundant types of soil, represented in over 10 percent of the corridor, are the Reynosa silty clay loam and Camargo silty clay loam. Rio Grande silt loam is the predominant soil along the 3-mile levee segment that runs along the LRGV National Wildlife Refuge where the soil borrow easements are located. The Rio Grande silt loam is characterized as a deep, nearly level soil with slopes ranging from 0 to 1 percent, present in irregularly shaped areas ranging from 20 to 50 acres. This soil is well-drained, permeability is moderately rapid, and available water capacity is high (SCS, 1981).

Table 3.6 Predominant Soil in the Levee System Vicinity

Description	Soil Map Unit (SCS, 1981)	Acres Within 1,000 Foot Corridor	1000-foot Corridor Composition
Rio Grande silt loam	62	130.6	24.5%
Laredo silty clay loam	33	126.3	23.7%
Reynosa silty clay loam	55	74.3	13.9%
Camargo silty clay loam	6	61.2	11.5%
Grulla clay	15	31.1	5.8%
Camargo silt loam	5	24.9	4.7%
Urban Land	68	22.7	4.2%
Rio Grande silty clay loam	63	19.1	3.6%
Matamoros silty clay	34	17.5	3.3%
Reynosa-Urban land complex	57	6.6	1.2%
Zalla silt loam	74	5.9	1.1%
Arents loam	1	5.0	0.9%
Runn silty clay	64	5.0	0.9%
Zalla loamy fine sand	73	3.0	0.6%
Total Acreage		**533.4**	

3.5 COMMUNITY RESOURCES

3.5.1 Socioeconomics

The Hidalgo Protective Levee System is located in the southern portion of Hidalgo County which comprises 1,596 square miles of Rio Grande delta (Hidalgo County 2003). The nearest populated areas to the proposed levee improvement area are the Cities of Hidalgo adjacent to the levee system; Granjeno, Madero, and Mission to the northwest; McAllen and Pharr to the north; and Las Milpas to the northeast.

Population

Hidalgo County's total population in 2000 was approximately 569,463, a 33 percent increase from 383,545 in 1990 (U.S. Census Bureau 2000). The largest populated cities within the county are McAllen with a population of 106,414; Mission, population 45,000; and Pharr, population 46,660. The City of Hidalgo had a 2000 population of 7,322. The largest racial category for the county is "Hispanic or Latino" (Table 3.7). The median age for Hidalgo County is 27 years, with a 48 percent male and 52 percent female population. According to the 2000 U.S. Census, Hidalgo County has 192,658 total housing units; 81 percent of which are occupied (U.S. Census Bureau 2000).

Table 3.7 Racial Composition of Hidalgo County

Race	Number	Percent
Hispanic or Latino (any race)	503,100	88.3%
White	59,423	10.4%
Black or African American	1,934	0.3%
American Indian and Alaska Native	428	0.1%
Asian	3,635	0.6%
Other	1,371	0.3%
Total Population	***569,463***	***100%***

Employment

Hidalgo County's total full-time and part-time employment in 2001 was 217,418 (Bureau of Economic Analysis 2003). The largest employment sectors in terms of jobs were federal, state, and local government; trade, transportation and utilities; and education and health services with 43,699, 35,337, and 25,335 jobs, respectively. The unemployment rate in 2002 was 12.1 percent (Texas Economic Development 2005). Farm employment makes up approximately 2 percent of the county's total employment (Bureau of Economic Analysis 2003). In 1997 there were approximately 1,373 farms totaling 635,884 acres in the county. The surrounding area near the proposed levee improvement area is primarily agricultural.

Income

Income and poverty figures obtained from the 2000 census for Hidalgo County are provided in Table 3.8 (U.S. Census Bureau 2000). Hidalgo County records 41,725 or

31.3 percent of the families and 201,865 or 35.9 percent of individuals are below the poverty line. The average per capita annual income is $9,899.

Table 3.8 Hidalgo County Income Data

Income and Poverty Characteristics	Hidalgo County
Total population	569,463
Total number of families	133,186
Median family income	$ 26,009
Families below the poverty line (31.3%)	41,725
Individuals below the poverty line (35.9%)	201,865
Total number of households (81% occupancy)	156,709
Median household income	$ 24,863
Per capita income (dollars)	$ 9,899

3.5.2 Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, was issued by the president on February 11, 1994. The Executive Order requires a federal agency to make "…achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." As such, a proposed action must be evaluated in terms of an adverse effect that:

- Is predominantly borne by a minority population and/or low-income population; or

- Would be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority population and/or non-low income population.

Information from Tables 3.7 and 3.8 indicate that Hidalgo County has disproportionately high minority (approximately 88 percent) and low-income populations (individuals – 35.9 percent) in relation to the State of Texas.

3.5.3 Transportation

Hidalgo County is an important throughway for agricultural products. The major artery for highway traffic is U.S. Highway 281, which connects Hidalgo County with cities to the north. Also important is U.S. Highway 83 which traverses the county from east to northwest. Hidalgo County has an extensive network of state and farm-to-market

roads. The two spans of the Hidalgo-Reynosa International Bridge over the Rio Grande serve as crossing points between Mexico and the United States. Two major rail systems serve Hidalgo County.

The crown of the Hidalgo Protective Levee System is utilized by the USIBWC as a service road for levee maintenance and vegetation management. The service road is also used extensively by the Border Patrol for immigration control, and by the USFWS for access to the Pate Bend and Hidalgo Bend Tracts of the LRGV National Wildlife Refuge. In the north reach of the levee system, from levee miles 0.3 to 1.5, the levee is used to some extent as part of the farm road network.

3.6 ENVIRONMENTAL HEALTH

3.6.1 Air Quality

The Clear Air Act, 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 a federal administrator for attainment and maintenance of concentration-based standards called National Ambient Air Quality Standards (NAAQS). The USEPA classifies air quality within an AQCR according to whether the concentrations of criteria air pollutants in the atmosphere exceed primary or secondary NAAQS. All areas within each AQCR are assigned a designation of attainment, nonattainment, unclassifiable attainment, or not designated attainment for each criteria air pollutant.

An attainment designation indicates that air quality within an area is as good as or better than the NAAQS. The proposed levee improvement area is located within AQCR 213, or the Brownsville-Laredo AQCR. This AQCR is located completely within the State of Texas, covering Cameron County, Hidalgo County, Jim Hogg County, Starr County, Webb County, Willacy County, and Zapata County. As of April 2005, the USEPA designated air quality within all counties of AQCR 213 to be under attainment status for all criteria pollutants (USEPA 2005). The emissions data for Hidalgo County are used for analysis purposes because the activity associated with the alternatives would be localized in the narrow area along the river, and emissions from the activities would not likely affect the more distant counties within the AQCR.

The TCEQ has identified 12 companies in Hidalgo County as contributors of point source emissions. Potential stationary sources of criteria pollutant and hazardous air pollutant emissions within Hidalgo County include the Rio Grande Valley Sugar growers, Inc., several oil mills and refineries, and utilities and gasoline facilities (TCEQ 2004). Area emission sources for Hidalgo County, as designated generally by USEPA, include waste disposal and recycling, highway and off-highway vehicles, and other miscellaneous emission sources (USEPA 1999). The area and stationary point source emission inventory for Hidalgo County for calendar year 1999, the latest available data from USEPA as of May 2005 (USEPA 1999) is as follows:

- Carbon monoxide, 151,085 tons per year;

- Volatile organic compounds, 27,812 tons per year;
- Nitrogen dioxide, 19,726 tons per year;
- Sulfur oxides, 1,127 tons per year; and
- Particulate matter greater than 10 micrometers (PM_{10}), 61,819 tons per year.

3.6.2 Noise

Guidelines

Noise is defined as sound that is undesirable because it interferes with speech and hearing, is intense enough to damage hearing, or is otherwise annoying. Noise levels often change with time. To compare sound levels over different time periods, several descriptors have been developed that take into account this time-varying nature. These descriptors are used to assess and correlate the various effects of noise on humans.

The day-night average sound level (DNL) is a measure of the total community noise environment. DNL is the average A-weighted sound level in decibels (dB), or dBA, over a 24-hour period, with a 10 dBA adjustment added to the nighttime levels (between 10:00 p.m. and 7:00 a.m.). This adjustment is an effort to account for increased human sensitivity to nighttime noise events. DNL was endorsed by the USEPA for use by federal agencies. DNL is an accepted unit for quantifying annoyance to humans by general environmental noise, including aircraft noise. The Federal Interagency Committee on Urban Noise developed land use compatibility guidelines for noise (U.S. Department of Transportation, 1980). Potential adverse effects of noise include annoyance, speech interference, and hearing loss.

Annoyance. Noise annoyance is defined by the USEPA as any negative subjective reaction to noise by an individual or group. Typically 15 to 25 percent of persons exposed on a long-term basis to DNL of 65 to 70 dBA would be expected to be highly annoyed by noise events, and over 50 percent at DNL greater than 80 (National Academy of Sciences, 1977).

Speech Interference. In a noisy environment, understanding speech is diminished when speech signals are masked by intruding noises. Based on a variety of studies, DNL 75 dBA indicates there is good probability for frequent speech disruption. This level produces ratings of "barely acceptable" for intelligibility of spoken material. Increasing the level of noise to 80 dBA reduces the intelligibility to zero, even if the people speak in loud voices.

Hearing Loss. Hearing loss is measured in dBs and refers to a permanent auditory threshold shift of an individual's hearing. The USEPA (USEPA, 1974) recommended limiting daily equivalent energy value of equivalent sound level of 70 dBA to protect against hearing impairment over a period of 40 years. Hearing loss projections must be considered conservative as the calculations are based on an average daily outdoor exposure of 16 hours. It is recommended that no residential uses, such as homes, multi-family dwellings, dormitories, hotels, and mobile home parks, be located where the noise

is expected to exceed a DNL of 65 dBA. Some commercial and industrial uses are considered acceptable where the noise level exceeds DNL of 65 dBA. For outdoor activities, the USEPA recommends DNL of 55 dBA as the sound level below which there is no reason to suspect that the general population will be at risk from any of the impacts of noise (USEPA, 1974).

Baseline Noise Levels

Land-use and zoning classifications in the area surrounding the proposed levee improvement area provide an indication for potential noise impact. Land use surrounding the Hidalgo Protective Levee System is predominantly managed as wildlife refuge areas and agricultural lands. No sensitive noise receptors such as schools, churches, and medical facilities are located in or surrounding the Hidalgo Protective Levee System. The Hidalgo Historic Pumphouse currently operates as a visitor center and museum.

Typical outdoor noise sources near the levee system include vehicles, pickup trucks, diesel tractor mowers, and other farm machinery. Noise sources such as mowers at 100 feet, a diesel truck, or scrapers used to grade levee roads, at 50 feet are approximately 70 dBA, 88 dBA, and 89 dBA respectively (CERL, 1978).

3.6.3 Hazardous and Toxic Waste

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

Waste disposal activities at or near the proposed levee improvement area were reviewed to identify areas where industrial processes occurred, solid and hazardous wastes were stored, disposed, or released; and hazardous materials or petroleum or its derivatives were stored or used. A data search on waste storage and disposal sites was conducted on April 21, 2005 using the following databases:

- The National Priority List (NPL);
- RCRA Corrective Actions and associated Transport, Storage, and Disposal (TSD) list;
- State equivalent priority list;
- State equivalent Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) list;
- Sites currently or formerly under review by the USEPA;
- RCRA-permitted treatment, storage, and disposal facilities;
- RCRA registered generator of hazardous waste (GENS);

- Registered underground storage tanks (UST) including leaking USTs;
- Registered aboveground storage tanks;
- Sites permitted as solid waste landfills, incinerators, or transfer stations;
- Emergency Response Notification System of Spills (ERNS) list;
- State spills list.

The search extended along the Hidalgo Protective Levee System, up to 1 mile from the levee corridor centerline. Table 3.9 presents results of the search, including the search radius by individual database. Detailed results are presented in Section 5 of the Technical Support Studies Report prepared in conjunction with the Environmental Assessment (Parsons, 2005; an electronic CD version is attached to front cover of this document). No waste storage and disposal sites were identified for the levee corridor. Within 1/8 mile of the levee centerline, three fuel storage sites and an inactive storage facility were identified, all located within the City of Hidalgo.

Table 3.9 Summary Search Report on Waste Storage and Disposal

Database	Database Updated	Search Radius	Levee Corridor	1/8 Mile	1/4 Mile	1/2 Mile	Total
NPL	02-14-05	1.00	0	0	0	0	0
RCRA TSD	02-14-05	0.50	0	0	0	0	0
SWL	09-16-02	0.50	0	0	0	0	0
CERCLIS	01-18-05	0.50	0	0	0	0	0
State Sites	01-05-05	1.00	0	0	0	0	0
NFRAP	06-23-04	0.25	0	0	1	-	1
RCRA COR	02-14-05	1.00	0	0	0	0	0
RCRA GENS	02-14-05	0.50	0	0	0	-	0
Regular UST/AST	03-11-05	0.25	0	3	3	-	6
Leaking UST	03-16-05	0.50	0	0	4	2	6
ERNS	12-31-04	0.25	0	0	0	-	0
Other	03-22-05	0.25	0	1	0	-	1
Total Sites			**0**	**4**	**8**	**2**	**14**

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SECTION 4
ENVIRONMENTAL CONSEQUENCES OF PHASE 1 ALTERNATIVES

Section 4 presents an analysis of the environmental consequences of the No Action Alternative and Footprint Expansion Alternative for Phase 1 of the levee improvement project. Resource areas are presented in the same sequence used for the description of the affected environment in Section 3: biological resources; cultural resources; water resources; land use and soil; community resources; and environmental health issues.

No indirect or cumulative impacts associated with other projects have been identified for Phase 1 of the levee improvement project. Proposed mitigation measures for potential direct impacts of the Phase 1 Footprint Expansion Alternative are described in Section 6 following discussion of environmental consequences associated with Phase 2 of the proposed improvements to the Hidalgo Protective Levee System.

4.1 BIOLOGICAL RESOURCES

4.1.1 Vegetation

Phase 1 No Action Alternative. No impacts are anticipated as the current levee configuration would be retained.

Phase 1 Footprint Expansion Alternative. Improvements to the Hidalgo Protective Levee System would impact plant communities through excavation and fill activities. Impacts would occur within potential borrow easements and within the expanded levee footprint area. Potential impacts are shown in Table 4.1.

Existing grassland along the levee and adjacent areas would be temporarily removed for a 9.9-acre expansion corridor to be replaced by a managed grass cover for erosion control. The footprint expansion would not affect wetlands or agricultural communities.

Localized impacts on vegetation would occur in an excavation area of up to 37 acres, covering most of borrow easement #1. Vegetation in this easement, located within the Pate Bend Tract of the LRGV National Wildlife Refuge, is composed of approximately 90 percent thorn woodland in varying stages of ecological succession. Woodland management by the USFWS promotes increased density to enhance woodland value as wildlife habitat. The removal of thorn woodland from borrow easement #1 would be considered a significant impact as it represents 31 percent of the estimated 106 acres of that plant community currently present in the Pate Bend Tract of the refuge. Relocation of borrow easements, a proposed mitigation action, is described in Section 6.

Impacts to approximately 4 acres of grasslands within the easements would be short-term, and considered beneficial if re-vegetated with woody plants. Unlike thorn

woodlands community, bufflegrass, is a common plant community dominated by invasive species and can be rapidly re-established.

Table 4.1 Phase 1 Impacts to Vegetation within Levee Corridor and Borrow Easements

Plant Community	Acreage	Impact Characterization
Footprint Expansion (Mile 0.0 to 3.3)		
Wetlands	0	Wetlands A are located outside the levee footprint expansion area. No wetlands would be impacted.
Grassland	9.9	Short-term impact on grassland communities within USIBWC right-of-way. An invasive species, bufflegrass, is predominant. Herbaceous vegetation can be rapidly re-established.
Soil Borrow Easements		
Thorn Woodland	33	Permanent removal from borrow easement #1 area within LRGV National Wildlife Refuge where woodlands in varying stages of succession comprise approximately 90 percent. Management activities by USFWS target these communities for shrub density enhancement. The impact would be significant because the removal represents 31 percent of the thorn woodland currently present in the Pate Bend Tract of the refuge.
Grassland	4	Short-term impact on grassland communities. An invasive species, bufflegrass, is predominant. Herbaceous vegetation can be rapidly re-established. Removal (and subsequent woody revegetation) of these areas would be considered as an opportunity to promote a more desirable vegetation community.

4.1.2 Wildlife

Phase 1 No Action Alternative. No impacts are anticipated as the current levee configuration would be retained.

Phase 1 Footprint Expansion Alternative. Construction and removal of vegetation within borrow areas would have a localized negative impact on some species of wildlife. Individuals would be displaced to adjacent habitat of similar composition. Negative impacts to wildlife, particularly migratory birds, would be minimized by conducting excavation and fill operations outside the nesting season and major migratory periods.

Removal of the low value bufflegrass community represents a short-term negative impact as herbaceous vegetation can be re-established rapidly. Bufflegrass dominated grasslands are difficult to convert to woody communities through typical management practices (*e.g.*, herbicide, plantings *etc*.), therefore, removal (and subsequent woody revegetation) of these areas would be considered as an opportunity to promote a more desirable vegetation community.

Potential removal of higher value thorn woodland, however, would require a recovery period of over 25 years to achieve a community structure similar to current conditions. Although not considered unique, the limited extent of thorn woodland accentuates its value as wildlife habitat.

4.1.3 Threatened, Endangered and Sensitive Species

Phase 1 No Action Alternative. No impacts are anticipated as current levee configuration would be retained.

Phase 1 Footprint Expansion Alternative. Threatened and endangered species are not likely to be affected by levee construction activities. Potential impacts to those species are described in Table 4.2. Out of 24 species considered to be potentially present within the vicinity of the levee corridor and borrow easements, only potential corridor habitat for the ocelot would be removed. Potential impacts are as follows.

- Levee expansion activities on the river side corridor would have negligible adverse impacts to T&E habitat. Plant communities include grasslands dominated by bufflegrass, old field communities, agricultural areas, and some woodlands; and are punctuated by commercial, industrial, and residential areas within the limits of the City of Hidalgo.
- Levee expansion adjacent to the LRGV National Wildlife Refuge could remove low quality ocelot habitat (the quality of that habitat is considerably low for ocelot in bufflegrass-dominant areas). Any utilization of habitat by this species on the river side of the levee would be strictly limited to transit corridors due to the ocelot's need for a greater shrub density.
- Potential T&E habitat within thorn woodland borrow easements could be impacted by excavation activities. However, the quality of that habitat is relatively low for ocelots. Any utilization of habitat by the species would likely be limited to transit corridors due to the ocelot's need for a greater shrub density.

4.1.4 Jurisdictional Wetlands and Aquatic Habitat

Phase 1 No Action Alternative. No impacts are anticipated as current levee configuration would be retained.

Phase 1 Footprint Expansion Alternative. Improvements to the Hidalgo Protective Levee System are not anticipated to impact wetlands. Although a 0.52-acre emergent marsh (Wetlands A) is found adjacent to the levee and within USIBWC property, the width of the available ROW will allow levee footprint expansion away from the wetlands area.

Table 4.2 Potential Impact of Phase 1 Construction to Federal and State-Listed Threatened and Endangered Species

	Common Name	Association with Project Area Habitat	Potential Effect
PLANT SPECIES	Texas ayenia	Terraces and floodplain areas within borrow sites that have thick canopy cover.	Not-likely to affect
AMPHIBIAN SPECIES	Black spotted newt	Riparian and other moist soil areas along flood-side of levee.	Not-likely to affect
	South Texas siren	Riparian and other moist soil areas along flood-side of levee.	Not-likely to affect
REPTILE SPECIES	American alligator	Irrigation ditch and wetlands areas north of levee area.	Not-likely to affect
	Black-stripped snake	Sandy soil areas of borrow sites.	Not-likely to affect – Timing of construction activities to avoid nesting season (April – June)
	Indigo snake	Mesquite woodlands and mesquite-acacia woodlands of borrow sites and along flood-side of levee.	Not-likely to affect
	Northern cat-eyed snake	Thorn brush woodlands, dense thickets bordering ponds and streams, semi arboreal, nocturnal.	Not likely to affect
	Reticulate collard lizard	Open brush grasslands; thorn-scrub vegetation, usually on well drained gravelly or sandy soil.	Not likely to affect
	Texas horned lizard	Open arid or semi-arid regions with sparse vegetation, grass, cactus, scattered brush or scrubby trees.	Not likely to affect
	Texas tortoise	Open scrub woods, arid brush, lomas, grass cactus association, open brush with grass understory preferred.	Not likely to affect
BIRD SPECIES	Texas Botteri's sparrow	Parkland areas within borrow sites and along flood-side of levee.	Not-likely to affect – Timing of construction activities to limit impacts
	Northern beardless-tyrannulet	Mesquite woodlands and mesquite-acacia woodlands of borrow sites and along flood-side of levee.	Not-likely to affect – Timing of construction activities to avoid breeding season (April – July)
	American peregrine falcon	Potential migrant.	Not-likely to affect – Timing of construction activities to limit impacts
	Arctic peregrine falcon	Potential migrant.	Not-likely to affect – Timing of construction activities to limit impacts
	Cactus ferruginous pygmy-owl	Riparian corridors and mesquite thickets; roosts in small caves and recesses on slopes of low hills.	Not-likely to affect
	Gray hawk	Mature woodlands of river valleys and adjacent semiarid mesquite and scrub grasslands.	Not-likely to affect
	Hook-billed kite	Dense tropical and subtropical forests, but does occur in open woodlands, uncommon to rare in most of its range,	Not-likely to affect

	Common Name	Association with Project Area Habitat	Potential Effect
	Interior least tern	Nests along sand and gravel bars with braided streams, rivers, inland channels, and some lakes.	Not-likely to affect – Timing of construction activities to avoid breeding season (April – June)
	Rose-throated becard.	Riparian corridors and mesquite thickets, open forest, and mangroves; breeds April – July.	Not-likely to affect
	Tropical parula	Dense woodlands or parklands, riparian corridors, shrublands with dense underbrush. Breeds April – July.	Not-likely to affect
MAMMAL SPECIES	Ocelot	Woodland communities along flood-side of levee and within woodland communities in borrow sites.	Not-likely to affect
	Gulf Coast jaguarondi	Woodland communities along flood-side of levee and within woodland communities in borrow sites..	Not-likely to affect
	Southern yellow bat	Potential for incidental use as foraging areas.	Not-likely to affect
	Coues' rice rat	Willow-phragmites riparian areas along intake canal connecting the Hidalgo Pumphouse with the Rio Grande.	Not-likely to affect – Timing of construction activities to avoid breeding season (April – June)

4.2 CULTURAL RESOURCES

4.2.1 Archaeological Resources

Phase 1 No Action Alternative. No impacts are anticipated as the current levee configuration would be retained.

Phase 1 Footprint Expansion Alternative. Improvements to the levee system have a low potential to impact archaeological resources. Previous investigations by Cooper, *et al*. found that ground disturbance extending no more than 6 feet in depth "…would not likely impact significant archeological deposits…." (Cooper, *et al.* 2002). Ground disturbing activities related to the proposed levee improvements of the Phase 1 Footprint Expansion Alternative are not expected to extend to 6 feet.

One area where archaeological materials may remain in the upper 6 feet of soil is near the McAllen Pump House. Cooper, *et al.* (2002) identified a high probability area for historic-era archaeological sites at this location. The 1916 United States Geological Survey topographic map indicates structures were standing in this vicinity at that time. No standing structures now exist at the location, but historic-era archaeological materials may remain. There is a low likelihood that any of these remains would be significant.

No areas were identified by Cooper *et al.* (2002) that were considered to be high probability for the occurrence of prehistoric archaeological sites although they do state that areas of historic occupation sometimes contain a prehistoric component.

Prehistorically utilized landforms were also considered desirable living surfaces by European settlers (Cooper et al. 2002:94). Therefore, the historic HPA designated above should also be considered as possible locations for prehistoric archaeological sites.

Excavation of soil from the two designated borrow areas may involve deeper disturbance than levee construction, increasing the possibility of impacting archaeological remains. A cultural resources survey would be completed for all areas of new construction and borrow sites in accordance with a Memorandum of Agreement between the THC and USIBWC regarding this action.

4.2.2 Historical and Architectural Resources

Phase 1 No Action Alternative. No impacts are anticipated as the current levee configuration would be retained.

Phase 1 Footprint Expansion Alternative. Improvements to the Hidalgo Protective Levee System would not physically impact any historical or architectural resources because no historic-age resources are located within the areas where levee modifications or borrow activities would take place. The Phase 1 Footprint Expansion Alternative has a low potential to impact historic or architectural resources if any such resource is close enough to the proposed levee improvement area that its integrity of setting or feeling could be visually affected. Preliminary investigations indicate no historic-age resources exist close enough to the levee improvement area to suffer from such visual impacts.

4.3 WATER RESOURCES

4.3.1 Flood Control

Phase 1 No Action Alternative. The No Action Alternative would retain the current configuration of the Hidalgo Protective Levee System, as designed over 30 years ago, and current level of protection currently associated with this system. Under severe storm events, current containment capacity may be insufficient to fully control Rio Grande flooding with risks to personal safety and property.

Phase 1 Footprint Expansion Alternative. Improvements to the levee system would increase flood containment capacity to control the design flood event.

A potential concern associated with increasing the height of the Hidalgo Protective Levee System is the potential impact to the performance of the levee system in this reach of the LRGFCP. To address this concern, the hydraulic model used in predicting levee deficiencies along the LRGFCP was partially modified to reflect levee elevation following implementation of improvements to the Hidalgo Protective Levee System. The modified hydraulic model was then evaluated for two indicators of potential adverse impacts: increased water elevation for the design storm, and anticipated water edge velocity along the base of the levee. Figure 4.1 illustrates the location of cross sectional areas of the hydraulic model along the Hidalgo-Reynosa reach of the LRGFCP.

Figure 4.1 Cross-sectional Areas along the LRGFCP Hidalgo-Reynosa Reach

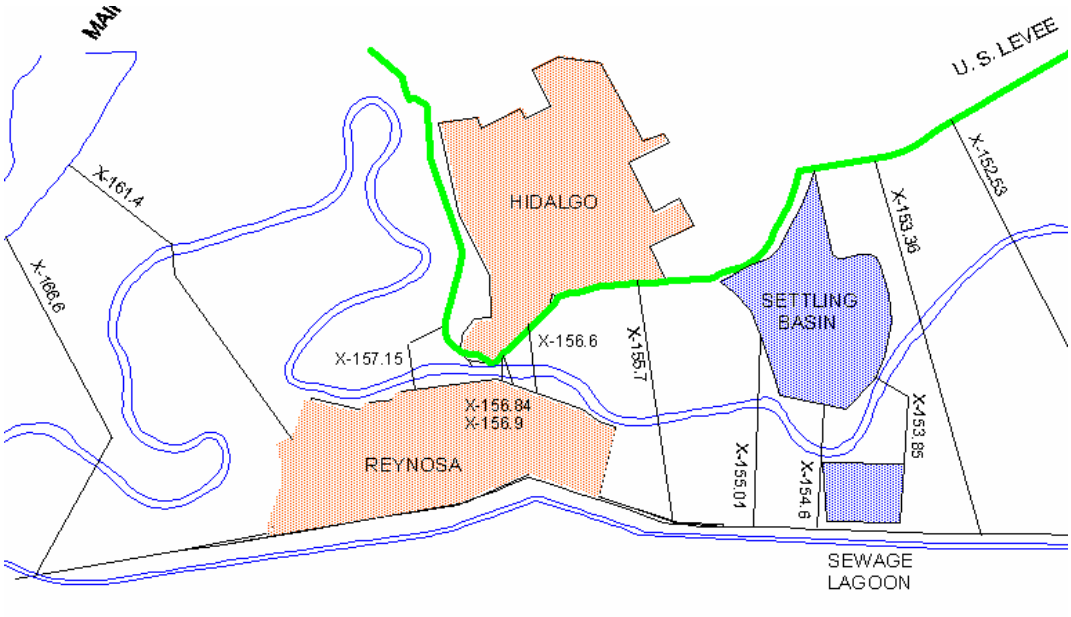


Table 4.3 presents a comparison of water elevations under current conditions and following increase in levee height to obtain a 3-foot freeboard elevation above the anticipated water level. Results of the HEC-RAS hydraulic model developed for flood simulation along the LRGFCP indicate that water level through the Hidalgo-Reynosa reach would increase by less than 1 inch. This value is not significant as current levee deficiencies typically range from 3 to 8 feet along this reach of the LRGFCP.

Table 4.3 Potential Change in Water Elevation After Levee Improvements

LRGFCP Cross Section ID	Levee Elevation (ft)			Water Surface Elevation (ft)		
	Hidalgo System		Existing	Existing Hidalgo Levee	Raised Hidalgo Levee	Water Elevation Difference
	Existing Levee	Raised Levee	Reynosa Levee			
161.4	117.3	117.3	119.6	117.50	117.51	0.01
157.15	111.0	116.5	111.6	113.50	113.53	0.03
156.93	108.5	115.9	108.5	112.90	112.93	0.03
156.9	108.5	115.4	108.5	112.41	112.41	0.00
156.87	108.5	115.5	108.5	112.45	112.46	0.01
156.84	108.5	115.4	108.5	112.35	112.35	0.00
156.6	108.5	115.9	110.4	112.26	112.25	-0.01
155.7	112.6	114.9	110.3	111.88	111.88	0.00

Minimum changes, less than 10 percent, were also predicted in water edge velocity along the base of the levee, either in Hidalgo or Reynosa, as a result of the levee height increase (Table 4.4). This parameter is an indicator of erosion potential at the base of the levee structure.

Table 4.4 Potential Change in Water Edge Velocity After Levee Improvements

LRGFCP Cross Section ID	Levee Elevation (ft)			Water Edge Velocity (ft/s)			
	Hidalgo System		Existing Reynosa Levee	Hidalgo Levee Toe		Reynosa Levee Toe	
	Existing Levee	Raised Levee		Existing Levee	After Hidalgo Levee Increase	Existing Levee	After Hidalgo Levee Increase
161.4	117.3	117.3	119.6	0.78	0.78	0.37	0.37
157.15	111.0	116.5	111.6	1.08	1.09	1.65	1.65
156.93	108.5	115.9	108.5	1.41	1.44	0.74	0.74
156.9	108.5	115.4	108.5	2.23	2.25	1.69	1.69
156.87	108.5	115.5	108.5	1.63	1.75	1.40	1.39
156.84	108.5	115.4	108.5	0.71	0.77	2.14	2.13
156.6	108.5	115.9	110.4	1.07	1.23	2.17	2.20
155.7	112.6	114.9	110.3	1.13	1.13	0.90	0.90

4.3.2 Water Flow

Phase 1 No Action Alternative. No impacts are anticipated as the current levee configuration would be retained.

Phase 1 Footprint Expansion Alternative. Improvements to the Hidalgo Protective Levee System would not affect water bodies.

4.4 LAND USE AND SOIL

4.4.1 Land Use

Phase 1 No Action Alternative. No impacts to land use are anticipated as the current levee configuration would be retained.

Phase 1 Footprint Expansion Alternative. Table 4.5 summarizes potential changes in land use as a result of Phase 1 improvements to the Hidalgo Protective Levee System for three potential alignments: centered, land side offset, and river side offset.

The centered alignment of Phase 1 would occupy 36.6 acres, fully within the USIBWC ROW with the exception of 0.1 acre in agricultural land. Some extension of the footprint beyond the ROW would occur under the offset alignments (Table 4.5). For the offset landside alignment, the 36.7-acre footprint would include 0.6 acre of agricultural lands, and 0.1 acre of commercial industrial. These values increase for the offset river side alignment that would include 1.1 acres of agricultural lands, 0.3 acre of commercial industrial, and 0.1 acre of municipal-county lands.

Table 4.5 Potential Change in Land Use along the Hidalgo Protective Levee System from Phase 1 Alternatives

Landuse	1000-foot Landuse Buffer (acres)	Phase 1 No Action Alternative (acres)	Phase 1 Levee Footprint Expansion Alternative (acres)		
			Centered Alignment	Riverside Alignment	Landside Alignment
Agriculture	140.8	0.0	0.1	1.1	0.6
Commercial - Industrial	70.6	0.0	0.0	0.3	0.1
Municipal - County	3.1	0.0	0.0	0.1	0.0
Residential	0.0	0.0	0.0	0.0	0.0
Wildlife refuge – USFWS	50.2	0.0	0.0	0.0	0.0
Levee ROW - USIBWC	124.7	25.6	36.5	38.3	36.0
Major Transportation	11.6	0.0	0.0	0.0	0.0
Total	**400.9**	**25.6**	**36.6**	**39.7**	**36.7**

4.4.2 Soil

Phase 1 No Action Alternative. No impacts to soil would be anticipated as the current levee configuration would be retained.

Phase 1 Footprint Expansion Alternative. Improvements to the Hidalgo Protective Levee System would require use of soil borrow easements to increase levee height. The estimated extent of the excavation would be 37 acres assuming an average depth of 6 feet, and could be fully conducted within the existing USIBWC borrow easement #1 whose surface area is approximately 45 acres. While easement size is not a limitation for levee construction, its location within the LRGV National Wildlife Refuge restricts its potential use. Vegetation in existing easements, primarily thorn woodland, provides a relatively high quality habitat within the Pate Bend Tract of the refuge. Soil types similar to those present in the easements (Rio Grande silt loam, Rio Grande silty clay loam, and Zalla silt loam) are present within the tract at locations with low quality grassland habitat. Use of alternate sites is under joint consideration by the USFWS and the USIBWC. A conceptual mitigation plan for soil borrow easements is described in Section 6.

4.5 COMMUNITY RESOURCES

4.5.1 Socioeconomics

Phase 1 No Action Alternative. No impacts to community resources are anticipated as the current levee configuration would be retained.

Phase 1 Footprint Expansion Alternative. The analysis of impacts of the Phase 1 Footprint Expansion Alternative on socioeconomic resources and environmental justice was based on changes in employment, income, and business volume as indicator criteria, as well as the disproportionate number of minority or low-income populations potentially affected by the proposed levee improvement project.

On the basis of an estimated cost of $1,195,030 per mile of construction, cost of the Phase 1 Footprint Expansion Alternative over a 3.3-mile reach of the existing levee would be $3,943,599. This amount represents the direct annual influx of federal funds into Hidalgo County since Phase 1 construction could be completed within a 1-year period. This influx would have a positive local economic impact, but would be limited to the construction period. Table 4.6 illustrates the magnitude of the economic influx relative to reference values for Hidalgo County.

Table 4.6 Economic Impacts of Phase 1 Footprint Expansion Alternative

Evaluation Criteria	Unit Value for Rio Grande Levees [a]	Phase 1 Footprint Expansion Alternative	Annual Value for Hidalgo County	Change Relative to Hidalgo County
Local Expenditures	$ 1,000,000	$ 3,943,599	Not applicable	
Direct Employment	19	75		
Indirect Employment	12	48		
Total Employment	31	123	180,121 [b]	0.07%
Direct Sales Volume	$ 1,274,065	$ 5,026,800		
Indirect Sales Volume	$ 2,114,948	$ 8,344,488		
Total Sales Volume	$ 3,389,013	$ 13,371,288	$ 10,375 million [c]	0.13%
Direct Income	$ 554,814	$ 2,189,009		
Indirect Income	$ 452,466	$ 1,785,197		
Total Income	$ 1,007,280	$3,974,206	$5,637 million [d]	0.07%

[a] *Unit data for levee construction from the USIBWC Rio Grande Canalization Project (Parsons 2004).*
[b] *Total of the labor force (16 years and older) employed in 2000 (U.S. Census Bureau, 2000).*
[c] *Gross sales for Hidalgo County in 2004 (Texas Comptroller 2005).*
[d] *Based on a 2000 per capita income of $9,899 and an Hidalgo County population of 569,463.*

Other economic indicators were also calculated on the basis of unit values from a similar levee expansion project in an upper reach of the Rio Grande (*Final EIS – River Management Alternatives for the Rio Grande Canalization Project*, Parsons 2004). Those indicators, listed in Table 4.6, include changes in direct and indirect employment (123 temporary jobs created), changes in direct and indirect sales volume ($13,371,288) and changes in direct and indirect income ($3,974,206). In all cases, positive economic input from the proposed levee improvement project into the local economy represents only a minor fraction of the annual values at the county level (less than 0.2 percent).

4.5.2 Environmental Justice

Phase 1 No Action Alternative. Under the No Action Alternative, improvements to the Hidalgo Protective Levee System would not occur; therefore, the current condition of minority and low-income populations would remain unchanged.

Phase 1 Footprint Expansion Alternative. Data indicate that Hidalgo County has disproportionately high minority (approximately 88 percent) and low-income populations (individuals – 35.9 percent); however, construction activities would not occur in residential or workplace areas associated with these populations. A small but positive economic input to the local community would be anticipated as a result of the levee

improvement project. As a result, adverse impacts to disproportionately high minority and low-income populations from construction activities associated with the Phase 1 Footprint Expansion Alternative would not occur.

4.5.3 Transportation

Phase 1 No Action Alternative. No impacts are anticipated as the current configuration of the levee system would be retained.

Phase 1 Footprint Expansion Alternative. Improvements to the Hidalgo Protective Levee System would have moderate impacts on local transportation. During levee construction, a temporary increase in the use of access roads would take place for placement of equipment in staging areas. Most of the subsequent construction activities, however, would not require public road use as material borrow sites would be located in the vicinity of the construction sites, within the Pate Bend Tract of the LRGV National Wildlife Refuge. Following completion of the levee improvement project, the levee road would continue providing service for USFWS and Border Patrol activities.

4.6 ENVIRONMENTAL HEALTH

4.6.1 Air Quality

Phase 1 No Action Alternative. No impacts are anticipated as current levee configuration would be retained.

Phase 1 Footprint Expansion Alternative. Improvements to the Hidalgo Protective Levee System would impact air quality through excavation and fill activities. Potential impacts would be a slight increase in criteria air pollutants within Hidalgo County. (Table 4.7).

Table 4.7 Air Emissions for Phase 1 Footprint Expansion Alternative

	Emissions (tons per year)				
Parameter	**Sulfur Oxides**	**Nitrogen Dioxides**	**Carbon Monoxide**	**Volatile Organic Compounds**	**Particulate Matter (PM_{10})**
Unit emissions per mile of levee height increase*	0.55	5.05	2.11	0.40	5.61
Unit emissions per acre of excavation*	0.08	0.75	0.32	0.06	1.49
Phase 1 Footprint Expansion Alternative emissions (3.3 miles of levee expansion and 37 acres of borrow site excavation)	4.74	44.1	18.7	3.52	73.1
Hidalgo County emissions inventory**	1,127	19,726	151,085	27,812	61,819
Alternative Emissions as a Percent of Hidalgo County Emissions	0.42%	0.22%	0.012%	0.013%	0.12%

** Unit data for levee construction from the USIBWC Rio Grande Canalization Project EIS (Parsons, 2003: Table 4.11-1).*
*** USEPA, 1999, the most recent available data as of May 2005.*

Table 4.7 summarizes the additional estimated criteria pollutants associated with this alternative, as well as the percent increase above the existing Hidalgo County emissions inventory. Estimates were calculated for 3.3 miles of levee construction and 37 acres of soil excavated from borrow sites for the levee height increase. Unit air emissions estimates for these activities followed common construction practices and methods (Means 2002) and emission factors reported by USEPA (1996) as applied to a similar levee expansion project in an upper reach of the Rio Grande (*Draft Environmental Impact Statement – River Management Alternatives for the Rio Grande Canalization Project*, Parsons, 2003). Estimated emissions for all five criteria pollutants represent less than 1 percent of the Hidalgo County annual emissions inventory.

4.6.2 Noise

Phase 1 No Action Alternative. No impacts from noise are anticipated, as the current levee configuration would be retained.

Phase 1 Footprint Expansion Alternative. Improvements to the Hidalgo Protective Levee System would increase ambient noise levels through excavation of borrow sites and fill activities associated with the levee improvement project. For the purposes of this environmental assessment, it is estimated that the shortest distance between an equipment noise source and a receptor in a rural area would be a person(s) 100 feet off-site. Given the rural nature of the area, it is also 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 dBA.

It is anticipated construction activities would occur between 7:30 a.m. and 5:00 p.m., 5 days per week for the duration of the project. However, individuals would not be exposed during entire noise-producing period. Under these conditions, persons would not be exposed to long-term and regular noise above 75 BA. As stated in Subsection 3.6.2, DNL 75 dBA during the noise event indicates good probability for frequent speech disruption, producing ratings of "barely acceptable" for intelligibility of spoken material. Therefore, nearby persons should not experience loss of hearing, but may experience frequent speech disruption.

4.6.3 Hazardous and Toxic Waste

Phase 1 No Action Alternative. No impacts are anticipated as the current levee configuration would be retained.

Phase 1 Footprint Expansion Alternative. Improvements to the Hidalgo Protective Levee System would not be affected by waste storage and disposal sites. Three fuel storage sites and an inactive storage facility were identified within 1/8th of a mile of the proposed levee improvement project, all located within the City of Hidalgo (Table 3.8). None of these sites would affect, or be affected by, the proposed levee improvement project.

SECTION 5
ENVIRONMENTAL CONSEQUENCES OF PHASE 2 ALTERNATIVES

Section 5 presents an analysis of the environmental consequences of four Phase 2 Alternatives for levee improvement: No Action, Levee Footprint Expansion, No-Footprint Expansion, and Partial Levee Rerouting. Resource areas are presented in the same sequence used for the description of the affected environment in Section 3 (biological resources; cultural resources; water resources; land use and soil; community resources; and environmental health). An additional subsection is provided on potential indirect and cumulative impacts associated with other projects. Proposed mitigation measures for potential adverse impacts are discussed in Section 6.

5.1 BIOLOGICAL RESOURCES

5.1.1 Vegetation

Phase 2 No Action Alternative

No impacts would occur because the current configuration of the Hidalgo Protective Levee System between levee miles 3.3 to 4.5 would be retained.

Phase 2 Footprint Expansion Alternative

Improvements to the existing levee system would impact plant communities primarily through excavation and fill activities along the levee expansion area and within soil borrow easements. Table 5.1 summarizes potential impacts of the Phase 2 Footprint Expansion Alternative on vegetation.

Footprint Expansion Between Levee Miles 3.5 to 4.5. Existing grassland along the levee and adjacent areas would be temporarily removed for the 11.7-acre expansion corridor. Removed vegetation would be replaced by new managed grass cover required for erosion control. The levee footprint expansion would not affect wetlands or agricultural communities.

Soil Borrow Easements. Phase 2 Footprint Expansion Alternative would have localized impacts in an excavation area of up to 6 acres, approximately half the size of borrow easement #2. Vegetation in this borrow easement, located within the Pate Bend Tract of the LRGV National Wildlife Refuge, is composed of approximately 50 percent grassland and 50 percent thorn woodland in varying stages of succession. While thorn woodland removal during Phase 2 would be limited, it would increase removal to 36 acres when combined with prior excavation activities in borrow easement #1 during Phase 1 (Table 5.1). The combined loss of thorn woodland would be a potential adverse significant impact, as it represents nearly 34 percent of the Pate Bend Tract occupied by that plant community. Management of this plant community by USFWS targets wildlife habitat enhancement by increasing shrub density. Relocation of borrow easements, a proposed mitigation action, is described in Section 6.

Table 5.1 Potential Impacts of Phase 2 Footprint Expansion Alternative to Vegetation along the Levee Corridor and Within Borrow Easements

Plant Community	Phase 2 Removal (acres)	Phases 1 and 2 Combined (acres)	Impact Characterization
Footprint Expansion (Levee mile 3.5 to 4.5)			
Wetlands and Riparian	0	0	Wetlands B, located along the intake channel margin, is outside the levee footprint expansion area. No wetlands would be impacted.
Grassland	11.7	21.6	Short-term impacts to grassland communities within USIBWC and City of Hidalgo ROW. An invasive species, bufflegrass, is predominant. Herbaceous vegetation can be rapidly re-established.
Soil Borrow Easements			
Thorn Woodland	3	36	Permanent removal from borrow easement #2 area within LRGV National Wildlife Refuge where woodlands in varying stages of succession comprise approximately 50 percent of the vegetation. The combined impact of Phases 1 and 2 would be potentially significant because the removal represents 34 percent of the thorn woodland with in the Pate Bend Tract of the refuge.
Grassland	3	7	Short-term impacts as herbaceous vegetation can be rapidly re-established; an invasive species, bufflegrass, is predominant.

Floodwalls. The floodwall around the Hidalgo Historic Pumphouse would require multiple footings reaching the edge of the intake channel. Removal of small patches of woody vegetation would be required for access and operation of construction equipment. Floodwall construction along the Hidalgo-Reynosa International Bridge would have no adverse impacts to vegetation as the structure would be placed along the retaining wall surrounding the border station.

No-Footprint Expansion Alternative

Minimum impacts on vegetation are expected as a result of the Phase 2 No-Footprint Expansion Alternative. Levee height would occur along the existing levee crown, and the required soil, less than 10 percent of that required for the Phase 2 Levee Footprint Expansion Alternative, would be fully obtained from grassland areas within borrow easements. Any removed grassland vegetation along levee slopes would restored for erosion control. Concrete and other materials for levee floodwalls and mechanically reinforced levee structure would be obtained from commercial sources.

Partial Levee Rerouting Alternative (Phase 2 Proposed Action)

Table 5.2 summarizes potential impacts to vegetation as a result of levee system modifications under the Partial Levee Rerouting Alternative. This alternative has a potential for relatively greater impacts to vegetation than the Phase 2 Footprint Expansion Alternative previously discussed. These impacts are addressed in a mitigation plan discussed on a conceptual level in Section 6. The likely path of the rerouted levee segment and two potential crossing locations was previously described in Subsection 2.2.4 (Figure 2.7).

Table 5.2 Potential Impacts to Vegetation of Partial Levee Rerouting Alternative

Plant Community	Phase 2 Removal (acres)	Phases 1 and 2 Combined (acres)	Impact Characterization
New Levee along South Margin of Intake Channel			
Grassland	5	5	Short-term impacts to grassland communities within USIBWC and City of Hidalgo ROWs. An invasive species, bufflegrass, is predominant. Herbaceous vegetation can be rapidly re-established. Removal (and subsequent woody revegetation) of bufflegrass-dominated grasslands would be considered as an opportunity to promote a more desirable vegetation community.
Thorn Woodland	2	2	Permanent removal within the levee improvement area; woodlands are located within USIBWC and City of Hidalgo ROWs.
Channel Crossing			
Wetlands and Riparian	0.7	0.7	Less than 1 acre of emergent wetlands removal from the intake channel (see Subsection 5.1.3, below).
Thorn Woodland	1.9	1.9	Permanent removal within the levee crossing area along the steep intake channel margins. These thorn woodlands are located within USIBWC and City of Hidalgo ROWs.
Footprint Expansion (Levee mile 4.1 to 4.5)			
Grassland	4.6	14.5	Short-term impact to grassland communities within federal lands (USIBWC and USFWS). An invasive species, bufflegrass is predominant. Herbaceous vegetation can be rapidly re-established.
Soil Borrow Easements			
Thorn Woodland	11.8	44.8	Permanent thorn woodland removal from borrow easements #1 and #2 (6.9 and 4.9 acres, respectively) within LRGV National Wildlife Refuge where woodlands in varying stages of succession are predominant. The combined impact of Phases 1 and 2 would be a potentially significant impact because the removal represents 42 percent of the thorn woodland currently present in the Pate Bend Tract of the refuge.
Grassland	4.9	9.9	Short-term impact to grassland communities. An invasive species, bufflegrass is predominant. Herbaceous vegetation can be rapidly re-established.

New Levee Segment along Intake Channel. Existing vegetation along the south margin of the intake channel within City of Hidalgo and USIBWC ROWs, would be removed for new levee construction. The required footprint would be 5.4 acres for the levee segment leading to Crossing A, and 3.8 acres for the segment leading to Crossing B. Existing plant communities are predominantly grasslands (nearly 90 percent coverage) having bufflegrass as a primary component. Approximately 0.5 acre of thorn woodland would be removed near the junction point with the existing levee (south of the Hidalgo Historic Pumphouse). Vegetation removed from the levee corridor would be

replaced for erosion control by a managed grass cover along the structure. The levee footprint expansion would not affect wetlands or agricultural communities.

Channel Crossing. Less than 1 acre of wetlands would be removed for the channel crossing (0.7 acre for Crossing A, and 0.5 acre for Crossing B). Approximately 2 acres of thorn woodlands would be removed from the channel slope.

Footprint Expansion along Levee Miles 4.1 to 4.4. Existing grassland along the levee and adjacent areas would be temporarily removed for the 4.6-acre expansion corridor to be replaced by a managed grass cover required for erosion control. The levee footprint expansion would not affect wetlands or agricultural communities.

Soil Borrow Easements. The Partial Levee Rerouting Alternative would have localized impacts to vegetation in an excavation area of up to 16.7 acres, covering the full extent of borrow easement #2 and 6.9 additional acres from easement #1, both located within the Pate Bend Tract of the LRGV National Wildlife Refuge. Thorn woodland represents over 90 percent of easement #1 vegetation, and nearly 50 percent of easement #2, for an overall potential removal of 11.8 acres. While thorn woodland removal during Phase 2 would be limited to about 11 percent of the Pate Bend Tract, the extent of removal would increase to 44.8 acres when combined with prior excavation activities in borrow easement #1 during Phase 1 (Table 5.2). The combined loss of thorn woodland would be a significant impact, because it represents nearly 42 percent of the Pate Bend Tract occupied by that plant community. Management of this plant community by USFWS targets wildlife habitat enhancement by increasing shrub density. Relocation of borrow easements, a proposed mitigation action, is described in Section 6.

Floodwall. No impacts to vegetation are expected because the new floodwall along the Hidalgo-Reynosa International Bridge would be placed along the existing retaining wall surrounding the border station. Concrete and other materials for levee floodwalls would be obtained from commercial sources.

5.1.2 Threatened, Endangered and Sensitive Species

Phase 2 No Action Alternative

No impacts would occur as the current configuration of the Hidalgo Protective Levee System between levee miles 3.3 to 4.5 would be retained.

Phase 2 Footprint Expansion Alternative

As previously discussed in Subsection 4.1.2 for the Phase 1 Footprint Expansion Alternative, T&E species are not likely to be affected by levee construction activities; out of 24 species considered to be potentially present within the vicinity of the levee corridor and borrow easements, only potential corridor habitat for the ocelot would be removed. Up to 3 acres of low quality cat habitat would be removed from soil borrow easement #2 within the LRGV National Wildlife Refuge. Any utilization of habitat by the ocelot on the river side of the levee would be strictly limited to transit corridors due to the species' need for greater shrub density.

No-Footprint Expansion Alternative

No impacts to T&E species are anticipated as the current levee footprint would not be expanded, and small, grassed sections of borrow easement #2 would be used for materials.

Partial Levee Rerouting Alternative (Phase 2 Proposed Action)

As previously discussed for Phase 2 Footprint Expansion Alternative, T&E species are not likely to be affected by levee construction activities; out of 24 species considered to be potentially present within the vicinity of the levee corridor and borrow easements, only potential corridor habitat for the ocelot would be removed. Up to 5 acres of low-quality cat habitat would be removed from soil borrow easements within the LRGV National Wildlife Refuge; an additional 3 acres of thorn woodland would be removed from the USIBWC and City of Hidalgo ROWs outside the wildlife refuge. Any utilization of habitat by the ocelot on the river side of the levee would be strictly limited to transit corridors due to the species' need for greater shrub density.

5.1.3 Jurisdictional Wetlands

Phase 2 No Action Alternative

No impacts are anticipated as the current levee system configuration would be retained.

Phase 2 Footprint Expansion Alternative

Expansion of the Hidalgo Protective Levee System under this alternative is not anticipated to impact wetlands. A 2.54-acre area of emergent wetlands located within the intake channel (Wetlands B) is outside the levee footprint expansion area.

No-Footprint Expansion Alternative

Expansion of the Hidalgo Protective Levee System under this alternative is not anticipated to impact wetlands.

Partial Levee Rerouting Alternative (Phase 2 Proposed Action)

Under the Phase 2 Footprint Expansion Alternative, improvements to the Hidalgo Protective Levee System would impact wetlands through dredge and fill activities necessary to complete the proposed levee improvement project. Mitigation would be required as discussed in Section 6. A removal of 0.5 acre for Crossing A, and 0.7 acre for Crossing B is anticipated from the 2.54 acres of wetlands delineated within the intake channel (Wetlands B).

5.2 CULTURAL RESOURCES

5.2.1 Archaeological Resources

Phase 2 No Action Alternative

The Phase 2 No Action Alternative would not impact archaeological resources. Current levee configuration would be retained.

Phase 2 Footprint Expansion Alternative

The proposed levee improvement project under the Phase 2 Footprint Expansion Alternative would have a low potential to impact archaeological resources. Previous investigations by Cooper, *et al*. found that ground disturbance extending no more than 6 feet in depth "…would not likely impact significant archeological deposits…." (Cooper, *et al.* 2002). Ground-disturbing activities related to the levee modifications of the Phase 2 Footprint Expansion Alternative would not be expected to extend to 6 feet.

One area where archaeological materials may remain in the upper 6 feet of soil extends from approximately levee mile 3.7 to mile 4.3. Cooper, *et al.* (2002) identified a high probability area for historic-era archaeological sites at this location. The 1916 United States Geological Survey topographic map indicates structures were standing in this vicinity at that time. Historic-era archaeological materials may remain. There is a low likelihood that any of these remains would be significant.

No areas were identified by Cooper *et al.* (2002) that were considered to be high probability for the occurrence of prehistoric archaeological sites although they do state that areas of historic occupation sometimes contain a prehistoric component (Cooper et al. 2002:94). Prehistorically utilized landforms were also considered desirable living surfaces by European settlers. Therefore, the historic HPA designated above should also be considered as possible locations prehistoric archaeological sites.

The excavation of soil from the two designated borrow areas for the Phase 2 Footprint Expansion Alternative may involve deeper disturbance than levee construction, increasing the possibility of impacting archaeological remains. Excavation in these areas, where soil disturbance will be extensive and possibly deep, has a moderate to high potential to disturb significant archaeological resources. A cultural resources survey would be completed for all areas of new construction and borrow sites in accordance with a Memorandum of Agreement between the THC and USIBWC regarding this action.

No-Footprint Expansion Alternative

The Phase 2 No Footprint Expansion Alternative would not impact archaeological resources.

Partial Levee Rerouting Alternative (Phase 2 Proposed Action)

Modifications to the levee under the proposed Phase 2 Partial Levee Rerouting Alternative would have a low potential to impact archaeological resources. Previous

investigations by Cooper, *et al.* found that ground disturbance extending no more than 6 feet in depth "…would not likely impact significant archeological deposits…." (Cooper, *et al.*, 2002). Ground disturbing activities related to the levee modifications of the Phase 2 Partial Levee Rerouting Alternative are not expected to extend to 6 feet.

One area where archaeological materials may remain in the upper 6 feet of soil is the area along the south side of the Hidalgo Historic Pumphouse intake channel. Cooper, *et al.* (2002) identified a high probability area for historic-era archaeological sites that encompasses this location. According to that source, the 1916 United States Geological Survey topographic map indicates structures were standing in this vicinity at that time. Historic-era archaeological materials may remain. However, there is some indication that the Rio Grande was much nearer to the intake channel until 1930. A major flood episode in the 1930s may have resulted in the shift of the river channel to near its present location. This flood may have scoured the land between the intake channel and the current course of the river or have left flood deposits across this area capping former land surfaces. No areas were identified by Cooper *et al.* (2002) that were considered to be high probability for the occurrence of prehistoric archaeological sites although they do state that areas of historic occupation sometimes contain a prehistoric component (Cooper *et al*., 2002). Prehistorically utilized landforms were also considered desirable living surfaces European settlers. Therefore, the historic HPA designated above should also be considered as possible locations for prehistoric archaeological sites.

The excavation of soil from the two designated borrow areas for the Phase 2 Partial Levee Rerouting Alternative may involve deeper disturbance than levee construction, increasing the possibility of impacting archaeological remains. Excavation in these areas, where soil disturbance will be extensive and possibly deep, has a moderate to high potential to disturb significant archaeological resources. A cultural resources survey would be completed for all areas of new construction and borrow sites in accordance with a Memorandum of Agreement between the THC and USIBWC regarding this action. Special emphasis should be given to the southern side of the intake channel, along the levee rerouting area.

5.2.2 Historical and Architectural Resources

Phase 2 No Action Alternative

The Phase 2 No Action Alternative will not impact historical or architectural resources. Current levee configuration would be retained.

Phase 2 Footprint Expansion Alternative

The Phase 2 Footprint Expansion Alternative has a moderate potential to physically impact the Hidalgo Historic Pumphouse intake channel, an associated feature of this NRHP resource. The proposed levee improvements along the north side of the intake channel are expected to take place very close to the intake channel, so there is the possibility that physical impacts would occur. The proposed construction of the floodwall along the southwest side of the Hidalgo Historic Pumphouse also has potential to physically impact the NRHP resource.

The Phase 2 Footprint Expansion Alternative has a high potential to visually impact the setting and feel of the Hidalgo Historic Pumphouse and associated features such as the intake channel. Both the proposed increase in the height of the levee along the north side of the intake channel and the proposed construction of the floodwall near the pumphouse building would impact the integrity of the resource by altering its setting and the feel of the resource's place in time. This action could be considered to have an adverse impact to the historical resource. A memorandum of agreement would need to be developed in coordination with the THC to mitigate this adverse impact.

The Phase 2 Footprint Expansion Alternative would not impact four other historical or architectural resources identified in Subsection 3.2.2. None of these resources are close enough to the levee corridor for its integrity of setting or feel to be visually affected.

No-Footprint Expansion Alternative

The Phase 2 No Footprint Expansion Alternative has a moderate potential to physically impact the Hidalgo Historic Pumphouse intake channel, an associated feature of this NRHP resource. The proposed levee improvement project along the north side of the intake channel is expected to take place very close to the intake channel, so there is the possibility that physical impacts would occur. The proposed construction of the floodwall along the southwest side of the Hidalgo Historic Pumphouse also has potential to physically impact the NRHP resource.

The Phase 2 No Footprint Expansion Alternative has a high potential to visually impact the setting and feel of the Hidalgo Historic Pumphouse and associated features such as the intake channel. Both the proposed increase in the height of the levee along the north side of the intake channel and the proposed construction of the floodwall near the pumphouse building would impact the integrity of the resource by altering its setting and the feel of the resource's place in time. This action may be considered to have an adverse impact to the historical resource. A memorandum of agreement would need to be developed in coordination with the THC to mitigate this adverse impact.

The Phase 2 No Footprint Expansion Alternative would have no impact on four other historical or architectural resources identified in Subsection 3.2.2 since these resources are not close enough to the levee corridor for their integrity of setting or feeling to be visually affected.

Partial Levee Rerouting Alternative (Phase 2 Proposed Action)

The Phase 2 Partial Levee Rerouting Alternative has a high potential to physically impact the Hidalgo Historic Pumphouse intake channel, an associated feature of this NRHP resource. The proposed levee improvement project that would construct a levee across the intake channel at either Crossing A or Crossing B location would impact the integrity of design, setting, and feeling of the intake channel and pumphouse. Construction of the levee across the intake channel would alter the historic function of the channel, and would partially obstruct the view along the channel from the pumphouse to the river. Crossing A is preferable to Crossing B as the former would impact the setting

of the pumphouse to a lesser extent; however, Crossing B is far enough from the pumphouse that the action would not be regarded as having an adverse impact to the pumphouse setting. Appropriate use of vegetation should be able to minimize the visual impact of the new levee alignment.

A Memorandum of Agreement would need to be developed with the THC to implement either alternative stipulated above. The Memorandum of Agreement would define the terms under which the adverse effect could be mitigated, and incorporate additional considerations to direct future construction on and around the levee as well as recommendations for mitigation agreed upon by all signatories. Example considerations were provided by the THC in June 20, 2005 correspondence to the USIBWC (included in Appendix A) in which the THC noted that any change would likely yield an adverse effect determination. Those example considerations include:

- No new construction on the crown and footprint of the levee;
- Maintenance conditions for the levee and adjacent property;
- Restitution to he pumphouse museum if existing interpretative material for the levee is compromised by new configuration;
- Archaeological survey of impact areas of all new construction, all borrow locations, and any other areas of new impacts not yet identified; and
- Avoidance or mitigation of any significant archaeological deposits discovered during surveys or testing.

The Phase 2 Partial Levee Rerouting Alternative, by eliminating the need for floodwall construction in front of the pumphouse, would retain the current setting and historic landscape of the area surrounding the building. Levee rerouting would also preserve the visual connection between the intake channel and the pumphouse building complex and museum.

The Phase 2 Partial Levee Rerouting Alternative would have no impact on four other historical or architectural resources identified in Subsection 3.2.2 since these resources are not close enough to the levee corridor for their integrity of setting or feel to be visually affected.

5.3 WATER RESOURCES

5.3.1 Flood Control

Phase 2 No Action Alternative

The No Action Alternative would retain the existing configuration of the Hidalgo Protective Levee System, as designed over 30 years ago, and level of flood protection currently associated with this system. Under severe storm events, current containment capacity may be insufficient to fully control Rio Grande flooding with risks to personal safety and property.

Phase 2 Footprint Expansion Alternative

Improvements to the Hidalgo Protective Levee System, following completion of Phases 1 and 2, would increase flood containment capacity in this reach of the LRGFCP to meet design specifications for protection of the City of Hidalgo against the design flood event.

No adverse impacts south of the Rio Grande are anticipated as a result of improving the Hidalgo Protective Levee System. The proposed raising of the Hidalgo Protective Levee System would have a minimum impact on the anticipated flood water elevation along this reach of the LRGFCP as indicated by hydraulic modeling. Results of the HEC-RAS hydraulic model developed for flood simulation along the LRGFCP indicate that water level through the Hidalgo-Reynosa reach would increase by less than 1 inch. This value is not significant as current levee deficiencies typically range from 3 to 8 feet along this reach of the LRGFCP. Modeling results for improvements to the Hidalgo Protective Levee System (Phases 1 and 2 in combination) were previously presented in Table 4.3, and discussed in Subsection 4.3.1.

No-Footprint Expansion Alternative

The No-Footprint Expansion Alternative would provide flood protection to the City of Hidalgo with a minimum increase in water elevation.

Partial Levee Rerouting Alternative (Phase 2 Proposed Action)

The Partial Levee Rerouting Alternative would provide flood protection to the City of Hidalgo with a minimum increase in water elevation.

5.3.2 Water Flow

Phase 2 No Action Alternative

No impacts are anticipated as the current levee configuration would be retained.

Phase 2 Footprint Expansion Alternative

Improvements to the Hidalgo Protective Levee System under the Phase 2 Footprint Expansion Alternative would not affect water bodies.

No-Footprint Expansion Alternative

Improvements to the Hidalgo Protective Levee System under the No-Footprint Expansion Alternative would not affect water bodies.

Partial Levee Rerouting Alternative (Phase 2 Proposed Action)

This alternative would require crossing the intake channel to the Hidalgo Historic Pumphouse to tie the new levee segment to the floodwall along the Hidalgo-Reynosa International Bridge. The levee crossing would be designed with a flow control structure to facilitate water exchange with the Rio Grande under controlled conditions. This

represents an improvement over the current condition in which water exchange between the channel and the river takes place passively through two culverts under a service road, which is limited to very high and infrequent flow levels.

Placement of the crossing structure across the intake channel would require removal of less than 1 acre of wetlands and some thorn woodland, as previously discussed in Subsection 5.1.3. Section 6 presents a conceptual plan to mitigate potential loss of wetlands. Best management practices would be used during construction to minimize vegetation removal and potential deterioration of water quality.

5.4 LAND USE AND SOIL

5.4.1 Land Use

Phase 2 No Action Alternative

No impacts to land use would be anticipated as the current levee configuration would be retained.

Phase 2 Footprint Expansion Alternative

Table 5.3 summarizes potential changes in land use as a result of the Phase 2 Footprint Expansion Alternative. Changes in land use were calculated separately for centered, land side offset, and river side offset alignments.

Table 5.3 Potential Change in Land Use along the Levee Corridor as a Result of the Phase 2 Footprint Expansion Alternative

			Phase 2 Footprint Expansion Alternative		
Landuse	**1000-foot Landuse Buffer (acres)**	**Phase 2 No Action Alternative (acres)**	**Centered Alignment (acres)**	**Riverside Alignment (acres)**	**Landside Alignment (acres)**
Agriculture	0.0	0.0	0.0	0.0	0.0
Commercial - Industrial	29.8	0.0	0.0	0.0	0.1
Municipal - County	42.4	0.0	2.3	2.9	2.5
Residential	15.2	0.0	0.0	0.2	0.1
Wildlife refuge – USFWS	33.6	0.0	0.0	0.2	0.0
Levee ROW - USIBWC	22.9	6.7	14.2	16.1	15.0
Major Transportation	0.0	0.0	0.0	0.0	0.0
Total	**143.9**	**6.7**	**16.5**	**19.2**	**17.7**

The centered alignment of Phase 2 would occupy 16.5 acres, primarily within the levee ROW, with 2.3 acres extending into lands under municipal/county jurisdiction. This value would increase up to 2.9 acres for the offset alignments. The offset alignments also have the potential to extend from 0.1 to 0.2 acre into commercial, residential, and USFWS property (Table 5.3).

No-Footprint Expansion Alternative

No impacts to land use would be anticipated as a result of this alternative because an increase in the levee footprint would not be required.

Partial Levee Rerouting Alternative (Phase 2 Proposed Action)

The partially rerouted levee segment along the south margin of the intake channel would require use of up to 4.6 acres of City of Hidalgo ROW. A grassland cover for erosion control would be established on the new levee following construction. No adverse impacts would be anticipated on future use of the land to access the TPWD nature trail system along the intake channel and the LRGV National Wildlife Refuge because the new levee path would facilitate access and provide an alternate path for the Hidalgo Hike and Bike Trail project along the undeveloped south margin of the intake channel.

The existing levee along the north margin of the intake channel would be retained in its current condition from levee miles 3.5 to 4.1 while it would be expanded east of the Hidalgo Historic Pumphouse. This expansion between levee miles 4.1 to 4.5 would take place mostly within the levee ROW under USIBWC jurisdiction; however, up to 1.1 acres of municipal-county land and/or USFWS land would be required depending on the expansion alignment.

5.4.2 Soil

Phase 2 No Action Alternative

No impacts to soil would be anticipated because the current levee configuration would be retained.

Phase 2 Footprint Expansion Alternative

Under this alternative, improvements to the Hidalgo Protective Levee System would require use of soil borrow easements to increase levee height. The estimated extent of the excavation would be 87,954 cubic yards, or about 9.2 acres at an average depth of 6 feet. Soil would be fully obtained from the USIBWC borrow easement #2, located in the Pate Bend Tract of the LRGV National Wildlife Refuge, whose surface area is approximately 10 acres. However, use of the easement would have adverse impacts to the thorn woodland, a valuable wildlife habitat which represents about 50 percent of the easement.

Soil types similar to those present in the USIBWC borrow easements (Rio Grande silt loam, Rio Grande silty clay loam, and Zalla silt loam) are present at other locations within the Pate Bend Tract which have low quality grassland habitat. Use of alternate sites within the tract is under joint consideration by the USFWS and the USIBWC. A mitigation plan for soil borrow easements is described on a conceptual level in Section 6.

No-Footprint Expansion Alternative

Under this alternative, improvements to the Hidalgo Protective Levee System would require use of soil borrow easements to increase levee height. The estimated extent of the excavation would be 13,400 cubic yards, or about 3 acres at an average depth of 6 feet. Soil would be fully obtained from grassland areas within the USIBWC borrow easement #2, which represents about one half of the site vegetation cover. No adverse impacts would be anticipated as a result of soil removal under the No-Footprint Expansion Alternative because the acreage is small, and the value of site grasslands that are typically dominated by bufflegrass, an invasive species, is relatively low for wildlife habitat.

Partial Levee Rerouting Alternative (Phase 2 Proposed Action)

Under this alternative, improvements to the Hidalgo Protective Levee System would require use of soil borrow easements to increase levee height. The estimated extent of the excavation would be 168,029 cubic yards, or about 16.7 acres at an average depth of 6 feet. Acquisition of soil would require excavation at both USIBWC borrow easements within the Pate Bend Tract of the LRGV National Wildlife Refuge. Excavation at these easements, however, would have adverse impacts to thorn woodland, which is a valuable wildlife habitat.

Soil types similar to those present in the USIBWC borrow easements (Rio Grande silt loam, Rio Grande silty clay loam, and Zalla silt loam) are present at other locations within the Pate Bend Tract which have low quality grassland habitat. Use of alternate sites within the tract is under joint consideration by the USFWS and the USIBWC. A mitigation plan for soil borrow easements is described at a conceptual level in Section 6.

5.5 COMMUNITY RESOURCES

5.5.1 Socioeconomics

The economic region of influence for this assessment is considered to be Hidalgo County. Potential socioeconomic impacts to the region of influence by each alternative are measured by direct and indirect changes to employment, business sales volume, and personal income. Economic impacts of the levee improvements project were evaluated on the basis of the construction cost of each alternative, as presented in Table 5.4. Unit costs used in the calculations reflect April 2005 estimates by the USIBWC.

Direct employment reflects those workers who would accomplish activities. The increase in business volume reflects increases in the sales of goods, services, and supplies associated with project construction activity. Personal income represents the earnings of employees in the construction, retail, wholesale and service establishments who are initially or directly affected by the construction activity. Indirect employment pertains to those jobs in the retail, wholesale, and service industries generated as a result of the proposed project. Income and business sales are indirectly impacted by the indirect increase in sales and employment resulting from the initial economic impacts.

Table 5.4 Costs Associated With Phase 2 Construction Alternatives

		Cost Per Alternative		
CONSTRUCTION	**Unit Cost per Mile**	**Footprint Expansion**	**No-Footprint Expansion**	**Partial Rerouting**
Increase Levee Height	$1,195,030 *	$ 1,195,030	$ 239,006	$ 358,509
New Floodwalls	$ 1,450,200 *	$ 362,550	$ 435,060	$ 217,530
Mechanically-stabilized levee	$ 2,900,400 **	--	$ 2,465,340	--
New Levees	$ 2,684,000 *	--	--	$ 2,013,000
Channel Crossing	$ 26,840,000 ***	--	--	$ 1,342,000
Total		**$ 1,557,580**	**$ 3,139,406**	**$ 3,931,039**

* *USIBWC unit cost estimates, updated April 20, 2005.*

** *Assumed to be twice the cost of a new floodwall.*

*** *Crossing cost was estimated at 10 times the linear cost of a new 15-foot tall levee*

Potential changes in employment, income and sales volume were calculated on the basis of unit values for construction costs calculated from a similar USIBWC levee improvement project in the Rio Grande (Parsons, 2004). Project costs were assumed to fully represent local expenditures since labor, materials, and equipment could be largely obtained from Hidalgo County. Unit values used in evaluating socioeconomic effects of levee construction are as follows:

- Employment: 31 additional jobs created (19 direct and 12 indirect) for a $1,000,000 increase in local expenditures by levee construction.
- Sales: $3,389,000 sales increase for a $1,000,000 increase in local expenditures by levee construction ($1,274,000 and $2,115,000 in direct and indirect sales, respectively).
- Income: $1,007,000 increase in income for a $1,000,000 increase in local expenditures by levee construction ($555,000 and $452,000 in direct and indirect income, respectively).

Phase 2 No Action Alternative

Under the No Action Alternative, construction activities would not take place. Consequently, there would no change to existing socioeconomic resources.

Phase 2 Footprint Expansion Alternative

The alternative would have short-term beneficial economic impacts to the local economy. Employment generated by construction activities would result in wages paid, increase in business sales volume, and expenditures for local and regional services, materials, and supplies. The Phase 2 Footprint Expansion Alternative would generate small increases in direct and indirect employment (49 temporary jobs created), sales volume ($5,279,904), and income ($1,569,290). Table 5.5 summarizes the economic impact of the alternative relative to Hidalgo County values. The project economic input would represent less than 0.1 percent of the annual values at the county level.

Table 5.5 Economic Impacts of Phase 2 Alternatives

Alternative	Construction Cost	Increase in Employment	Increase in Sales	Increase in Income
Footprint Expansion Alternative	$ 1,557,580	49	$ 5,279,904	$ 1,569,290
No-Footprint Expansion Alternative	$ 3,139,406	98	$ 10,639,487	$ 3,167,537
Partial Levee Rerouting Alternative	$ 3,931,039	123	$13,361,310	$ 3,971,240
Reference Values for Hidalgo County	-	*180,121* *	*$10,375 millions* **	*$5,637 millions* ***
Values as a Percent of Hidalgo County:				
Footprint Expansion Alternative	-	0.027 %	0.052 %	0.028 %
No-Footprint Expansion Alternative	-	0.054 %	0.105 %	0.056 %
Partial Levee Rerouting Alternative	-	0.068 %	0.132 %	0.070 %

* *Total of the labor force (16 years and older) employed in 2000 (U.S. Census Bureau, 2000).*
** *Gross sales for Hidalgo County in 2004 (Texas Comptroller, 2005).*
*** *Based on a 2000 per capita income of $9,899 and 2000 Hidalgo County population of 569,463 (U.S. Census Bureau, 2000).*

No-Footprint Expansion Alternative

The estimated construction cost of the No-Footprint Expansion Alternative is $3,139,406. As summarized in Table 5.5, positive effects of the project on economic indicators for Hidalgo County would be minor. These effects include changes in direct and indirect employment (98 temporary jobs created), changes in sales volume ($10,657,235) and changes in direct and indirect income ($3,167,537). In all cases, positive economic input from the project into the local economy represents only a minor fraction of the annual values at the county level (less than 0.2 percent).

Partial Levee Rerouting Alternative (Phase 2 Proposed Action)

The estimated construction cost of the Partial Levee Rerouting Alternative is $3,931,039. As summarized in Table 5.5, minor positive changes from the project to economic indicators for Hidalgo County would occur. These include changes in direct and indirect employment (123 temporary jobs created), changes in direct and indirect sales volume ($13,861,310) and changes in direct and indirect income ($3,971,240). In all cases, positive economic input from the project into the local economy represents only a minor fraction of the annual values at the county level (less than 0.2 percent).

5.5.2 Environmental Justice

Evaluation criterion considered in the analysis of the impacts to environmental justice was a disproportionate number of minority or low-income populations affected by proposed construction activities.

Phase 2 No Action Alternative

Under the No Action Alternative, improvements to the Hidalgo Protective Levee System would not occur; therefore, the situation for minority and low-income populations would remain unchanged.

Phase 2 Footprint Expansion Alternative

Data indicate that Hidalgo County has disproportionately high minority (approximately 88 percent) and low-income populations (individuals – 35.9 percent); however, construction activities would not occur in residential or workplace areas associated with these populations. Adverse impacts to disproportionately high minority and low-income populations from construction activities associated would not occur.

No-Footprint Expansion Alternative

Impacts associated with implementation of the No-Footprint Expansion Alternative would be the same as those described under the Footprint Expansion Alternative.

Partial Levee Rerouting Alternative (Phase 2 Proposed Action)

Impacts associated with implementation of the Partial Levee Rerouting Alternative would be the same as those described under the Footprint Expansion Alternative.

5.5.3 Transportation

Phase 2 No Action Alternative

No impacts are anticipated because the current configuration of the levee system would be retained.

Phase 2 Footprint Expansion Alternative

Improvements to the Hidalgo Protective Levee System under this alternative would only have moderate and temporary impacts to local transportation. During the proposed levee construction, a short-term increase in the use of access roads would be required for placement of equipment in staging areas. Most of the subsequent construction activities, however, would require minimum public road use because material borrow sites would be located in undeveloped lands near the construction site within the Pate Bend Tract of the LRGV National Wildlife Refuge.

No-Footprint Expansion Alternative

Improvements to the Hidalgo Protective Levee System under this alternative would only have moderate and temporary impacts to local transportation by short-term increase in the use of access roads for placement of equipment in staging areas. The raised concrete structure with guardrails could limit potential use of the levee crown as a service road for mobilization of USIBWC maintenance equipment.

Partial Levee Rerouting Alternative (Phase 2 Proposed Action)

Improvements to the Hidalgo Protective Levee System under this alternative would only have moderate and temporary impacts to local transportation by short-term increase in the use of access roads for placement of equipment in staging areas. Most of the subsequent construction activities would require minimum public road use because material borrow sites would be located in undeveloped land near the construction area.

5.6 ENVIRONMENTAL HEALTH

5.6.1 Air Quality

Hidalgo County is located within AQCR 213, which is under attainment status for all criteria pollutants. Impacts to air quality in attainment areas would be considered significant if pollutant emissions associated with the implementation of the proposed improvements to the Hidalgo Protective Levee System caused or contributed to the exceedance of any national, state, or local ambient air quality standard; exposed sensitive receptors to substantially increased pollutant concentrations; represented an increase of 10 percent or more in the AQCR's emissions inventory; or exceeded criteria established by the State Implementation Plan.

Air emissions were calculated for each alternative on the basis of unit annual releases listed in Table 5.6. Unit air emissions estimates for each activity was based on common construction practices and methods (Means 2002) and emission factors reported by USEPA (USEPA, 1996), as applied to a similar levee expansion project in an upper reach of the Rio Grande (Parsons, 2003). Unit emissions were then multiplied by alternative-specific affected areas, previously summarized in Table 2.2, to estimate air emissions for each alternative.

Phase 2 No Action Alternative

No impacts to air quality are anticipated under the No Action Alternative, as current levee configuration would be retained.

Table 5.6 Annual Unit Emission Rates for Rio Grande Levee Improvement Projects

		Emissions per Unit Action (tons/year)*				
Action	**Calculation Basis**	**Sulfur Oxides**	**Nitrogen Dioxide**	**Carbon Monoxide**	**Volatile Organic Compounds**	**Particulate Matter (PM_{10})**
Increase levee height	Per mile	0.55	5.05	2.11	0.40	5.61
Construction of new floodwalls	Per mile	0.09	0.88	1.05	0.09	0.30
Excavation (soil borrow easements)	Per acre	0.08	0.75	0.32	0.06	1.49
Construction of new levees	Per mile	0.92	8.44	3.52	0.67	11.1
Mechanically-stabilized levee **	Per mile	0.55	5.05	2.11	0.40	5.61
Channel crossing ***	Per mile	9.2	84.4	35.2	6.7	110.9

** Data from Table 4.11-1 of the Draft Environmental Impact Statement – River Management Alternatives for the Rio Grande Canalization Project (Parsons, 2003).*

*** Assuming same emissions as increasing the levee height.*

**** Assuming 10 times the emissions of constructing a new levee.*

Phase 2 Footprint Expansion Alternative

Improvements to the Hidalgo Protective Levee System through Phase 2 of the Footprint Expansion Alternative would not impact air quality through excavation and fill activities. A slight increase in localized criteria air pollutants would occur due to emissions associated with construction of the new flood wall, increasing the existing levee height, and excavating within the soil borrow easement. Table 5.7 summarizes the estimated criteria pollutant emissions associated with Phase 2 alternatives, as well as the percent increase above the existing Hidalgo County emissions inventory. Criteria pollutant increases in Hidalgo County by levee construction under the Phase 2 Footprint Expansion Alternative would range from 0.004 to 0.12 percent and are not regionally significant.

Table 5.7 Potential Air Emissions of Phase 2 Alternatives

Emissions by Alternative	Emissions (tons per year)				
	Sulfur Oxides	Nitrogen Dioxides	Carbon Monoxide	Volatile Organic Compounds	Particulate Matter (PM_{10})
Phase 2 Footprint Expansion Alternative	1.31	12.17	5.32	0.97	19.39
No-Footprint Expansion Alternative	1.09	10.14	4.48	0.81	15.07
Partial Levee Rerouting Alternative	2.66	24.72	10.53	1.97	40.47
Hidalgo County Emissions Inventory (USEPA, 1999)	*1,127*	*19,726*	*151,085*	*27,812*	*61,819*
Emissions as a Percent of County:					
Footprint Expansion Alternative	0.12%	0.06%	0.004%	0.004%	0.03%
No-Footprint Expansion Alternative	0.10%	0.05%	0.003%	0.003%	0.02%
Partial Levee Rerouting Alternative	0.24%	0.13%	0.007%	0.007%	0.07%

No-Footprint Expansion Alternative

Improvements to the Hidalgo Protective Levee System through the No-Footprint Expansion Alternative would not impact air quality through excavation and fill activities. A slight increase in localized criteria air pollutants would occur due to emissions associated with construction of the new flood wall, increasing the existing levee height, mechanically stabilizing the levee, and excavating within the soil borrow easement. Table 5.7 summarizes the estimated criteria pollutant emissions associated with this alternative, as well as the percent increase above the existing Hidalgo County emissions inventory. Criteria pollutant increases in Hidalgo County by levee construction under the No-Footprint Expansion Alternative would range from 0.003 to 0.10 percent and are not regionally significant.

Partial Levee Rerouting Alternative (Phase 2 Proposed Action)

Improvements to the Hidalgo Protective Levee System through the Partial Levee Rerouting Alternative would not impact air quality through excavation and fill activities. A slight increase in localized criteria air pollutants would occur due to emissions associated with construction of the new flood wall, increasing the existing levee height, channel crossing, construction of the new levee, and excavating within the soil borrow

easement. Table 5.7 summarizes the estimated criteria pollutant emissions associated with this alternative, as well as the percent increase above the existing Hidalgo County emissions inventory. Criteria pollutant increases in Hidalgo County by levee construction under the Partial Levee Rerouting Alternative would range from 0.007 to 0.24 percent and are not regionally significant.

5.6.2 Noise

Evaluation criteria considered for measuring the impacts from noise were based on the degree to which noise levels generated by environmental measures would be higher than ambient noise levels and the degree to which there would be annoyance, activity interference, and/or hearing loss.

Estimates of noise generated from heavy construction equipment were calculated for the environmental measures based on the type of heavy equipment used and the duration of the maintenance or construction activity. Predicted noise levels for each type of equipment anticipated to be used for the environmental measures are standard values published by the United States Army's Construction and Engineering Research Laboratory (CERL 1978).

Assuming that noise from the construction equipment radiates equally in all directions, the sound intensity would diminish inversely as the square of the distance from the source. Therefore, in a free field (no reflections of sound), the sound pressure level decreases 6 dBA with each doubling of the distance from the source.

Phase 2 No Action Alternative

No impacts from noise are anticipated under the Phase 2 No Action Alternative, as the current levee configuration would be retained.

Phase 2 Footprint Expansion Alternative

For the purposes of this assessment, it is estimated that the shortest distance between an equipment noise source and a receptor in a rural area would be a person(s) 100 feet off-site. Given the rural nature and low population density of the area, it is unlikely a person other than a worker would be within 100 feet of the site boundary during construction or excavation activities associated with this alternative. However, if a person were within this distance, the person could be exposed to noise as high as 74 to 83 dBA. As stated in Subsection 3.5.2, DNL 75 dBA during the noise event indicates a good probability for frequent speech disruption, producing ratings of "barely acceptable" for intelligibility of spoken material. Increasing the level of noise to 80 dBA reduces the intelligibility to zero, even if the people speak in loud voices.

The potential for hearing loss involves direct exposure on a regular, continuing, long-term basis to DNL levels above 75 dBA. Hearing loss projections are based on an average daily outdoor exposure of 16 hours over a 40-year period. It is anticipated the construction activities would occur between 7:30 a.m. and 4:00 p.m., 5 days per week for the duration of the project. However, individuals would not be exposed to the entire

noise-producing period. Under these conditions, persons would not be exposed to long-term and regular noise above 75 dBA. Therefore, nearby persons should not experience loss of hearing, but may experience frequent speech disruption.

As with the rural area, it is estimated the shortest distance between an equipment noise source and a receptor in an urban setting would be a person(s) or a structure 100 feet from the source. Due to the potential for reflected sound in an urban area, it is estimated sound would attenuate 4 to 5 dBA as the distance doubles. Therefore, a person in an urban area conservatively could be exposed to noise as high as 76 to 85 dBA, or about 2 dBA greater than the rural area noise. An increase of 3 dBA is just perceptible to the human ear (Bies and Hanson 1988). The difference in noise in the two settings likely would be imperceptible and the discussion and analysis in the previous paragraphs for a rural area applies to the noise condition in an urban setting. Interior noise levels would be reduced from the 76 to 85 dBA level by approximately 18 to 27 dBA due to the noise level reduction properties of the building's construction materials (U.S. Department of Transportation 1992). Reduction of interior noise levels during floodwall construction would be relevant for the operation of the Hidalgo Historic Pumphouse which currently serves as a museum and the City of Hidalgo visitors center.

No-Footprint Expansion Alternative

The No-Footprint Expansion Alternative would require construction of a mechanically-stabilized earth structure along the existing levee crown. Noise generating activities for this alternative would be the same as the Footprint Expansion Alternative. Therefore, the analysis and conclusions for the Footprint Expansion Alternative applies to this alternative.

Partial Levee Rerouting Alternative (Phase 2 Proposed Action)

The Partial Levee Rerouting Alternative includes construction of a new 0.7-mile levee segment along the south margin of the intake channel. Under this alternative, construction activity would increase from previous alternatives due to the additional use of cranes and other mechanical dredging equipment. However, noise-generating activities for this alternative would essentially be the same as the Footprint Expansion Alternative. Therefore, the analysis and conclusions for the Footprint Expansion Alternative apply to this alternative.

5.6.3 Hazardous and Toxic Waste

Phase 2 No Action Alternative

No impacts from noise are anticipated under the Phase 2 No Action Alternative, as the current levee configuration would be retained.

Phase 2 Footprint Expansion Alternative

Improvements to the Hidalgo Protective Levee System would not be affected by waste storage and disposal sites. Three fuel storage sites and an inactive storage facility were identified within 0.25 mile of the proposed levee improvement project, all located

within the City of Hidalgo (Subsection 3.6.3). None of these sites would affect, or be affected by, the proposed levee improvement project.

No-Footprint Expansion Alternative

As in the case of the Phase 2 Footprint Expansion Alternative, improvements to the levee system under the No-Footprint Expansion Alternative would not affect, or be affected by, waste storage and disposal sites.

Partial Levee Rerouting Alternative (Phase 2 Proposed Action)

As in the case of the Phase 2 Footprint Expansion Alternative, improvements to the levee system under the Partial Levee Rerouting Alternative would not affect, or be affected by, waste storage and disposal sites.

5.7 INDIRECT AND CUMULATIVE EFFECTS

Phase 2 No Action Alternative

No impacts would occur because the current configuration of the Hidalgo Protective Levee System between levee miles 3.3 to 4.5 would be retained.

Phase 2 Footprint Expansion and No-Footprint Expansion Alternatives

TPWD Birding Center. Floodwall construction would have a potential adverse impact on a plan by the TPWD to develop a birding center next to the Hidalgo Historic Pumphouse. The floodwall would obstruct the view as well as direct access from the museum to the trail system along the intake channel. The floodwall would also obstruct access to the Hidalgo Bend Tract of the LRGV National Wildlife Refuge in the area immediately adjacent to the pumphouse site.

Hidalgo Hike and Bike Trail. The trail segment that overlaps with the levee, approximately 1 mile, may require partial modification during Phase 2 levee construction. The trail system concept was designed on the basis of the existing levee elevation, before the need to raise the levee height was documented.

Border Patrol Activities. Following completion of the proposed levee improvement project, the levee road would continue providing service for Border Patrol activities. The increased levee elevation has a potential to facilitate patrol activities by providing an improved line of vision from the levee road.

Partial Levee Rerouting Alternative (Phase 2 Proposed Action)

TPWD Birding Center. Levee rerouting would eliminate the need for a floodwall along the Hidalgo Historic Pumphouse and Old Hidalgo Pumphouse Site of the World Birding Center.

Hidalgo Hike and Bike Trail. Potential modification of the trail system along the levee during Phase 2 construction would be limited to a 0.4-mile segment.

City of Hidalgo Right-of-Way. The partially rerouted levee segment along the south margin of the intake channel would run primarily along the City of Hidalgo ROW. No adverse impacts due to the levee rerouting are anticipated on the future use of City land to access the TPWD nature trail system along the intake channel and the LRGV National Wildlife Refuge. The new levee path would facilitate such access, and provide an alternate path for the Hidalgo Hike and Bike Trail project along the undeveloped margin of the intake channel.

Border Patrol Activities. Levee rerouting along the south margin of the intake channel would have potential beneficial impacts in terms of levee road use by the Border Patrol and the USFWS. For Border Patrol activities, the rerouted levee segment would provide more efficient vehicular access to the undeveloped margin of the channel, and an improved line of vision. This levee location and improved line of vision, in turn, would allow better management of trails within the LRGV National Wildlife Refuge by limiting vehicular access to assigned roads jointly identified by the USFWS and the Border Patrol.

SECTION 6
MITIGATION ACTIONS

Section 6 describes mitigation measures under consideration for potential direct impacts of the Alternatives for Improved Flood Control of the Hidalgo Protective System. Mitigation addresses the use of soil borrow easements located within the LRGV National Wildlife Refuge, potential loss of wetlands, and mitigation of adverse effects on cultural resources.

6.1 SOIL BORROW EASEMENTS

All action alternatives under consideration, both during Phases 1 and 2 of the levee improvement project, require use of soil borrow sites. Following completion of the Hidalgo Levee System over 30 years ago, the USIBWC retained use of two borrow easements covering approximately 54 acres of agricultural land. That land was subsequently acquired by the USFWS as part of the Pate Bend Tract of the LRGV National Wildlife Refuge. Vegetation within the easements is predominantly thorn woodland, considered valuable wildlife habitat.

As a mitigation option for the use of existing soil borrow easements within the Pate Bend Tract, the USIBWC, in cooperation with the USFWS, evaluated the potential for using excavation areas in bufflegrass-dominant grasslands within the refuge located outside easement boundaries. Excavation within those areas would provide levee material while creating depressional areas, including moist-soil impoundments, that would be managed for modified wildlife habitat. Excavations within bufflegrass areas would achieve two goals:

- Nearly all the 106 acres of high quality wildlife habitat present in the tract, represented by thorn woodlands, would be retained in its current condition; and

- The relocated excavation areas would provide opportunities for creation of wetlands and other wildlife habitat by planned changes in topography and substitution of a grass cover currently dominated by bufflegrass, an invasive species. Restoring woodlands and other native habitats, in conjunction with excavation and removal of invasive grasses, would be consistent with USFWS management goals for the LRGV National Wildlife Refuge.

A conceptual Soil Excavation Plan was developed by the USIBWC for accessing and removing borrow material from refuge land. The conceptual plan, currently under evaluation by the USFWS refuge staff, is intended not only to minimize impacts to wildlife, but also to enhance wildlife value where feasible. The key strategy is removal of soil from grassland areas to avoid impacts to woody vegetation, and create moist soil impoundments through excavation techniques. In addition, excavation activities would be conducted according to site-specific best management practices, and scheduled to take into account breeding seasons for most migratory birds and sensitive wildlife species.

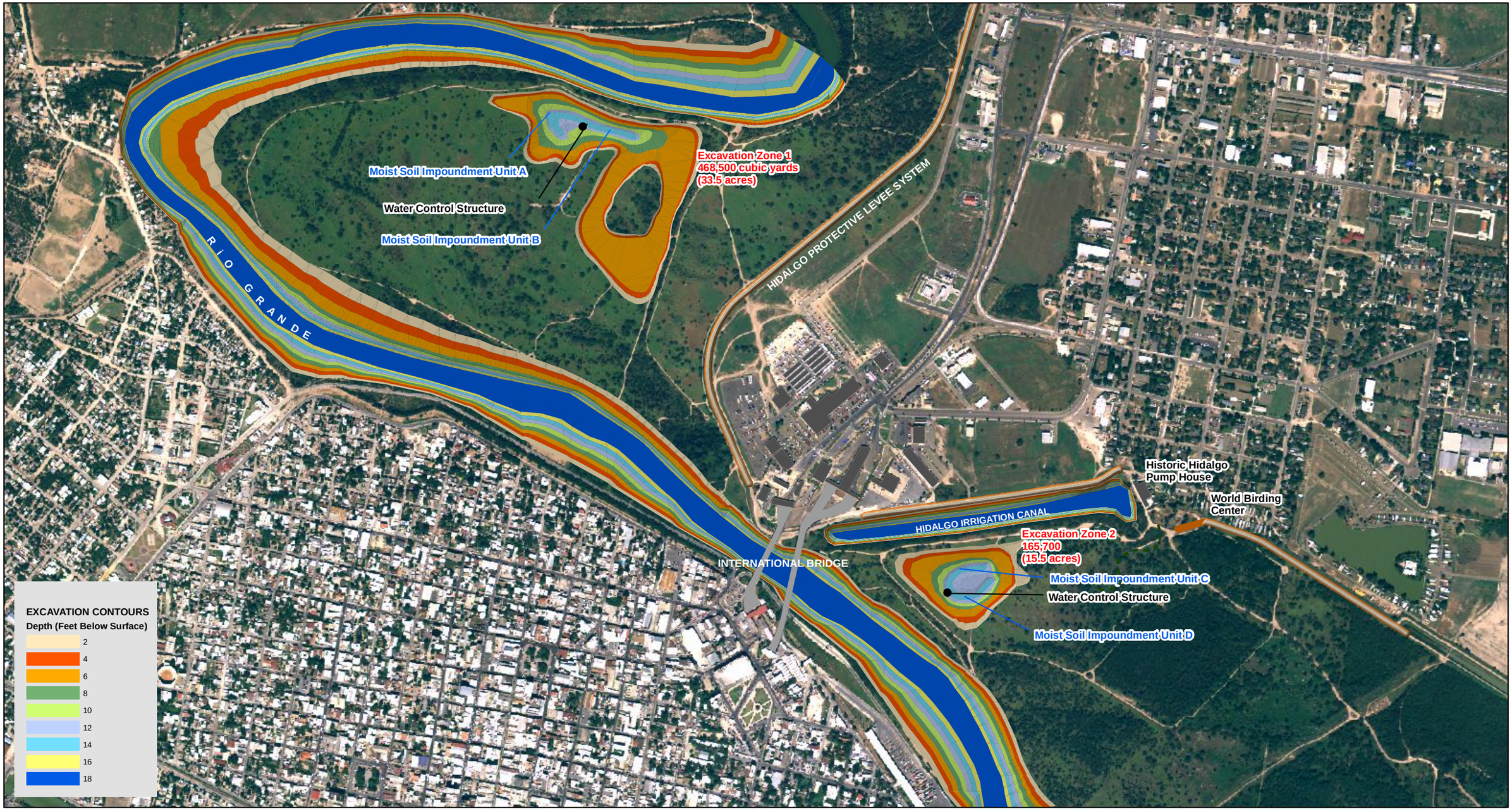
Figure 6.1 presents a conceptual soil excavation plan developed for the levee improvement project. Excavation cells would be located in open, grassed areas of the Pate Bend and Hidalgo Bend Tracts of the LRGV National Wildlife Refuge. Excavation within the Pate Bend Tract would roughly provide the estimated 356,000 cubic yards for Phase 1 improvements; excavation within the Hidalgo Bend Tract would supply up to 163,000 cubic yards for levee rerouting in Phase 2. Within each excavation cell, a series of terraces at roughly 2-foot intervals would gradually transition into the next lower level. Two deeper and narrower wetlands would be excavated in a C-shaped, Resaca-type configuration. A depth of 15 feet was selected as the initial target for groundwater level, based on data from a geotechnical investigation conducted in 1971 for construction of the Hidalgo Protective Levee System (USIBWC 1971). During that investigation, groundwater was detected in three boreholes at depths ranging from 13 to 17 feet. The shape of the excavation areas generally reflect boundaries of three soil types identified as suitable for levee construction in the 1971 geotechnical investigation, modified to retain existing access roads and significant tree clusters: Zalla silt loam, Rio Grande silty clay loam, and Rio Grande silt loam.

6.2 WETLANDS AND WATERS OF THE UNITED STATES

Phase 2 Partial Levee Rerouting Alternative has the potential to impact wetlands and waters of the United States as the new levee path along the south margin of the Hidalgo Historic Pumphouse intake channel would require crossing of the channel to connect with the new floodwall along the Hidalgo-Reynosa International Bridge. Impacts to waters of the United States would require a Department of the Army permit under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. The required permit would address wetlands mitigation, threatened and endangered species, and best management practices for construction activities and protection of water quality according to TCEQ requirements. To facilitate the permitting application process, the USIBWC participated in a Pre-Application/Joint Evaluation Meeting on March 12, 2005 with the USACE, the USFWS, and the TPWD concerning the levee improvement alternatives under consideration. The conceptual soil excavation plan described in Section 6.1 includes development of two excavation cells containing wetlands.

6.3 HISTORICAL AND ARCHAEOLOGICAL RESOURCES ALONG THE HIDALGO PROTECTIVE LEVEE SYSTEM

Based on project review under Section 106 of the NHPA of 1966, the USIBWC and the THC will enter into a Memorandum of Agreement to define the terms under which the adverse effect on the Hidalgo Historic pump house could be mitigated. The selection of the Partial Levee Rerouting Alternative by the USIBWC and other levee configurations would reduce the potential adverse effect of obscuring the south elevation of the building and view from the property. In addition the Memorandum of Agreement would address the mitigation for the impact on potential archaeological resources. An archaeological survey would be conducted for new construction areas and borrow locations, and detailed procedures specified for avoidance or mitigation of any significant archaeological deposits discovered during surveys or testing.



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0 500 1,000 2,000 3,000 4,000 Feet

0 200 400 800 1,200 1,600 Meters

PARSONS

Figure 6.1
Conceptual Soil Excavation Plan

Hidalgo Levee Environmental Assessment
International Boundary and Water Commission,
United States Section
September 2005

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SECTION 7
CONSULTATION AND COORDINATION

7.1 CONSULTATION PROCESS

7.1.1 Cooperating Agency Support

A letter of cooperation in the preparation of this Environmental Assessment was sent by the USIBWC in March 2005 to various potential stakeholders. The USFWS and the TPWD agreed to provide technical support and review in the preparation of this document.

7.1.2 Identification of Potential Impacts and Issues

Meetings

Four following meetings were held between the USIBWC and City of Hidalgo and regulatory agency representatives to identify issues and concerns related to the levee improvement project. Meeting dates, locations, and attendees are listed below.

February 16, 2005, site visit and meeting at the City of Hidalgo Historic Pumphouse. Attendees:

- City of Hidalgo: Joe Vera, Chuck Snyder.
- U.S. Fish and Wildlife Service (USFWS): Jeff Ruppert, Ernesto Reyes, Christina R. Montoya.
- U.S. Customs and Border Protection: Juan A. Lopez.
- USIBWC: Sylvia Waggoner, Rick Reyes.
- Parsons: R.C. Wooten, Carlos Victoria-Rueda, James Hinson.

March 12, 2005: Joint Interagency Evaluation Meeting at the Corpus Christi Field Office, Galveston District of the U.S. Army Corps of Engineers (USACE). Attendees:

- USACE: Lloyd Mullins
- USFWS: Larisa Ford, Pat Clements.
- Texas General Land Office: Chris Conner, Heid Cys.
- USIBWC: Sylvia Waggoner, Rick Reyes.
- Parsons: Carlos Victoria-Rueda, James Hinson.

April 26, 2005, meeting organized by the City of Hidalgo at the Historic Pumphouse. Attendees:

- City of Hidalgo: Joe Vera, Chuck Snyder.
- City of McAllen: George Ramon.
- USFWS: Jeff Ruppert.
- Texas Parks and Wildlife Department (TPWD): Russell Hooten, Sumita Prasad (World Birding Center).
- Texas Department of Transportation: Stanley Ramos, Hector Gonzalez, Mario A. Salinas, Elma Hehenuken.
- U.S. Customs and Border Protection: Eduardo Payan, Mike Van Hook.
- Hidalgo County Irrigation District No. 2: Sonny Hinojosa.
- USIBWC: Raymundo Aguirre, Rick Reyes, Gary Jones.
- Parsons: R.C. Wooten, Carlos Victoria-Rueda.
- Halff Associates: Robert L. Saenz.

May 24, 2005, meeting at the Texas Historic Commission (THC) in Austin. Attendees:

- THC: F. Lawrence Oaks (Executive Director), Mark H. Denton, Amy Hammons, Debra Beene, Hanna Vaughan.
- USIBWC (via conference call): Steve Smullen, Raymundo Aguirre, Rick Reyes.
- Parsons: R.C. Wooten, Carlos Victoria-Rueda.
- LGGROUP (via conference call): Steve Gaither.

Consultation Letters

Letter of consultation on potential effects of the levee improvement project were sent on April 11, 2005 to potential stakeholders along with a Preliminary Description of Alternatives. Attachment A provides copy of the consultation letter and the following responses received by the USIBWC:

- U.S. Customs and Border Protection, April 19, 2005.
- General Services Administration, April 22, 2005.
- Texas Commission on Environmental Quality, April 28.
- Texas Parks and Wildlife, May 2, 2005.
- U.S. Fish and Wildlife Service, May 17, 2005.
- City of Hidalgo, June 14, 2005.
- Texas Historical Commission, June 20, 2005.

7.1.3 Draft EA Review

The Draft EA was distributed on July 7, 2005 for a 30-day review period. Copies of the document were sent to federal agencies (USFWS, USACE, USEPA, NRCS, GSA, U.S. Customs and Border Protection), state agencies (THC, TPWD, TCEQ, Texas Department of Transportation), and the cities of Hidalgo and McAllen.

Comments on the Draft EA were received from TCEQ, NRCS, the City of Hidalgo, and THC (Appendix B). Recommendations received, dealing primarily with the cultural resources evaluation, have been addressed in this Final EA.

7.2 PERSONS AND AGENCIES CONSULTED

Consultation on biological, cultural and water resources, and land issues, has been in writing, by phone, or during consultation meetings with agency and city representatives listed below.

Biological Resources

Jeff Rupert, Refuge Manager
Lower Rio Grande Valley National Wildlife Refuge
U.S. Fish and Wildlife Service

Ernesto Reyes
Ecological Services
U.S. Fish and Wildlife Service

Kathy Boydston
Wildlife Habitat Assessment Program
Texas Parks and Wildlife Department

Cultural Resources

Mark H. Denton
Director, State & Federal Review Section
Archaeology Division
Texas Historical Commission

Amy Hammons
Division of Architecture
Texas Historical Commission

Chuck Snyder
Old Hidalgo Pumphouse Director
City of Hidalgo

Water Resources

Lloyd Mullins, Unit Leader
Corpus Christi Field Office, Galveston District
U.S. Army Corps of Engineers

Mark Fisher
Water Quality Division
Texas Commission on Environmental Quality

Land Use Issues

Tim Meade
Environmental Affairs Division
Texas Department of Transportation

Elaine Dill
Texas Parks and Wildlife Department
Grants and Aid

Joe Vera, III
City Manager
City of Hidalgo

George Ramon
Director, International Toll Bridge
City of McAllen

Lisa Schaub
NEPA Advisory Group
General Services Administration

Reynaldo Garza
Deputy Chief Patrol Agent, McAllen Sector
U.S. Customs and Border Protection

7.3 LIST OF CONTRIBUTORS

Tables 7.1 and 7.2 list contributors to the preparation of the Environmental Assessment for the Alternatives for Improved Flood Control of the Hidalgo Protective Levee System, and development of technical support studies.

Table 7.1 Preparers of the Environmental Assessment and Technical Studies

Name	Organization	Degree	Years Experience	Project Role
R. C. Wooten	Parsons	Ph.D. Biology/Ecology	34	Technical director; NEPA compliance
Carlos Victoria-Rueda.	Parsons	Ph.D., Environmental Engineering	22	Project manager; water and soil analyses
James Hinson	Parsons	M.S. Wildlife Science	16	Vegetation, wetlands and wildlife analyses; field studies supervision
Eric Dawson, P.E.	Parsons	M.S., Environmental Engineering	17	Levee footprint analysis
Namir Najjar	Parsons	Ph.D., Water Resources Engineering	9	Hydraulic modeling
Taylor Houston	Parsons	M.S, Geography-Environmental Resources	6	Biology field studies, land use, and GIS analysis
Justin Kirk	Parsons	B.S. Agricultural Development	8	Community resources and environmental health
Sherrie Keenan	Parsons	B.A., Journalism	27	Technical editor
Steve Gaither	LGGROUP	B.A., English	16	Archaeology evaluation
Sherry N. DeFreece Emery	LGGROUP	M.S. Historic Preservation	7	Historic resources evaluation

Table 7.2 Technical Review of the Environmental Assessment

Name	Agency	Degree	Years Experience	Project Role
Daniel Borunda	USIBWC Environmental Protection	M.S., Fisheries and Wildlife Science	8	Project manager; biology, NEPA compliance; document review
Steve Smullen	USIBWC Engineering Division	M.S., Environmental Engineering	26	Engineering, hydraulics and hydrology; document review
Raymundo Aguirre	USIBWC Engineering Division	Ph.D. Civil Engineering	49	Engineering, hydraulics and hydrology; document review
Sylvia Waggoner	USIBWC Environmental Protection	B.S. Civil Engineering	16	Document review
Jeff Rupert	USFWS LRGV Nat. Wildlife Refuge	M.S. Biology	10	Document review
Ernesto Reyes	USFWS Ecological Services	M.S. Biology	14	Document review
Russell Hooten	TPWD Wildlife Division	M.S. Biology	13	Document review

SECTION 8
REFERENCES

Bies, D.A. and B.H. Hanson, 1988. *Engineering Noise Control: Theory and Practice*. Unwin Hyman, London, pp. 36-37, 1988.

Bureau of Economic Analysis 2003. U.S. Department of Commerce, BEARFACTS, 2003. [*http://www.bea.doc.gov/bea/regional/reis/action.cfm?catable=CA25N&areatype=48000&years=2003,2002,2001&fips=48215&format=htm* - website accessed June 2005].

CERL, 1978. *Construction Site Noise Control Cost-Benefit Estimating Procedures.* Construction Engineering Research Laboratory, Engineer Research and Development Center of the U.S. Army Corps of Engineers. Interim Report N-36, January 1978.

Cooper, E., N. Reese, D. Shanabrook and V. Gibbs, 2002. An Assessment of Potential Effects to Historic Properties within the Lower Rio Grande Flood Control Project by Maintenance Activities of the United States International Boundary and Water Commission. Miscellaneous Reports of Investigations No. 184. Geo-Marine, Inc., Plano, Texas.

Fermata, 2003. *The Lower Rio Grande Valley Biological Profile*. Fermata Inc., Austin, Texas. [*http://www.fermatainc.com/nat_riogrande.html* - website accessed May 2005]

Lower Rio Grande Valley Development Council, 1978. *Environmentally Sensitive Areas in the Lower Rio Grande Valley, McAllen, Texas*. Lower Rio Grande Valley Development Council. 44 p.

Means, R.S., 2002. *Building Construction Cost Data*. 54th Annual Edition, R.S. Means Company, Incorporated, Kingston, Massachusetts.

National Academy of Sciences 1977. Guidelines for Preparing Environmental Impact Statements on Noise. Report of Working Group on the Committee on Hearing, Bioacoustics, and Biomechanics, National Research Council. Washington, D.C.

Parsons, 2003. Draft Environmental Impact Statement – River Management Alternatives for the Rio Grande Canalization Project. Document prepared by Parsons for the USIBWC, December 2003.

Parsons, 2004. Final Environmental Impact Statement – River Management Alternatives for the Rio Grande Canalization Project. Document prepared by Parsons for the USIBWC, March 2004.

Parsons, 2005. Technical Support Studies Report, Environmental Assessment of Alternatives for Improved Flood Control of the Hidalgo Protective Levee System. Document prepared by Parsons for the USIBWC, June 2005. [An electronic CD version is attached inside the front cover of this document]

Sanchez, M. L. 1994. A Shared experience: the history, architecture, and historic design of the Lower Rio Grande Heritage Corridor. Los Caminos del Rio Heritage Project and the Texas Historical Commission, Austin, Texas.

SCS, 1981. *Soil Survey of Hidalgo County, Texas*. Soil Conservation Service (currently Natural Resources Conservation Service), United States Department of Agriculture.

Texas Economic Development, 2005. Hidalgo County, Texas Economic Development website. [*http://community.txed.state.tx.us/counties/county.cfm?id=48215* - accessed June 2005].

Texas Comptroller, 2005. Texas Comptroller of Public Accounts website, Quarterly Sales Tax Report for 2004, Hidalgo County. [*http://ecpa.cpa.state.tx.us/allocation/HistSalesResults.jsp;jsessionid=0000JJiEsID249mtI_9CL5H6frt:-1*]

TPWD, 2005a. Threatened and Endangered Species List for Hidalgo County, Texas. Texas Parks and Wildlife Department May 2, 2005 response to USIBWC consultation letter [*provided in Attachment A*].

TPWD, 2005b. Wetlands Restoration Plan, Resaca de la Palma State Park. April 22, 2005.

TCEQ, 2004. Year 2001 Point Source Emissions Inventory by County and Company Name (as of March 2004) [*http://www.tnrcc.state.tx.us/air/aqp/ei/hgmap.htm*]

USACE, 2003. *Condition Assessment of the U.S. International Boundary and Water Commission, Lower Rio Grande Valley Levees, South Texas*. Engineer Research and Development Center of the U.S. Army Corps of Engineers.

U.S. Department of Transportation, 1980. *Guidelines for Considering Noise in Land Use. Planning and Control*. United States Department of Transportation, Federal Interagency Committee on Urban Noise.

U.S. Department of Transportation, 1992. *Guidelines for the Sound Insulation of Residences Exposed to Aircraft Operations.* United States Department of Transportation.

U.S. Census Bureau, 2000. Annual Population Estimates by City and County, April 1, 1990 through April 1, 2000, [*http://www.census.gov/popest/counties/CO-EST2004-01.html]* accessed May 2005.

USEPA, 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. United States Environmental Protection Agency. Publication No. 550/9-74-004. Washington, D.C. March 1974.

USEPA, 1996. *Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources (AP-42).* 5th edition with Supplements, United States Environmental Protection Agency, Research Triangle Park, February 1996.

USEPA 2005. Currently Designated Nonattainment Areas for All Criteria Pollutants, United States Environmental Protection Agency, [*http://www.epa.gov/air/oaqps/greenbk/ancl.html#TEXAS* - as of April 2005].

USEPA, 1999. Emissions by Category Report - Criteria Air Pollutants – 1999. [*http://oaspub.epa.gov/airsdata/adnet.tier?geotype=co&geocode=48215&geoinfo=%3Fco%7E48215%7EHidalgo+Co%2C+Texas&pol=CO+NOX+SO2+VOC+PM25+PM10&year=1999&fld=state&fld=county&fld=tier1&rpp=25*]

USFWS, 2005a. Threatened and Endangered Species List for Hidalgo County. May 17, 2005 response by the U.S. Fish and Wildlife Service to USIBWC consultation letter [*provided in Attachment A*].

USFWS, 2005b. Preliminary review of the Environmental Assessment and Technical Support Studies for the Hidalgo Protective Levee System. Letter report provided to the USIBWC by the U.S. Fish and Wildlife Service on June 24, 2005.

USIBWC, 1971. *Hidalgo Levees Near Hidalgo, Texas*. Lower Rio Grande Flood Control Project (16 design sheets). United States Section, International Boundary and Water Commission, El Paso, Texas. March 1971.

USIBWC, 1980. Negative Impact Declaration, Operation and Maintenance of the Lower Rio Grande Flood Control Project, Texas. United States Section, International Boundary and Water Commission, El Paso, Texas.

USIBWC, 1992. Status of Conveying Capacity of the Lower Rio Grande Flood Control Project. United States Section, International Boundary and Water Commission, El Paso, Texas

USIBWC, 2003a. Hydraulic Model of the Rio Grande and Floodways Within the Lower Rio Grande Flood Control Project. United States Section, International Boundary and Water Commission, El Paso, Texas.

USIBWC, 2003b. Draft Environmental Impact Statement for Alternative Vegetation Management Practices for the Lower Rio Grande Flood Control Project: Cameron, Hidalgo, and Willacy Counties, Texas. Volume I of V, July 2003. United States Section, International Boundary and Water Commission, El Paso, Texas.

Weitze, 1992. *Registration Form*: Louisiana-Rio Grande Canal Company Irrigation System. On file, Archives Folder 78e, 78f, 78—Hidalgo Pumphouse File, Museum of South Texas History, Hidalgo, Texas.

World Wildlife Fund, 2001. Wild World Ecoregion Profile – Tamaulipan mezquital (NA1312). T. Cook, J. Adams, A. Valero, J. Schipper, and T. Allnutt. [*http://www.worldwildlife.org/wildworld/profiles/terrestrial/na/na1312_full.html; Website document dated 2001, posted in May 2005 as undergoing peer review]*

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APPENDIX A
INTERAGENCY COORDINATION CORRESPONDENCE

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International Boundary and Water Commission
United States Section
Engineering Department

4171 N. Mesa, Suite C-100
El Paso, TX 79902

April 11, 2005

Mr. Jeff Rupert, Refuge Manager
Lower Rio Grande Valley National Wildlife Refuge
U.S. Fish and Wildlife Service
Rt. 2, Box 202-A
Alamo, TX 78516

Re.: Request for review/determination of potential environmental impacts Hidalgo Protective Levee System Improvements, Hidalgo, Texas

Dear Mr. Rupert:

The United States Section, International Boundary and Water Commission (USIBWC) is preparing an Environmental Assessment (EA) for a proposed action to raise the Hidalgo Protective Levee System. This 4.5-mile segment of the Lower Rio Grande Flood Control Project was recently identified as one of the priority areas to improve flood containment.

Alternatives under consideration would increase levee height from 2 to 8 feet, increasing the levee footprint by lateral extension of the structure. Footprint increases on the riverside would extend into floodplain areas designated by the U.S. Fish and Wildlife Service as part of the Lower Rio Grande Valley National Wildlife Refuge; the refuge includes two former material borrow areas used in the 1970's for levee construction whose use in the levee improvement project is also under consideration. Levee footprint increases on the landside could extend beyond the USIBWC right-of-way.

To improve flood control in an approximately ½-mile reach adjacent to a registered historical site and museum, the Old Hidalgo Pumphouse, partially rerouting of the levee system is also under consideration. This option is an alternative to the use of a concrete floodwall along the historic pumphouse. Levee rerouting would follow the pumphouse intake channel and, to connect with the existing levee, cross near the channel opening into the Rio Grande. This alternative would potentially affect waters of the United States and wetland areas, and the historical nature of the pumphouse channel. The top of the crossing structure would be located at approximately 35 feet above the normal intake channel water level. In addition to the need to cross the channel, levee rerouting would also modify plans by the Texas Parks and Wildlife Department to use the channel margin to develop birding observation trails.

In the south section of the levee system, use of a concrete floodwall would be required between the two spans of the Hidalgo-Reynosa International Bridge and around the Border Patrol station. Also affected would be a hike and bike trail project by the City of Hidalgo and the Texas Department of Transportation that overlaps with the levee system for approximately 1 mile.

According to the National Environmental Policy Act (NEPA), the USIBWC must assess the potential environmental impacts of the proposed and alternative actions. In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs*, the USIBWC is requesting input from other federal, state, and local agencies on the proposal. Please identify any resources within your agency's purview that may be potentially impacted, and issues and concerns associated with implementing any of the alternatives. To assist your office in reviewing the alternatives, we have included a description of alternatives providing details of the action with illustrative maps of the project area and levee alignment.

Please provide any comments or information by April 29, 2005. Responses should be sent directly to:

Ms. Sylvia Waggoner
United States Section,International Boundary and Water Commission
325 Golf Course Rd.
Mercedes, TX 78570

Your assistance in providing information is greatly appreciated. If you have any questions, please call Ms. Waggoner at (956) 565-3159, Extension 232.

Sincerely,

[[[[Signed]]]]

Bernardino Olague, P.E.
Principal Engineer

Attachment:
Description of Alternatives

Same letter sent to:

Mr. Ernesto Reyes
U.S. Fish and Wildlife Service
Ecological Services
Rt. 2, Box 220-A
Alamo, TX 78516

Ms. Kelly Boydston
Texas Park and Wildlife Department
Wildlife Habitat Assessment Program
4200 Smith School Road
Austin, TX 87844-3291

Ms. Kalye Jenkins
Texas Park and Wildlife Department
CCA/CPL Marine Development Center
4300 Waldron Road
Corpus Christi, TX 78418

Mr. Lloyd Mullins
United Leader, Corpus Christi Field Office
U.S. Army Corps of Engineers
5151 Flynn Parkway, Suite 306
Corpus Christi, TX 78411-4318

Mr. Mark Fisher
Texas Commission on Environmental Quality
Water Quality Division, MC-150
P.O. Box 13087
Austin, TX 78711-3087

Mr. Tim Meade
Texas Department of Transportation
Environmental Affairs Division
125 E. 11th Street
Austin, TX 78701-2483

Ms. Elaine Dill
Texas Park and Wildlife Department
4200 Smith School Road
Austin, TX 87844-3291

Mr. Joe Vera, III, City Manager
City of Hidalgo
704 E. Texano Drive
Hidalgo, TX 78557

Mr. Reynaldo Garza
Deputy Chief Patrol Agent
U.S. Customs and Border Protection
McAllen Sector, 2301 Main Street
McAllen, TX 78503

Ms. Lisa Schaub, Environmental Advisor
General Services Administration
NEPA Advisory Group
819 Taylor Street (7PMW)
Fort Worth, TX 76102

Mr. George Ramon
Bridge Director, International Toll Bridge
City of McAllen
P.O. Box 399
Hidalgo, Texas 78557-0399

2301 South Main Street
McAllen, TX 78503-3147

U.S. Customs and Border Protection

RGV 10/2.2.1

April 19, 2005

Ms. Sylvia Waggoner
United States Section,
International Boundary and Water Commission
325 Golf Course Rd.
Mercedes, Texas 78570

Dear Ms. Waggoner,

This is in response to a letter dated April 11, 2005, from Mr. Bernardino Olague, Principal Engineer, International Boundary and Water Commission, United States Section, with respect to a request to review how the proposed action to raise the Hidalgo Protective Levee System would impact Border Patrol operations in the area under consideration.

After reviewing the proposed project, there are no major concerns regarding implementing any of the identified alternatives.

However, the following recommendations would enhance Border Patrol operational effectiveness in the area and are submitted for consideration:

- Construction of all-weather roads to ensure access to the river by BP units
- Construction of a floodwall without a slope at the Hidalgo POE to deter illegal entries

Thank you for your interest in this matter. If my office can be of further assistance, please contact Assistant Chief Patrol Agent Cruz J. Rodriguez of my staff at 956-984-3800.

Sincerely,

Lynne M. Underdown

Lynne M. Underdown
Chief Patrol Agent

GSA Public Buildings Service
Greater Southwest Region

April 22, 2005

Sylvia Waggoner
United States Section,
International Boundary and Water Commission
325 Golf Course Rd.
Mercedes, TX 78570

Dear Ms. Waggoner:

Thank you for the opportunity to review the Hidalgo Protective Levee System – Preliminary Description of Alternatives for Improved Flood Control. While the General Services Administration (GSA) has no comments at this time, we would like to be included on the distribution list for future documents. Also, we wish to ensure that Customs and Border Protection and Border Patrol, within the Department of Homeland Security, are provided the opportunity to comment. Individuals to whom correspondence can be directed are as follows:

Mr. Joe Ramos
Asst. Director Field Operations
Department of Homeland Security
Customs and Border Protection
109 Shiloh Drive, Suite 300
Laredo, TX 78045

Chief Patrol Agent Lynne Underdown
Department of Homeland Security
Border Patrol
2301 S. Main Street
McAllen, TX 78503

Regards,

Lisa Schaub
Environmental Advisor

US General Services Administration
819 Taylor Street
Fort Worth, TX 76102
www.gsa.gov

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

April 28, 2005

Ms. Sylvia Waggoner
United States Section
International Boundary and Water Commission
325 Golf Course Road
Mercedes, Texas 78570

Re: Hidalgo Protective Levee System Improvements

Dear Ms. Waggoner:

The Texas Commission on Environmental Quality (TCEQ) is in receipt of the United States Section, International Boundary and Water Commission letter, dated April 11, 2005, requesting the TCEQ to identify any resources within the agency's purview that may be potentially impacted by the proposal to raise the Hidalgo Protective Levee System and any issues or concerns associated with implementing any of the alternatives.

As stated in the Hidalgo Protective Levee System Preliminary Description of Alternatives for Improved Flood Control, dated March 2005, the United States Section, International Boundary and Water Commission proposes to raise the Hidalgo Protective Levee System, a 4.5 mile segment of the Lower Rio Grande Flood Control Project that runs along the west and south boundaries of the City of Hidalgo in south Texas. Some of the proposed alternatives could potentially affect waters of the United States (US), including wetlands. The TCEQ provides the following comments regarding the proposed Hidalgo Protective Levee System project. Responses to this letter may raise questions that will need to be addressed in the future.

1. Title 30, Texas Administrative Code (TAC), Chapter 279.11(c)(1), states that "No discharge shall be certified if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem,...." The TCEQ recommends that potential adverse impacts, including cumulative and secondary impacts, to waters of the US be avoided and minimized to the maximum extent practicable. The TCEQ recommends that detailed information describing the options that were considered to avoid and minimize impacts to waters of the US, including wetlands, be provided for review.

2. Please provide the amount and types of waters of the US, including wetlands, that would be impacted by each alternative.

3. Mitigation of impacts is considered for "all unavoidable adverse impacts that remain after all practicable avoidance and minimization has been completed" (§279.11(c)(3)). Appropriate and practicable compensatory mitigation for all unavoidable adverse impacts to waters of the US, including wetlands, should be provided. The TCEQ recommends that a proposed mitigation plan, including amount of mitigation for impact, success criteria, monitoring, and deed restriction, be submitted for review. The mitigation plan should also explain how water quality functions will be incorporated on-site.

4. The TCEQ recommends that the types of Best Management Practices to be used in order to protect water quality during the construction of the proposed project be provided.

The TCEQ appreciates the United States International Boundary and Water Commission coordinating with our agency to identify any agency concerns in the early development of the project. Please provide any comments to Ms. Lori Hamilton of the Water Quality Division MC-150, P.O. Box 13087, Austin, Texas 78711-3087. Ms. Hamilton may also be contacted by e-mail at *lhamilto@tceq.state.tx.us*, or by telephone at (512) 239-0683.

Sincerely,

L'Oreal Stepney

L'Oreal W. Stepney, Director
Water Quality Division
Texas Commission on Environmental Quality

LWS/LH/ms

May 2, 2005

Sylvia Waggoner
United States Section
IBWC
325 Golf Course Road
Mercedes, TX 78570

RE: Potential impacts associated with Hidalgo Protective Levee System Improvements, Hidalgo, Texas

Dear Ms. Waggoner:

This letter is in response to your request for information regarding the proposed levee improvement project referenced above. The International Boundary and Water Commission (IBWC) is preparing an Environmental Assessment (EA) for the proposed action. Texas Parks and Wildlife Department (TWPD) staff reviewed the information provided and offers the following comments and recommendations.

The proposed project would involve increasing the height of a 4.5 mile segment of levee in Hidalgo County, Texas. Increasing the height of the levee an average of six feet would increase the levee footprint by 36 feet; 18 feet along each side. The northern 1.5 miles of the project would occur in agricultural land; the remainder of the levee project area borders the U.S Fish and Wildlife Service (FWS) National Wildlife Refuge on one side and commercial/residential areas on the other. Four alternatives, including the no action alternative, are being considered for the levee project. The footprint expansion alternative would increase the height and the footprint of the existing levee, the partial crown height increase alternative is similar to the footprint expansion alternative but would use a stepped, bin-type wall to increase the levee crown height without increasing the footprint in a segment of the levee from Mile 3.5 to 4.5. The final alternative would be similar to the footprint expansion alternative but would reroute a segment of the levee (*i.e.*, construct a new levee segment) in the vicinity of the historic Hidalgo Pumphouse.

The EA provided for review should, at a minimum, include an inventory of existing natural resources occurring in the project area. Additionally, specific evaluations should be designed to predict project impacts upon these natural resources. Sufficient documentation should be supplied to accurately interpret the value of the natural resources involved and the extent to which the project will impact these resources. This can be accomplished with aerial and ground photography, such as provided in the current document, with overlays indicating

the extent of the project boundaries and anticipated impacts within those boundaries. More detailed information outlining the requirements and expectations of this Department concerning environmental assessment and impact statements are attached in a document entitled, "TPWD Suggested Guidelines for Preparation of Environmental Assessment Documents."

In general, TPWD recommends construction activities avoid wetland habitats, forested riparian drainages and dense, mature woody vegetation. Performing construction activities within existing right-of-ways (ROWs) and in previously disturbed areas would minimize adverse impacts to fish and wildlife resources and habitat. However, because the Lower Rio Grande Valley is one of the most biologically diverse regions in the world, potential to encounter wildlife within any of the anticipated project areas does exist. Drainages and intake channels such as occur within the proposed project area often develop vegetation along their banks that may provide food sources, cover or nesting sites for wildlife including migratory birds. These areas may especially be heavily utilized by migratory birds during fall and spring migration. The waterbodies themselves may also support other food sources (*e.g.,* insects) that may attract birds, reptiles or small mammals. Attached is the state list of rare, threatened and endangered species with potential to occur in Hidalgo County.

Regardless of the levee alternative selected, impacts upon existing native vegetation should be avoided or minimized as much as practical. Review of photographs provided in the preliminary description of alternatives report indicate that clearing of vegetation to some extent would likely be necessary for any alternative selected. Should impacts to vegetation be determined to be unavoidable, post-construction landscaping plans should incorporate the use of native vegetation that can aid in erosion control and sediment stabilization as well as benefit wildlife. Depending on the type and amount of vegetation removed, compensation in the form of mitigation may be required. The EA should include types and acreage amounts of habitats impacted by the project, as well a mitigation plan for replacing those acres of habitat lost to the project.

The Migratory Bird Treaty Act (MBTA) provides for a year round closed season for non-game birds and prohibits the taking of migratory bird nests and eggs. Construction activities such as, but not limited to, tree felling as well as vegetation clearing, trampling, or maintenance should occur outside the April 1- July 15 migratory bird nesting season of each year the project is authorized and lasting for the life of the project. To comply with the MTBA, any proposed site should be surveyed for migratory bird nest sites prior to construction or future maintenance

activities. In addition, since raptors nest in late winter and early spring, all construction activities as identified above should be excluded from a minimum zone of 100 meters around any raptor next during the period of February 1- July 15. Please contact the U.S. Fish and Wildlife Service Southwest Regional Office (Region 2) at (505) 248-6879 for further information.
Also, activities that would place fill material into waters of the United States are regulated by the U.S. Army Corps of Engineers (COE). Proposed construction activities that would impact aquatic resources (*e.g.*, levee reroute alternative) should be coordinated with the COE-Corpus Christi Field Office (361-814-5850).

I appreciate the opportunity to review and provide comments on this project. Please contact me at (361) 825-3240 if we may be of further assistance.

Sincerely,

Russell Hooten

Russell Hooten
Wildlife Habitat Assessment Program
Wildlife Division

/rh

Attachments (2)

cc: Len Polasek, Wildlife Division, Regional Director, Region IV
Steve Benn, Wildlife Division, Las Palomas WMA

HIDALGO COUNTY

	Federal Status	State Status
***** AMPHIBIANS *****		
Black Spotted Newt (*Notophthalmus meridionalis*) - can be found in wet or sometimes wet areas, such as arroyos, canals, ditches, or even shallow depressions; aestivates in the ground during dry periods; Gulf Coastal Plain south of the San Antonio River		T
Mexican Treefrog (*Smilisca baudinii*) - subtropical region of extreme southern Texas; breeds May-October coinciding with rainfall, eggs laid in temporary rain pools		T
Sheep Frog (*Hypopachus variolosus*) - predominantly grassland and savanna; moist sites in arid areas		T
South Texas Siren - large form (*Siren* sp. 1) - wet or sometimes wet areas, such as arroyos, canals, ditches, or even shallow depressions; aestivates in the ground during dry periods, but does require some moisture to remain; southern Texas south of Balcones Escarpment; breeds February-June		T
White-lipped Frog (*Leptodactylus labialis*) – grasslands, cultivated fields, roadside ditches, and a wide variety of other habitats; often hides under rocks or in burrows under clumps of grass; species requirements incompatible with widespread habitat alteration and pesticide use in south Texas		T
***** BIRDS *****		
American Peregrine Falcon (*Falco peregrinus anatum*) - potential migrant; nests in west Texas	DL	E
Arctic Peregrine Falcon (*Falco peregrinus tundrius*) - potential migrant	DL	T
Audubon's Oriole (*Icterus graduacauda audubonii*) - scrub, mesquite; nests in dense trees, or thickets, usually along water courses		
Brownsville Common Yellowthroat (*Geothlypis trichas insperata*) - tall grasses and bushes near ponds, marshes, and swamps; breeding April to July		
Cactus Ferruginous Pygmy-owl (*Glaucidium brasilianum cactorum*) - riparian trees, brush, palm, and mesquite thickets; during day also roosts in small caves and recesses on slopes of low hills; breeding April to June		T
Common Black Hawk (*Buteogallus anthracinus*) – cottonwood-lined rivers and streams; willow tree groves on the lower Rio Grande floodplain; formerly bred in south Texas		T
Gray Hawk (*Asturina nitidus*) - mature woodlands of river valleys and nearby semiarid mesquite and scrub grasslands		T
Hook-billed Kite (*Chondrohierax uncinatus*) – dense tropical and subtropical forests, but does occur in open woodlands; uncommon to rare in most of range; accidental in south Texas		
Interior Least Tern (*Sterna antillarum athalassos*) – nests along sand and gravel bars within braided streams, rivers & some inland lakes	LE	E
Mountain Plover (*Charadrius montanus*) – breeding: nests on high plains or shortgrass prairie, on ground in shallow depression; nonbreeding: shortgrass plains and bare, dirt (plowed) fields; primarily insectivorous		
Northern Beardless-tyrannulet (*Camptostoma imberbe*) - mesquite woodlands; near Rio Grande frequents cottonwood, willow, elm, and great leadtree; breeding April to July		T
Reddish Egret (*Egretta rufescens*) - resident of the Texas Gulf Coast; brackish marshes and 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		T

	Federal Status	State Status
Rose-throated Becard (*Pachyramphus aglaiae*) – riparian trees, woodlands, open forest, scrub, and mangroves; breeding April to July		T
Sennett's Hooded Oriole (*Icterus cucullatus sennetti*) - often builds nests in and of Spanish moss (*Tillandsia unioides*); feeds on invertebrates, fruit, and nectar; breeds March-August		
Tropical Parula (*Parula pitiayuma*) - dense or open woods, undergrowth, brush, and trees along edges of rivers and resacas; breeding April to July		T
White-faced Ibis (*Plegadis chihi*) - prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats		T
White-tailed Hawk (*Buteo albicaudatus*) - near coast it is found on prairies, cordgrass flats, and scrub-live oak; further inland on prairies, mesquite and oak savannas, and mixed savanna-chaparral; breeding March to May		T
Wood Stork (*Mycteria americana*) - forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including salt-water; usually roosts communally in tall snags, sometimes in association with other wading birds (i.e. active heronries); breeds in Mexico and birds move into Gulf States in search of mud flats and other wetlands, even those associated with forested areas; formerly nested in Texas, but no breeding records since 1960		T
Zone-tailed Hawk (*Buteo albonotatus*) - rough, deep, rocky canyons and streamsides in semiarid mesa, hill, and mountain terrain; breeding March to July		T

*** FISHES ***

American Eel (*Anguilla rostrata*) - most aquatic habitats with access to ocean; spawns January-February in ocean, larva move to coastal waters, metamorphose, then females move into freshwater; muddy bottoms, still waters, large streams, lakes; can travel overland in wet areas; males in brackish estuaries		
River Goby (*Awaous banana*) - clear water with slow to moderate current, sandy or hard bottom, and little or no vegetation; also enters brackish and ocean waters		T
Rio Grande Shiner (*Notropis jemezanus*) – large, open, weedless rivers or large creeks with bottom of rubble, gravel and sand, often overlain with silt		
Rio Grande Silvery Minnow (*Hybognathus amarus*) (extirpated) - historically Rio Grande and Pecos River systems and canals; pools and backwaters of medium to large streams with low or moderate gradient in mud, sand, or gravel bottom; ingests mud and bottom ooze for algae and other organic matter; probably spawns on silt substrates of quiet coves	LE	E

*** INSECTS***

Subtropical Blue-black Tiger Beetle (*Cicindela nigrocoerulea subtropica*) - most tiger beetles are active, usually brightly colored, and found in open, sunny areas; adult tiger beetles are predaceous and feed on a variety of small insects; larvae of tiger beetles are also predaceous and live in vertical burrows in soil of dry paths, fields, or sandy beaches		
Manfreda Giant-skipper (*Stallingsia maculosus*) - most skippers are small and stout-bodied; name derives from fast, erratic flight; at rest most skippers hold front and hind wings at different angles; skipper larvae are smooth, with the head and neck constricted; skipper larvae usually feed inside a leaf shelter and pupate in a cocoon made of leaves fastened together with silk-		

	Federal Status	State Status
***** MAMMALS *****		
Cave Myotis Bat (*Myotis velifer*) - roosts colonially in caves, rock crevices, old buildings, carports, under bridges, and even in abandoned Cliff Swallow (*Petrochelidon pyrrhonota*) nests; roosts in clusters of up to thousands of individuals; hibernates in limestone caves of Edwards Plateau and gypsum caves of Panhandle during winter; opportunistic insectivore		
Coues' Rice Rat (*Oryzomys couesi*) - cattail-bulrush marsh with shallower zone of aquatic grasses near the shoreline; shade trees around the shoreline are important features; prefers salt and freshwater, as well as grassy areas near water; breeds April-August		T
Jaguar (*Panthera onca*) (extirpated) - dense chaparral; no reliable TX sightings since 1952	LE	E
Jaguarundi (*Herpailurus yaguarondi*) - thick brushlands, near water favored; six month gestation, young born twice per year in March and August	LE	E
Mexican Long-tongued Bat (*Choeronycteris mexicana*) - deep canyons where uses caves & mine tunnels as day roosts; also found in buildings & often associated with big-eared bats (*Plecotus* spp.); single TX record from Santa Ana NWR		
Ocelot (*Leopardus pardalis*) - dense chaparral thickets; mesquite-thorn scrub and live oak mottes; avoids open areas; breeds and raises young June-November	LE	E
Southern Yellow Bat (*Lasiurus ega*) - associated with trees, such as palm trees (*Sabal mexicana*) in Brownsville, which provide them with daytime roosts; insectivorous; breeding in late winter		T
White-nosed Coati (*Nasua narica*) - woodlands, riparian corridors and canyons; most individuals in Texas probably transients from Mexico; diurnal and crepuscular; very sociable; forages on ground & in trees; omnivorous; may be susceptible to hunting, trapping, & pet trade		T
***** MOLLUSKS *****		
Texas Hornshell (*Popenaias popeii*) - Rio Grande drainage from the Pecos River to the Falcon Breaks	C1	
***** REPTILES *****		
Reticulate Collared Lizard (*Crotaphytus reticulatus*) - requires open brush-grasslands; thorn-scrub vegetation, usually on well-drained rolling terrain of shallow gravel, caliche, or sandy soils; often on scattered flat rocks below escarpments or isolated rock outcrops among scattered clumps of prickly pear and mesquite		T
Black Striped Snake (*Coniophanes imperialis*) – extreme south Texas; semi-arid coastal plain, warm, moist micro-habitats and sandy soils; proficient burrower; eggs laid April-June		T
Indigo Snake (*Drymarchon corais*) - thornbush-chaparral woodlands of south Texas, in particular dense riparian corridors; can do well in suburban and irrigated croplands if not molested or indirectly poisoned; requires moist microhabitats, such as rodent burrows, for shelter		T
Keeled Earless Lizard (*Holbrookia propinqua*) – coastal dunes, barrier islands, and other sandy areas; eats insects and likely other small invertebrates; lays clutches of 2-7 eggs March-September (most May-August) in soil/underground		

	Federal Status	State Status
Northern Cat-eyed Snake (*Leptodeira septentrionalis septentrionalis*) - Gulf Coastal Plain south of the Nueces River; thorn brush woodland; dense thickets bordering ponds and streams; semi-arboreal; nocturnal		T
Speckled Racer (*Drymobius margaritiferus*) - extreme south Texas; dense thickets near water, Texas palm groves, riparian woodlands; often in areas with much vegetation litter on ground; breeds April-August		T
Texas Horned Lizard (*Phrynosoma cornutum*) – open arid or semi-arid regions with sparse vegetation; grass, cactus, scattered brush or scrubby trees; burrows into soil, uses rodent burrows, or hides under surface cover		T
Texas Tortoise (*Gopherus berlandieri*) - open scrub woods, arid brush, lomas, grass-cactus association; open brush with grass understory preferred; shallow depressions at base of bush or cactus or underground burrow or hides under surface cover		T

*** VASCULAR PLANTS ***

Bailey's ballmoss (*Tillandsia baileyi*) - epiphytic on various trees and shrubs; flowering February-May		
Chihuahua balloon-vine (*Cardiospermum dissectum*) - shrublands on gravelly soils along Lower Rio Grande Valley; flowering July-September		
Falfurrias milkvine (*Matelea radiata*) - endemic; known only from one collection from Falfurrias; habitat unknown; flowering (May?) June		
Gregg's wild-buckwheat (*Eriogonum greggii*) – grasslands and brushlands on gypsum-capped hills; flowering in summer?		
Mexican mud-plantain (*Heteranthera mexicana*) – aquatic; ditches and ponds; flowering June-August		
Runyon's cory cactus (*Coryphantha macromeris* var. *runyonii*) - endemic; low hills and flats on gravelly soils in Tamaulipan shrub communities along the Rio Grande		
Runyon's water-willow (*Justicia runyonii*) - calcareous silt loam, silty clay, or clay in openings in subtropical woodlands on active or former floodplains; flowering (July-) September-November		
St. Joseph's staff (*Manfreda longiflora*) - endemic; various soils (clays and loams with various concentrations of salt, caliche, sand, and gravel) in openings or amongst shrubs in thorny shrublands; on Catahoula and Frio formations, and also on Rio Grande floodplain alluvial deposits; flowering in September		
Star cactus (*Astrophytum asterias*) - gravelly saline clays or loams over Catahoula & Frio formations, on gentle slopes & flats in grasslands or shrublands; flowering in May	LE	E
Texas ayenia (*Ayenia limitaris*) - woodlands on alluvial deposits on floodplains and terraces along the Rio Grande; flowering throughout the year with sufficient rainfall	LE	E
Vasey's adelia (*Adelia vaseyi*) - subtropical woodlands in Lower Rio Grande Valley; flowering January-June		
Walker's manioc (*Manihot walkerae*) - periphery of native brush in sandy loam; also on caliche cuestas?; flowering April-September (following rains?)	LE	E

	Federal Status	State Status

Status Key:

LE, LT	Federally Listed Endangered/Threatened
PE, PT	Federally Proposed Endangered/Threatened
E/SA, T/SA	Federally Listed Endangered/Threatened by Similarity of Appearance
C1	Federal Candidate for Listing, Category 1; information supports proposing to list as endangered/threatened
DL, PDL	Federally Delisted/Proposed for Delisting
NL	Not Federally Listed
E, T	State Listed Endangered/Threatened
"blank"	Rare, but with no regulatory listing status

Species appearing on these lists do not all share the same probability of occurrence. Some species are migrants or wintering residents only, or may be historic or considered extirpated.

Texas Parks and Wildlife Department Suggested Guidelines for Preparation of Environmental Assessment Documents

Following is an outline of categories of information needed to evaluate a proposed project or action. Every effort should be made to supply quantified data. If subjective data is all that can be supplied, documentation verifying the credentials of the data collector should be provided.

Categories considered essential for adequate biological review by this agency are noted by an asterisk (*). Depending on the complexity and scope of the proposed project or action, or requirements by other agencies, all the items listed below may be required.

Whenever practical, environmental documents should be supported by aerial photography, topographic maps, schematics, charts, tables, etc. with minimum narrative sufficient to describe, quantify, and qualify the data.

A. Project Description

* • Identify who is proposing the project.
* • Identify who is conducting the assessments and provide credentials of this person(s).
* • Describe the purpose of the project.
* • Define the scope of work.
* • Identify the project area and study area (total acres, miles of r-o-w, etc.)
* • Identify the time table projected for the entire project.
* • Describe any required coordination and review for the project.
* • List or describe any required public input.
  • Provide historical information significant to the project.

B. Description of the Affected Environment

1. Natural Resources

  • Describe the geology within the study area.
* • Describe the soils present and their characteristics.
* • Describe the landform (topography) and the natural processes impacting the present landform.
  • Describe the climatic factors affecting the study area.
* • Describe the supply and quality of surface water resources in the study area.
* • Describe the supply and quality of groundwater resources including aquifer recharge zones occurring within the study area.
* • Describe natural hazards affecting the study area, i.e. tidal influences, flood activity, etc.).
  • Describe the quality of the air in the study area.
* • Describe the vegetation communities (cover type) specifically impacted by the project to include: dominant plant species, estimated height of trees, woody

shrubs or brush; and estimated canopy coverage of woody vegetation. Total acreage of each cover type disturbed by the project should also be listed.

* • Describe the fauna that would be associated with the dominant vegetation cover types identified above.
* • Identify "sensitive" ecosystems which occur in the study area such as: springs, streams, rivers, floodplains, vegetation corridors, bottomland hardwoods, wetlands, bays, estuaries, native grasslands, etc.
* • Describe the occurrence of threatened/endangered species (or their habitats) and unique or rare natural communities which occur in the study area.
    a. On site inspection of the study area for permanent or seasonal occurrence.
    b. On site inspection of the study area for occurrence of habitat.
    c. Interviews with recognized experts on all species with a potential of occurrence.
    d. Literature review of data applicable to a potential occurring species concerning species distribution, habitat needs, and biological requirements.

2. Cultural Resources

* • Identify public use and open space areas in the vicinity of the proposed project such as parks, natural areas, wildlife preserves and management areas.
  • Identify previous, present, and proposed land uses within the study area.
  • Identify significant archeological features within the study area.
  • Identify significant historical features in the study area with special consideration of "National Register of Historic Places" properties.
  • Identify rights-of-ways, easements, public utilities, and transportation features within the study area.
  • Identify noise pollution sources and current noise levels within the study area.
  • Identify existing and proposed public health and hazardous waste facilities which exist in the study area such as land fills, hazardous waste sites, wastewater treatment facilities, septic tanks, etc.
  • Identify socioeconomic factors, if applicable.

***C. Project Alternatives**

List and describe project alternatives (including "no action") and associated impacts (direct and indirect) to described resources. If the project is potentially large in scope, cumulative effects with other similar projects may be required.

***D. Mitigation**

A major responsibility of TPWD is to conserve and protect the state's fish, wildlife, and plant resources. Certain categories of these biotic resources warrant special consideration. These include habitats that are locally and regionally scarce, habitats supporting unique species or communities, stream and river ecosystems, bays, estuaries, wetlands, bottomland hardwoods, and native grasslands. All projects which could adversely affect these resources should be fully evaluated, and where possible, implementation of less damaging alternatives undertaken. If it is determined that a project or action will potentially affect fish, wildlife or plant resources, a process for adverse impact reduction should be initiated. Mitigation measures should be developed and implemented sequentially as follows:

1. **AVOIDANCE:** Avoiding adverse impacts through changes in project location, design, operation, or maintenance procedures, or through selection of other less damaging alternatives to the project or action.

2. **MINIMIZATION:** Minimizing impacts and by project modification or rectification to restore or improve impacted habitat to pre-project condition; or through reducing the impacts over time by preservation and maintenance operations during the life of the project or action.

3. **COMPENSATION:** Compensating for unavoidable impacts by providing replacement or substitute resources (including appropriate management) for losses caused by project construction, operation, or maintenance.

Mitigation should be an integral part of any action or project which adversely affects fish, wildlife, and habitats upon which they depend. Failure to adequately avoid or minimize adverse impacts or to adequately compensate for unavoidable losses of natural resources is a serious deficiency in any project plan and may cause delays in this Department's review and assessment of the adverse impacts upon fish & wildlife resources. In assessing project impacts, reasonable foreseeable secondary and cumulative impacts should be included.

***E. Coordination**

Provide copies of pertinent coordination correspondence.

***F. Document Preparers and Their Qualifications**

***G. Bibliography**

(references: 40 CFR Parts 1500-1508 and various EPA handouts concerning Environmental Assessment documentation.)

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 17, 2005

Ms. Sylvia Waggoner
United States Section,
International Boundary and Water Commission
325 Golf Course Rd.
Mercedes, Texas 78570

Consultation No. 2-11-05-T-0230

Dear Ms. Waggoner:

This responds to your letter received April 14, 2005, regarding the effects of raising the Hidalgo Protective Levee on species federally-listed or proposed for listing as threatened or endangered occurring in Hidalgo County, Texas. In addition, your project was evaluated with respect to wetlands and other important fish and wildlife resources.

It is our understanding that the United States Section, International Boundary and Water Commission (USIBWC) is preparing an Environmental Assessment (EA) for a proposed action to raise the Hidalgo Protective Levee System. This 4.5-mile segment of the Lower Rio Grande Flood Control Project (LRGFCP) that runs along the west and south boundaries of the City of Hidalgo in South Texas was recently identified as one of the priority areas to improve flood containment.

The need for improvements to the Hidalgo Protective Levee System was determined by hydraulic modeling completed by the USIBWC: *Hydraulic Model of the Rio Grande and Floodways Within the LRGFCP, June 2003.* The study updated findings of a prior 1992 study by incorporating new structures and geometrical data, as well as changes due to land use and agriculture practices, and increased reliability of the hydraulic model with enhanced software capabilities. In addition to the flood containment evaluation, an assessment of the levee system structural integrity was conducted for the USIBWC in October 2003 [*Condition Assessment of the USIBWC, Lower Rio Grande Levees, South Texas. U.S. Army Corps of Engineers, Engineer Research and Development* Center]. No structural deficiencies were identified for the Hidalgo Protective System.

For the 4.5-mile Hidalgo Protective Levee System, the USIBWC hydraulic study indicated that an increase from 3 to 8 feet of the levee height would be required to meet design criteria for flood control protection and expanding the levee footprint by lateral extension of the structure. The criteria require a levee freeboard of 3 feet above anticipated water level during the design flood event. Levee footprint increases in the riverside would extend into floodplain areas designated by the United States Fish and Wildlife Service (Service) as part of the Lower Rio Grande National Wildlife Refuge (NWR). Footprint increases toward the

levee landside could extend beyond the USIBWC right-of-way. To improve flood control in an approximately 1-mile reach east of the Hidalgo-Reynosa International Bridge, the use of floodwalls and bin-type walls is under consideration, as well as partially rerouting the levee system around the intake channel of the Old Hidalgo Historic Pump House.

The following alternatives are under consideration to improve the Hidalgo Protective Levee System:

1. No Action Alternative: the existing Hidalgo Protective Levee System would be retained in its current configuration.

2. Footprint Expansion Alternative: in-place height increase of existing levee with associated footprint expansion. Placement of floodwalls would be required for existing retaining-wall segments along the international bridge and historic pumphouse.

3. Partial Crown Height Increase Alternative: partial modification of the Footprint expansion Alternative along the downstream segment of the levee. In a 1-mile segment from mile 3.5 through 4.5, a bin-type wall would be constructed along the existing levee crown to improve flood containment without footprint increase.

4. Partial Levee Rerouting: partial modification of the Footprint Expansion Alternative to eliminate the need for floodwall construction in front of the historic pumphouse. A new levee segment, approximately 0.7 miles in length, would be built along the south margin of the pumphouse intake channel, and the channel would be crossed to tie the new structure to the existing levee system.

At least, two sites were used in the early 70's as material borrow sites for levee construction. Those two sites are now part of the Pate Bend Track of the NWR . The larger site, approximately 30 acres, is located just south of the McAllen Pump Station, between levee miles 1.7 to 2.3 (Borrow Site#1). Borrow Site#2, about 5 acres in size, is located west of the international border station, between levee miles 3.0 to 3.2. The USIBWC retained easements on those sites for future use. Use of those borrow sites is under consideration for the levee improvement project. In the selection of alternatives, the USIBWC should closely coordinate with the NWR concerning potential borrow site use, or utilization of alternate locations.

If native vegetation will be impacted, the Service recommends plant surveys to be conducted by a qualified botanist for the three endangered species that occur along the proposed ROW's and selected borrow sites. A report of the plant survey with the results should be includes in the EA for our review. Former borrow site #1 has dense habitat that is suitable for use by ocelots/jaguarundi. The Service recommends that USIBWC further coordinate with the NWR to look at alternate borrow sites to replace borrow site #1.

The following list provides current information on federally listed species for the above county where your future project will occur. The list may include endangered and threatened species, as well as proposed species, candidate species, and species of concern. Proposed species are candidate species for which rules have been published in the Federal Register, nominating the species for threatened or endangered status. Candidate species have no protection under the Endangered Species Act of 1973; however, the Service has substantial information on candidate species to support their listing as threatened or endangered. The development and publication of proposed rules for listing candidate species are anticipated. Therefore, actions that might contribute to the listing of candidate species should be avoided. A letter designation follows the species name that represents the current federal status of the species. Within the list, the letters E, T, P, C, and SOC, represents the status of Endangered, Threatened, Proposed, Candidate, and Species of Concern, respectively. The acronym CH, indicates that there is Critical Habitat associated with the species, and P (CH) indicates that Critical Habitat has been Proposed for the species.

Hidalgo County

ocelot (Felis pardalis) - E
jaguarundi (Felis Yagouaroundi) - E
Northern aplomado falcon (Falco femoralis septentrionalis) - E
Star cactus (Astrophytum asterias) - E
Texas ayenia (Ayenia limitaris) - E
Walker's manioc (Manihot walkerae) - E
Mountain plover (Charadrius montanus) - P/T
Audubon's oriole (Icterus graduacauda audubonii) - SOC
Brownsville common yellowthroat (Geothlypis trichas insperata) - SOC
Ferruginous hawk (Buteo regalis) - SOC
Loggerhead shrike (Lanius ludovicianus) - SOC
Northern gray hawk (Buteo nitidus maximus) - SOC
Sennett's hooded oriole (Icterus cucullatus sennetti) - SOC
Texas Botteri's sparrow (Aimophila botterii texana) - SOC
Texas olive sparrow (Arremonops rufivirgatus rufivigatus) - SOC
Tropical parula (Parula pitiayumi nigrilora) - SOC
White-faced ibis (Plegadis chichi) - SOC
Coues' rice rat (Oryzomys couesi aquaticus) - SOC
Reticulate collared lizard (Crotaphytus reticulatus) - SOC
Texas horned lizard (Phrynosoma cornutum) - SOC
Black-spotted newt (Notophthalmus meridionalis) - SOC
Rio Grande lesser siren (Siren intermedia texana) - SOC
Bailey's ballmoss (Tillandsia baileyi) - SOC
Falfurrias (milkvine) anglepod (Matelea radiata) - SOC
Runyon huaco (Manfreda longiflora) - SOC
Runyon's water-willow (Justicia runyonii) - SOC
Small papillosus (Echinocereus var. angusticeps) - SOC
Texas windmill-grass (Chloris texensis) - SOC
Subtropical blue-black tiger beetle (Cicindela nigrocoerula subtropica) - SOC
Maculated manfreda skipper (Stallingsia maculosus) - SOC

This letter is for general information only and does not constitute a review and clearance of potential effects to federally listed species resulting from any specific project or activity. Upon completion of the biological surveys and EA, the Service can then consult with your agency on the environmental impacts of the selected area. We appreciate the opportunity to provide pre-project 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
Jeff Rupert, Manager, Lower Rio Grande Valley National Wildlife Refuge, Alamo, TX

RECD JUN 2 2005

June 14, 2005

Ms. Sylvia Waggoner
United States Section,
International Boundary and Water Commission
325 Golf Course Road
Mercedes, Texas 78570

Dear Ms. Waggoner,

This letter is intended to follow up on the discussions and other communications the City of Hidalgo has had with the IBWC and other interested agencies on the plans to raise the level of the flood retention levee along the Rio Grande as it borders the city. It makes specific reference to that portion of the levee project immediately adjacent to the Old Hidalgo Pumphouse Museum, and the alternative possibilities for the location of the improved levee as proposed to the City.

At the outset I would like to say that the City of Hidalgo and its citizens appreciate the efforts of the IBWC to further enhance the flood protection for the city afforded by the river levees. These improvements will give us all a greater sense of security and safety, and you have our thanks.

At the same time, as you know, we do have concerns about the integrity of an important local architectural treasure, The Old Hidalgo Pumphouse, and the possible adverse effect the levee project might have on it unless the project is carried out with caution and sensitivity. We are grateful that you recognize and share these concerns.

At its regular meeting of May 10, 2005 the Hidalgo City Council acted to approve the city staff's recommendation in support of Option B for routing the levee construction, that is, along the north bank of the Pumphouse channel, crossing roughly midway between the Pumphouse and the river to the south bank, and continuing along the south bank of the channel to meet the existing levee at a point east of the Pumphouse. A copy of that action is enclosed, along with several informal recommendations and considerations from the city staff.

We are pleased to be working with you on this project, and we are looking forward to its successful execution to the benefit of all concerned.

Sincerely yours,

John David Franz, Mayor, City of Hidalgo

Attachments: City Council Action of May 10, 2005; staff recommendations
cc: Steve Smollens; Bernardino Olague, P.E.

HIDALGO
All-America City
2004

704 East Texano Drive Hidalgo, Texas 78557 (956) 843-2286 Fax: (956) 843-2317

Agenda Item 2. Consideration and possible action on proposed IBWC Plans for raising the flood retention levee in the area of the Old Hidalgo Pumphouse/Chuck Snyder/Joe Vera III.

Mayor Franz said this agenda item was on proposed IBWC Plans for raising the flood retention levee in the area of the Old Hidalgo Pumphouse. Mayor Franz called Pumphouse Director, Mr. Chuck Snyder to the podium. Mr. Snyder illustrated on the plat, the two options for the levee revision. Further, the original option had called for a six to eight foot wall between the channel and the Pumphouse building. Option B, called for raising the levee on the north side of the channel to a point approximately half way between the River and the Pumphouse and crossed the channel to the south bank (control gates located there) and would continue along the south bank to the current location of the levee. Mr. Snyder and Mr. Vera recommended Option B. After further discussion, Mayor Franz entertained a motion to approve Option B, as presented. Councilmember Siglinde Franz so moved and Councilmember Pedro Fonseca seconded it. Motion carried unanimously.

From the Minutes of the Hidalgo City Council meeting of May 10, 2005.

Recommendations for the IBWC Levee Project in Hidalgo

1. Adopt Option B, crossing the channel midway between the river and the Pumphouse, and continuing with the levee on the south bank of the channel.
2. Install gates in the levee wall as it crosses the channel, for circulation and to protect the pump pits in the building when the river level is high, but not necessarily at flood stage.
3. With the agreement and permission of the USFWS, obtain fill from a new borrow site in the grasslands of the Hidalgo Bend Tract refuge for the levee on the south bank of the channel. This will serve to both provide fill, and to assist in the creation of wetlands, or a marshy area in this portion of the refuge as an adjunct to the World Birding Center project.

Further considerations in the levee relocation:

1. Install an aeration fountain in the center of the east reach of the channel, both for aesthetics and for utility
2. Install an observation deck immediately southwest of the building as originally planned
3. Include an ADA ramp during the levee construction, east of the building, thus giving access to the refuge walking trail
4. Where will the biking trail be located, that was originally anticipated for the top of the levee along the channel and north of the refuge
5. Another ADA ramp is needed at the east end of the walking trail to give access to the levee
6. Consider eventually a park area on the river to the south of the channel outlet, and determine access.

TEXAS HISTORICAL COMMISSION

The State Agency for Historic Preservation

RICK PERRY, GOVERNOR

JOHN L. NAU, III, CHAIRMAN

F. LAWERENCE OAKS, EXECUTIVE DIRECTOR

June 20, 2005

Ms. Sylvia Waggoner
United States Section
International Boundary and Water Commission
325 Golf Course Rd.
Mercedes, TX 78570
Fax: (956) 565-1575

Re: ***Project review under Section 106 of the National Historic Preservation Act of 1966***
Hidalgo Protective Levee System, Hidalgo County (106/USIBWC)

Dear Ms. Waggoner,

Thank you for your correspondence describing the above referenced project. This letter serves as comment on the proposed undertaking from the State Historic Preservation Officer (SHPO), the Executive Director of the Texas Historical Commission (THC).

Four alternatives for the Hidalgo Protective Levee System were introduced to the THC in documentation provided by PARSONS (March 2005, Page 3, Preliminary Description of Alternatives for Improved Flood Control.) PARSONS provided additional information while presenting the alternatives to THC staff on May 24, 2005.

The THC review staff believes that any change to the character defining features of this historic resource would result in an adverse effect determination; however, as discussed in our meeting, a Memorandum of Agreement (MOA) would define the terms under which the adverse effect could be mitigated, allowing the undertaking to proceed as specified.

The following alternatives were provided:

1. No Action Alternative
2. Footprint Expansion Alternative
3. Partial Crown Height Increase Alternative
4. Partial Levee Rerouting

The approach that would address goals of the IWBC and that would have the least impact on the historic resources appears to be a combination of alternatives 2 and 4: levee footprint expansion with a new segment crossing the existing intake channel. This approach would eliminate the need for floodwall construction along the historic pump house, which would obscure the south elevation of the building and dramatically change the setting of the historic resource, as well as, the view from the property.

The levee rerouting approach included two options for the location of the intake channel crossing. The THC prefers Option A because it provides the greatest distance between the historic pump house and the new levee construction. However, Option B, being located mid-channel, is acceptable to the City of Hidalgo and preferred by IBWC with regard to providing more efficient circulation at the mouth of the intake channel. This being the case, the THC is willing to agree to Option B even though Option A would be a more sensitive approach by preservation standards.

Along with a description of the scope of work, it may also be prudent to incorporate additional comments into the MOA to direct future construction on and around the levee, as well as recommendations for mitigation agreed upon by all signatories. Bulleted items below are examples of additional issues the MOA would specify for this particular undertaking.

- No new construction on the crown and footprint of the levee
- Maintenance conditions for the levee and adjacent property
- Restitution to the pump house museum if existing interpretive material for the levee is compromised by new configurations
- Archeological survey of impact areas of all new construction, all borrow locations, and any other areas of new impacts not yet identified
- Avoidance or mitigation of any significant archeological deposits discovered during surveys or testing

Please contact the lead reviewer for this project, Amy Hammons, at 512-463-8952. If you have any archeological inquiries, please contact secondary reviewer Debra Beene (512.463.5865). We look forward to further consultation on this project with your agency. Thank you for your cooperation in this federal review process.

Yours truly,

Amy Hammons, Project Reviewer
for: F. Lawerence Oaks, State Historic Preservation Officer

cc: Rick DeJulio, Hidalgo County Historical Commission
Carlos Victoria, PARSONS

APPENDIX B
DRAFT EA COMMENTS

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August 10, 2005

Mr. Daniel Borunda, Environmental Protection Specialist
United States Section, International Boundary and Water Commission
4171 N. Mesa, Suite C-100
El Paso, Texas 79902

Dear Mr. Borunda,

We would like to express our appreciation for the opportunity to comment on the results of the Draft Environmental Assessment covering the Hidalgo Protective Levee System. This has been a matter of a great deal of discussion locally, especially as it relates to the potential impact on the Old Hidalgo Pumphouse Museum and Channel.

The City of Hidalgo has gone on record as being in support of the Option B alternative for the raising of the levee level along the old Pumphouse channel. That recommendation still obtains and, from a reading of the draft assessment, the factors involved appear to favor that alternative as having the least negative impact on the historical Pumphouse and its site. It should be noted that the Pumphouse and the channel and irrigation system under the jurisdiction of the Hidalgo County Irrigation District #2 and the City of Hidalgo are all actually listed on the National Register of Historic Places, and thus under the jurisdiction of the SHPO. The EA in several places mentions "the Hidalgo Historic Pumphouse, a resource eligible for inclusion in the National Register of Historic Places." (Emphasis added.)

Your attention is directed to Page 6 of the draft, under *Indirect Impacts*, where it is mentioned that the floodwall, if constructed, would obstruct direct access between the Hidalgo Pumphouse and TPWD World Birding Center, and the trail system along the channel. This same obstruction would be present for the parts of the trail system through the US Fish and Wildlife Service Hidalgo Bend Tract of the National Wildlife Corridor, immediately adjacent to the Pumphouse site. This hiking trail is a part of a TEA21 project being carried out throughout the City of Hidalgo, and is under construction.

Again, we thank you for this opportunity, and would be ready at any time to discuss the matter further.

Sincerely yours,

Chuck Snyder, Director
Old Hidalgo Pumphouse

HIDALGO
All-America City
2004

TEXAS HISTORICAL COMMISSION

The State Agency for Historic Preservation

RICK PERRY, GOVERNOR

JOHN L. NAU, III, CHAIRMAN

F. LAWERENCE OAKS, EXECUTIVE DIRECTOR

August 3, 2005

Ms. Sylvia Waggoner
United States Section
International Boundary and Water Commission
325 Golf Course Rd.
Mercedes, TX 78570

Re: ***Project review under Section 106 of the National Historic Preservation Act of 1966***
Hidalgo Protective Levee System, Hidalgo County (106/USIBWC)

Dear Ms. Waggoner,

Thank you for submitting a Draft Environmental Assessment (d-EA) describing the above referenced project. This letter serves as comment on the proposed undertaking from the State Historic Preservation Officer (SHPO), the Executive Director of the Texas Historical Commission (THC).

No cover letter accompanied the d-EA but our review staff assumes that you would like additional comments from our review of the document. Much of the information is similar to what has been presented to our office earlier this year. We appreciate that your project team has included our agency in early consultation for the project and included our general recommendations in your assessment.

Our review staff has marked several pages noting clarifications that may be helpful to your project team. Along with those attached pages are the following bulleted comments from our Archeology Division:

- author needs to incorporate data related to the probability for prehistoric cultural deposits into sections 3.2 and 4.2. The two HPAs identified are areas containing a high probability for historic structural remnants; prehistoric probabilities are lacking.

- conflicting statements in 3.2.1 and 5.2.1 with regard to prehistoric site preservation in areas exposed to rapidly deposited soil.

- the archeological sections within this document should include the THC recommendations as written in Appendix A: the need for archeological survey of impact areas of all new construction [including the southern side of the intake channel], all borrow locations and any other areas of new impacts not yet identified.

Please contact the lead reviewer for this project, Amy Hammons, at 512-463-8952. If you have any archeological inquiries, please contact secondary reviewer Debra Beene (512.463.5865). We look forward to further consultation on this project with your agency. Thank you for your cooperation in this federal review process.

Yours truly,

Amy Hammons, Project Reviewer
for: F. Lawerence Oaks, State Historic Preservation Officer

cc: Rick DeJulio, Hidalgo County Historical Commission
Carlos Victoria, PARSONS

3.2 CULTURAL RESOURCES

3.2.1 Archaeological Resources

The upper soil strata are modern in this area along the Rio Grande, the upper 10 feet generally being no more than a few hundred years old, although this is not consistent. In some areas, the upper soil can be up to several thousand years old (Cooper, *et al.* 2002). The proposed project lies within the Los Caminos del Rio Heritage Project corridor, an area of regional, national, and international significance (Sánchez 1994). Archaeological sites sealed under rapidly deposited soil could retain a high degree of integrity and provide important understanding of the history of Caminos del Rio corridor.

Previous research has been conducted to determine the potential for archaeological sites along the LRGFCP (Cooper, *et al.* 2002). Areas noted by Cooper, *et al.* (2002) to have a high potential for archaeological resources (designated high probability areas [HPA]) within the levee corridor include the following, shown in Figure 3.2.

These are HPAs for historic resources & doesn't apply to prehistoric

- HPA-1, an area where structures are denoted on a 1916 map—Cooper, et al. (2002) identifies this as 16HI2.
- HPA-2, an area where numerous structures are denoted on a 1916 map - Cooper, et al. (2002) identifies this as 16HI4.

In Sect. 3.2 → please add INFO & probability for prehistoric cultural resources

A review of the Texas Archeological Sites Atlas identified no previously identified archaeological sites in the Hidalgo Protective Levee System, either along the levee corridor or within a half mile of the existing levee. because the area hasn't been investigated

3.2.2 Architectural and Engineering Resources

Spanish colonization of the area began in 1749, when tracts known as *porciones* were allotted to settlers who typically undertook ranching, small scale agriculture, and subsistence farming (Weitze, 1992). After the end of the Mexican War in 1848, land acquisition from the original grantee descendents began and the land was consolidated into larger parcels. Some of the first settlements and small towns on the north side of the Rio Grande in Hidalgo County were established during this post-war period, but land use in general continued to focus on ranching. Land in the region was described as "...an arid wasteland of mesquite and brush useful only for grazing livestock by the scattered ranch families who made their living on the land." (Weitze, 1992).

Near the end of the 19th century, Anglo settlers began experimenting with agriculture and irrigation in the valley, and the new arrivals often had ambitions of large-scale development. "They financed rail transportation, built the first mechanized irrigation pumping stations and canals, platted townsites, and promoted their lands in an effort to develop the agricultural potential of the valley. They laid the groundwork for the 40-acre farms that sprang up in the first half of the 20th century." (Weitze, 1992). In 1893, William Chatfield visited Hidalgo and noted it was the only town worth mention between Rio Grande City and Brownsville (Weitze, 1992).

	Common Name	Association with Project Area Habitat	Potential Effect
	Interior least tern	Nests along sand and gravel bars with braided streams, rivers, inland channels, and some lakes.	Not-likely to affect – Timing of construction activities to avoid breeding season (April – June)
	Rose-throated becard.	Riparian corridors and mesquite thickets, open forest, and mangroves; breeds April – July.	Not-likely to affect
	Tropical parula	Dense woodlands or parklands, riparian corridors, shrublands with dense underbrush. Breeds April – July.	Not-likely to affect
MAMMAL SPECIES	Ocelot	Woodland communities along flood-side of levee and within woodland communities in borrow sites.	Not-likely to affect
	Gulf Coast jaguarondi	Woodland communities along flood-side of levee and within woodland communities in borrow sites..	Not-likely to affect
	Southern yellow bat	Potential for incidental use as foraging areas.	Not-likely to affect
	Coues' rice rat	Willow-phragmites riparian areas along intake canal connecting the Hidalgo Pumphouse with the Rio Grande.	Not-likely to affect – Timing of construction activities to avoid breeding season (April – June)

4.2 CULTURAL RESOURCES

4.2.1 Archaeological Resources

Phase 1 No Action Alternative. No impacts are anticipated as the current levee configuration would be retained.

Phase 1 Footprint Expansion Alternative. Improvements to the levee system have a low potential to impact archaeological resources. Previous investigations by Cooper, *et al.* found that ground disturbance extending no more than 6 feet in depth "...would not likely impact significant archeological deposits...." (Cooper, *et al.* 2002). Ground disturbing activities related to the proposed levee improvements of the Phase 1 Footprint Expansion Alternative are not expected to extend to 6 feet. Need to add info. related to prehistoric cultural resources in Section 3.2 & 4.2

One area where archaeological materials may remain in the upper 6 feet of soil is near the McAllen Pump House. Cooper, *et al.* (2002) identified a high probability area for historic-era archaeological sites at this location. The 1916 United States Geological Survey topographic map indicates structures were standing in this vicinity at that time. No standing structures now exist at the location, but historic-era archaeological materials may remain. There is a low likelihood that any of these remains would be significant.

Excavation of soil from the two designated borrow areas may involve deeper disturbance than levee construction, increasing the possibility of impacting archaeological remains. Excavation in these areas, where soil disturbance will be extensive and possibly deep, has a moderate to high potential to disturb significant archaeological resources. If 20th century soil disturbance by natural or artificial means

5.2 CULTURAL RESOURCES

5.2.1 Archaeological Resources

Phase 2 No Action Alternative

The Phase 2 No Action Alternative would not impact archaeological resources. Current levee configuration would be retained.

Phase 2 Footprint Expansion Alternative

The proposed levee improvement project under the Phase 2 Footprint Expansion Alternative would have a low potential to impact archaeological resources. Previous investigations by Cooper, *et al.* found that ground disturbance extending no more than 6 feet in depth "...would not likely impact significant archeological deposits...." (Cooper, *et al.* 2002). Ground-disturbing activities related to the levee modifications of the Phase 2 Footprint Expansion Alternative would not be expected to extend to 6 feet.

One area where archaeological materials may remain in the upper 6 feet of soil extends from approximately levee mile 3.7 to mile 4.3. Cooper, *et al.* (2002) identified a high probability area for historic-era archaeological sites at this location. The 1916 United States Geological Survey topographic map indicates structures were standing in this vicinity at that time. Historic-era archaeological materials may remain. There is a low likelihood that any of these remains would be significant.

The excavation of soil from the two designated borrow areas for the Phase 2 Footprint Expansion Alternative may involve deeper disturbance than levee construction, increasing the possibility of impacting archaeological remains. Excavation in these areas, where soil disturbance will be extensive and possibly deep, has a moderate to high potential to disturb significant archaeological resources. If 20th century soil disturbance by natural or artificial means indicates materials that remain in these areas or portions of these areas retain little or questionable contextual integrity, the potential for existence of significant archaeological artifacts in the disturbed portions of the borrow areas would be negligible.

No-Footprint Expansion Alternative

The Phase 2 No Footprint Expansion Alternative would not impact archaeological resources.

Partial Levee Rerouting Alternative (Phase 2 Proposed Action)

Modifications to the levee under the proposed Phase 2 Partial Levee Rerouting Alternative would have a low potential to impact archaeological resources. Previous investigations by Cooper, *et al.* found that ground disturbance extending no more than 6 feet in depth "...would not likely impact significant archeological deposits...." (Cooper, *et al.* 2002). Ground disturbing activities related to the levee modifications of the Phase 2 Partial Levee Rerouting Alternative are not expected to extend to 6 feet.

One area where archaeological materials may remain in the upper 6 feet of soil is the area along the south side of the Hidalgo Historic Pumphouse intake channel. Cooper, *et al.* (2002) identified a high probability area for historic-era archaeological sites that encompasses this location. According to that source, the 1916 United States Geological Survey topographic map indicates structures were standing in this vicinity at that time. Historic-era archaeological materials may remain. However, there is some indication that the Rio Grande was much nearer to the intake channel until 1930. A major flood episode in the 1930s may have resulted in the shift of the river channel to near its present location and may have scoured the land between the intake channel and the current course of the river. If additional archival research reveals that the course did shift from near the intake channel across the proposed corridor for the Phase 2 Partial Levee Rerouting Alternative, the soil in that area would be unlikely to retain significant archaeological remains. There is a low likelihood that archaeological resources in the corridor of the Phase 2 Partial Levee Rerouting Alternative would be significant.?

The excavation of soil from the two designated borrow areas for the Phase 2 Partial Levee Rerouting Alternative may involve deeper disturbance than levee construction, increasing the possibility of impacting archaeological remains. Excavation in these areas, where soil disturbance will be extensive and possibly deep, has a moderate to high potential to disturb significant archaeological resources. If 20th century soil disturbance by natural or artificial means indicates materials that remain in these areas or portions of these areas retain little or questionable contextual integrity, the potential for existence of significant archaeological artifacts in the disturbed portions of the borrow areas would be negligible.

5.2.2 Historical and Architectural Resources

Phase 2 No Action Alternative

The Phase 2 No Action Alternative will not impact historical or architectural resources. Current levee configuration would be retained.

Phase 2 Footprint Expansion Alternative

The Phase 2 Footprint Expansion Alternative has a moderate potential to physically impact the Hidalgo Historic Pumphouse intake channel, an associated feature of this NRHP-eligible resource. The proposed levee improvements along the north side of the intake channel are expected to take place very close to the intake channel, so there is the possibility that physical impacts would occur. The proposed construction of the floodwall along the southwest side of the Hidalgo Historic Pumphouse also has potential to physically impact the NRHP-eligible resource.

The Phase 2 Footprint Expansion Alternative has a high potential to visually impact the setting and feel of the Hidalgo Historic Pumphouse and associated features such as the intake channel. Both the proposed increase in the height of the levee along the north side of the intake channel and the proposed construction of the floodwall near the pumphouse building would impact the integrity of the resource by altering its setting and the feel of the resource's place in time. This action could be considered to have an

adverse impact to the historical resource. A memorandum of agreement would need to be developed in coordination with the THC to mitigate this adverse impact.

The Phase 2 Footprint Expansion Alternative would not impact four other historical or architectural resources identified in Subsection 3.2.2. None of these resources are close enough to the levee corridor for its integrity of setting or feel to be visually affected.

No-Footprint Expansion Alternative

The Phase 2 No Footprint Expansion Alternative has a moderate potential to physically impact the Hidalgo Historic Pumphouse intake channel, an associated feature of this NRHP-eligible resource. The proposed levee improvement project along the north side of the intake channel is expected to take place very close to the intake channel, so there is the possibility that physical impacts would occur. The proposed construction of the floodwall along the southwest side of the Hidalgo Historic Pumphouse also has potential to physically impact the NRHP-eligible resource.

The Phase 2 No Footprint Expansion Alternative has a high potential to visually impact the setting and feel of the Hidalgo Historic Pumphouse and associated features such as the intake channel. Both the proposed increase in the height of the levee along the north side of the intake channel and the proposed construction of the floodwall near the pumphouse building would impact the integrity of the resource by altering its setting and the feel of the resource's place in time. This action may be considered to have an adverse impact to the historical resource. A memorandum of agreement would need to be developed in coordination with the THC to mitigate this adverse impact.

The Phase 2 No Footprint Expansion Alternative would have no impact on four other historical or architectural resources identified in Subsection 3.2.2 since these resources are not close enough to the levee corridor for their integrity of setting or feeling to be visually affected.

Partial Levee Rerouting Alternative (Phase 2 Proposed Action)

The Phase 2 Partial Levee Rerouting Alternative has a high potential to physically impact the Hidalgo Historic Pumphouse intake channel, an associated feature of this NRHP-eligible resource. The proposed levee improvement project that would construct a levee across the intake channel at either Crossing A or Crossing B location would impact the integrity of design, setting, and feeling of the intake channel and pumphouse. Construction of the levee across the intake channel would alter the historic function of the channel, and would partially obstruct the view along the channel from the pumphouse to the river. Crossing A is preferable to Crossing B as the former would impact the setting of the pumphouse to a lesser extent; however, Crossing B is far enough from the pumphouse that the action would not be regarded as having an adverse impact to the pumphouse setting. Appropriate use of vegetation should be able to minimize the visual impact of the new levee alignment. A Memorandum of Agreement would need to be developed with the THC to implement the alternative in keeping with the no-adverse-effect determination. The Memorandum of Agreement would define the terms under

MOA's are for adverse effects. We have not been provided a no-adverse effect scenario

don't really understand this statement

THC letter dated 6-20-05 noted that my change would likely yield an adverse effect determination

which the adverse effect could be mitigated, and incorporate additional considerations to direct future construction on and around the levee as well as recommendations for mitigation agreed upon by all signatories. Example considerations were provided by the THC in June 20, 2005 correspondence to the USIBWC (included in Appendix A).

The Phase 2 Partial Levee Rerouting Alternative, by eliminating the need for floodwall construction in front of the pumphouse, would retain the current setting and historic landscape of the area surrounding the building. Levee rerouting would also preserve the visual connection between the intake channel and the pumphouse building complex and museum.

The Phase 2 Partial Levee Rerouting Alternative would have no impact on four other historical or architectural resources identified in Subsection 3.2.2 since these resources are not close enough to the levee corridor for their integrity of setting or feel to be visually affected.

5.3 WATER RESOURCES

5.3.1 Flood Control

Phase 2 No Action Alternative

The No Action Alternative would retain the existing configuration of the Hidalgo Protective Levee System, as designed over 30 years ago, and level of flood protection currently associated with this system. Under severe storm events, current containment capacity may be insufficient to fully control Rio Grande flooding with risks to personal safety and property.

Phase 2 Footprint Expansion Alternative

Improvements to the Hidalgo Protective Levee System, following completion of Phases 1 and 2, would increase flood containment capacity in this reach of the LRGFCP to meet design specifications for protection of the City of Hidalgo against the design flood event.

No adverse impacts south of the Rio Grande are anticipated as a result of improving the Hidalgo Protective Levee System. The proposed raising of the Hidalgo Protective Levee System would have a minimum impact on the anticipated flood water elevation along this reach of the LRGFCP as indicated by hydraulic modeling. Results of the HEC-RAS hydraulic model developed for flood simulation along the LRGFCP indicate that water level through the Hidalgo-Reynosa reach would increase by less than 1 inch. This value is not significant as current levee deficiencies typically range from 3 to 8 feet along this reach of the LRGFCP. Modeling results for improvements to the Hidalgo Protective Levee System (Phases 1 and 2 in combination) were previously presented in Table 4.3, and discussed in Subsection 4.3.1.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

July 29, 2005

Mr. Daniel Borunda, Environmental Protection Specialist
United States Section
International Boundary and Water Commission
4171 North Mesa, Suite C-100
El Paso, Texas 79902

Re: Draft Environmental Assessment- Hidalgo Protective Levee System Improvements Alternatives

Dear Mr. Borunda:

The Texas Commission on Environmental Quality (TCEQ) is in receipt of the July 2005 Draft Environmental Assessment (EA) - Alternatives for Improved Flood Control of the Hidalgo Protective Levee System. The United States Section International Boundary and Water Commission (USIBWC) is considering alternatives to raise the 4.5 mile Hidalgo Protective Levee System to meet current flood control requirements. The Draft EA assessed potential environmental impacts of the proposed action, the no action alternative, and two alternatives to the proposed action.

As stated in the Draft EA, the proposed action alternative would be implemented in two phases. Phase 1 would raise existing levee height along the 3.3 mile upstream reach of the levee system. Phase 2 would partially reroute the 1.2 mile downstream reach of the levee system to eliminate the need for construction of a floodwall in front of the Hidalgo Historic Pumphouse. A new levee segment, approximately 0.7 mile in length, would be built along the south margin of the pumphouse intake channel, and the channel would be crossed to tie the new structure to the existing levee system. Phase 1 will not impact wetlands and Phase 2 will impact from 0.5 to 0.7 acres of wetlands. According to the Draft EA, USIBWC will have to apply for a Department of the Army permit under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act for impacts to waters of the United States, including wetlands.

The TCEQ looks forward to working with USIBWC during the permitting process. If you have any questions, please contact Ms. Lori Hamilton of the Water Quality Division MC-150, P.O. Box 13087, Austin, Texas 78711-3087. Ms. Hamilton may also be contacted by e-mail at *lhamilto@tceq.state.tx.us*, or by telephone at (512) 239-0683.

Sincerely,

L'Oreal W. Stepney, Director
Water Quality Division

LWS/LH/ms

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
101 South Main Street
Temple, TX 76501-7602

August 3, 2004

International Boundary and Water Commission
4171 N. Mesa Street, Suite C-100
El Paso, Texas 79902

Attention: Mr. Daniel Borunda, Environmental Protection Specialist

Subject: LNU-Farmland Protection-
Hidalgo Protective Levee System
Hidalgo County, Texas

We have reviewed the information provided concerning the proposed improvements to the Hidalgo Protective Levee System in Hidalgo County, Texas, as outlined in your letter of July 2005. This is part of a Draft Finding of No Significant Impact for this project as required by the International Boundary and Water Commission. We have reviewed the project as required by the Farmland Protection Policy Act (FPPA).

Your plans indicate that you are considering three options. The No build and the Mechanically Stabilized Earth Structure will have no impact on Important Farmland Soils. The Footprint Expansion Option will have little impact from rebuilding the levee. The FPPA law states "Actions that include assistance provided to purchase, maintain, renovate, or replace a structure that already exists in not subject to the act." The main impact will be loss of soil from the borrow area. We have rated the borrow option and completed an AD-1006 form for the borrow area. The Total points in Part VII of the AD-1006 are 110. The FPPA law states that sites with a score less than 160 will need no further consideration. We concur that a Finding of No Significant Impact (FONSI) should be granted.

I have attached a completed AD-1006 (Farmland Conversion Impact Rating) form for this project Thanks for the quality resource materials you submitted to evaluate this project. If you have any questions please call James Greenwade at (254)-742-9960, Fax (254)-742-9859.

Thanks,

James M. Greenwade
Soil Scientist
Soil Survey Section
USDA-NRCS, Temple, Texas

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*		Date Of Land Evaluation Request 7-7-2005	
Name of Project Hidalgo Protective Levee System		Federal Agency Involved International Boundary and Water Commission	
Proposed Land Use Flood Protection		County and State Hidalgo County, Texas	
PART II *(To be completed by NRCS)*		Date Request Received By NRCS 7-11-2005	Person Completing Form: James Greenwade
Does the site contain Prime, Unique, Statewide or Local Important Farmland? *(If no, the FPPA does not apply - do not complete additional parts of this form)*	YES x ☐ NO ☐	Acres Irrigated 185.330	Average Farm Size 463
Major Crop(s) Grain Sorghum	Farmable Land In Govt. Jurisdiction Acres: 639,936 % 63	Amount of Farmland As Defined in FPPA Acres: 521,634 % 52	
Name of Land Evaluation System Used LESA	Name of State or Local Site Assessment System NONE	Date Land Evaluation Returned by NRCS 8-3-2005	

PART III *(To be completed by Federal Agency)*	Alternative Site Rating			
	Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	17			
B. Total Acres To Be Converted Indirectly	0			
C. Total Acres In Site	17			
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland	15			
B. Total Acres Statewide Important or Local Important Farmland	0			
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted	0.0001			
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value	35			
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)	80			

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)*	Maximum Points	Site A	Site B	Site C	Site D
1. Area In Non-urban Use	(15)	15			
2. Perimeter In Non-urban Use	(10)	5			
3. Percent Of Site Being Farmed	(20)	0			
4. Protection Provided By State and Local Government	(20)	0			
5. Distance From Urban Built-up Area	(15)	5			
6. Distance To Urban Support Services	(15)	0			
7. Size Of Present Farm Unit Compared To Average	(10)	0			
8. Creation Of Non-farmable Farmland	(10)	0			
9. Availability Of Farm Support Services	(5)	5			
10. On-Farm Investments	(20)	0			
11. Effects Of Conversion On Farm Support Services	(10)	0			
12. Compatibility With Existing Agricultural Use	(10)	0			
TOTAL SITE ASSESSMENT POINTS	160	30			
PART VII ***(To be completed by Federal Agency)***					
Relative Value Of Farmland *(From Part V)*	100	80			
Total Site Assessment *(From Part VI above or local site assessment)*	160	30			
TOTAL POINTS ***(Total of above 2 lines)***	260	110			

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? YES ☐ NO ☐

Reason For Selection:

Name of Federal agency representative completing this form:	Date: