SECTION 3
AFFECTED ENVIRONMENT

This section describes the resources in the Project Area that form the basis for evaluation of the potential environmental impacts of the Proposed Action and the No Action Alternative. Resource areas described in this section correspond to the range of resource areas addressed in Section 4, "Environmental Consequences."

3.1 IMPORTANT FEATURES OF THE PROJECT AREA

Retamal Diversion Dam is located just south of Weslaco, Texas. The dam is not a daily operational structure and is only operated in the event floodwaters need to be diverted to the Mexican interior floodway. The dam has three flood gates and the center gate is operated manually. The gates are tested once per month to ensure operability. Maintenance personnel from both countries conduct normal maintenance once a week.

The Project Area (Figure 2.1) includes the U.S. portion of a sandbar and vegetated island that extends 1,407 feet from the downstream side of the Retamal Diversion Dam and east to the international boundary (approximately 4 acres in size). Adjacent lands to the Project Area includes USIBWC managed lands west of the sandbar and vegetated island on the river terrace (approximately 7 acres in size) and the USFWS Lower Rio Grande Valley National Wildlife Refuge, La Coma Tract.

USIBWC property adjacent to the Project Area consists mostly of the former dam construction site, which included a temporary water diversion channel (backfilled upon dam completion). Approximately 450 feet downstream of the dam apron, the U.S. river bank is armored with riprap. Beyond the bank armoring, a riparian margin approximately 100 feet wide extends beyond the island.

The wildlife area is a large system of noncontiguous tracts of protected land managed by the USFWS to conserve habitat and wildlife, including endangered plant and animal species. The Texas Parks and Wildlife Departments Las Palomas Wildlife Management Area (WMA) – McManus Unit is less than 1 mile northwest of the dam.

The LRGRCP is comprised of a variety of features that protect life and property in the LRGV against Rio Grande floodwaters. Maintenance programs designed to protect these features include levee maintenance and channel and floodway maintenance.

3.2 WATER RIGHTS

Unlike elsewhere in Texas where water is a flow resource, surface water in the Rio Grande below Amistad is a stock resource meaning that water accumulates in Amistad and Falcon reservoirs and is released on demand. Amistad and Falcon reservoirs are considered one system with water frequently released from the upstream dam (Amistad) to replenish Falcon reservoir and meet the demands in the Lower Rio Grande Valley. The Rio Grande

Watermaster is the authorized agent allowed to request releases of U.S. water held in storage at both reservoirs (Rubenstein 2002).

Water rights and distribution in the Rio Grande are based on two factors: 1) the maximum volume assigned by law to each water right holder, by use; and 2) priority of the use. All water rights have a maximum annual allowable, but because the total legal demand for water always exceeds the supply, only the highest priority uses receive the full amount of their water right. The following are the weighted priorities: 1) domestic municipal and industrial uses (highest priority), 2) operational, and 3) carry over balances for irrigation water accounts. In order to provide for and protect this municipal based priority system the watermaster divides all U.S. waters held in storage at Amistad/Falcon into three distinct pools. The highest priority pool is the water reserved for all municipal uses. It is reestablished monthly to cover roughly 1 years' average municipal diversions (225,000 acre-feet). The second highest priority pool, reestablished monthly, is water held in reserve (75,000 acre-feet) to cover in system losses and ensure conveyance of water even in periods of low flow and drought. The lowest priority pool is reserved for agricultural interests and consists of leftover water after the Municipal and Operating pools have been reestablished. This irrigation water pool consists of leftover irrigation storage that has not been used and new net inflows. This priority-based system also mandates that municipal water be treated differently from irrigation in the allocation process. At the beginning of the calendar year, each municipal water right holder's account is replenished to its full amount. No leftover water is rolled over to the new year. Agricultural accounts on the other hand are replenished only when monthly inflows are in excess of losses and the water needed to reestablish the Municipal and Operating reserves (Rubenstein 2002).

According to the TCEQ Rio Grande Watermaster, there are currently no U.S. water rights available (Rubenstein 2003).

3.3 RIVER HYDROLOGY

3.3.1 Water Regimes

The flow of the Rio Grande is highly variable and tightly managed. In the Project Area and surrounding areas, flow is dictated by the needs of agriculture and crop watering schedules. September to February is the period with the lowest flow in the Project Area.

The other major items that impact flow in the Rio Grande are water storage and storms. There are two large reservoirs on the lower Rio Grande, International Amistad Reservoir, near Del Rio, TX and International Falcon Reservoir, near Laredo, TX. These reservoirs store water for public water supply, recreational activities as well as holding stormwater surges. There are approximately 500 irrigation and drainage structures that regulate flow and 270 miles of levees to manage stormwater and channel flow into and out of diversions and floodways.

Low water flow conditions characterize the river with little potential for improvement. 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, have contributed to severely reduced flows. Water within the Rio Grande is currently fully allocated with agricultural use constituting 82 to 90 percent of the water in the LRGV (USIBWC 2002).

Over the past 6 years, noxious aquatic plants, primarily hydrilla (*Hydrilla verticillata*) and waterhyacinth (*Eichornia crassipes*) have seriously impacted the LRGV and Project Area. In 1998, weed infestation was cited as the worst on record in the LRGV. The effect of aquatic vegetation includes restricted water delivery, inaccurate water accounting, and water loss through evapotranspiration. The Texas Watermaster and LRGV District Managers Association reported that infestations of aquatic vegetation were the main contributors to excessive water loss (Grodowitz *et al.* 2001).

River elevation is influenced by upstream dams and fluctuates due to irrigation deliveries, withdrawals, and flood events. A number of variables influence river elevation such as flow rates, aquatic vegetation, channel configurations (*e.g*. the island). Calculated average river elevations downstream of Retamal Dam is presented in Table 3.3-1 (USIBWC 2003b).

Table 3.3-1 Average Flow and Calculated River Elevations

Years 1990-2003	Average Flow (cfs)	River Elevation (ft) Calculated Using HEC-RAS
January	1,088	60.32
February	1,232	60.73
March	1,298	60.92
April	2,179	61.71
May	2,486	62.01
June	2,635	62.15
July	1,695	61.19
August	1,526	61.00
September	798	60.23
October	752	60.01
November	586	59.83
December	615	59.97

3.3.2 Sedimentation

The Rio Grande flows though an arid region with soils composed primarily of sand. Results of sediment samples taken at the Project Area show that they are composed of 66.5 percent sand, 21.9 percent silt, and the remaining 11.6 percent clay. These types of sediments are highly transportable by stormwater and even normal flow rates can move large quantities of this type of sediment.

Sediments are deposited in calm areas where flow rates are low. Below the Retamal diversion dam is such an area. The Retamal structure is located in a bend of the river. The flood gates are operated to allow a design flood flow of 20,000 cfs to pass during times of storm flow and divert excess waters (105,000 cfs) into the Mexican interior floodway.

In general, flow rates in rivers are greater on the outside of any riverbend. Therefore, flow rates on the insides of riverbends are calmer, and tend to collect sediment. The Retamal Dam structure may have exacerbated the sediment collection process downstream of the dam, thus causing the formation of the island whose removal is the action addressed by this assessment. Alternatively, some erosion of the upstream point has occurred based on comparison of 1996 ortho imagery and 2003 ground survey.

3.3.3 Flood Control

The Project Area is located within the Special Flood Hazard Area (SFHA), FEMA Zone A, which is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. The last time the flood control gates at Retamal Diversion Dam were used to divert flood waters was during the Mexican flood in 1988 as a result of Hurricane Gilbert.

The normal dam operating water surface elevation is approximately 61 feet MSL during the non-irrigation season, or approximately 6 feet above the channel invert elevation. Using the HEC-RAS hydrologic model, the design flood flow (20,000 cfs) elevation is approximately 83.76 feet MSL.

3.4 WATER AND DREDGE MATERIAL QUALITY

3.4.1 Water

The headwaters of the Rio Grande originate in the San Juan Mountains of Colorado and flow 1,885.41 miles to the Gulf of Mexico. The floodplain is approximately 6.2 miles wide in Hidalgo County and widens into a delta in eastern Cameron County. A small portion of surface water from the LRGV flows into the Rio Grande. The majority of water flows northeast into storm water systems, which drain into the Laguna Madre (USIBWC 2003d).

Due to the basin's size and wide range of geologic and climatic conditions, the water quality of the Rio Grande varies greatly. Most of the flow of the Rio Grande is diverted for irrigation and municipal uses at the American Canal in Texas and the Acequia-Madre Canal in Mexico before it reaches El Paso. Downstream of El Paso, most of the flow consists of treated municipal wastewater from El Paso, rainfall runoff and irrigation return flow.

Flow increases again at Presidio/Ojinaga where inflow from Mexico's Rio Conchos enters the Rio Grande. The presence of metals and pesticides has been identified sporadically throughout the Rio Grande Basin. Elevated fecal coliform densities occur in the river downstream of major US-Mexico border cities due to municipal waste treatment facilities in Texas and untreated wastewater in Mexico. Downstream of International Falcon Dam, the river does not meet state contact recreation standards due to elevated fecal coliform levels.

Chloride, sulfate, and total dissolved solids concentrations are increasing in the Rio Grande due to repeated use of water for irrigation, especially in the west Texas portion of the basin. Water quantity as well as quality is an issue in this basin. High demands for irrigation and drinking water by both the United States and Mexico and an extended drought have caused a reduction in available water (TNRCC 2002).

Some water chemistry and physical measurements have been collected near the project site since 1995. Although water analysis was not directly included in the sediment and sampling analysis performed for this environmental assessment, the site water was analyzed by default because site water was used to mix with the sediment to perform the elutriate analysis, which had no exceedances of TCEQ criteria as discussed in subsection 3.4.2.

There has been limited historical water quality monitoring near the Project Area. Station ID 13180 listed in the Draft 2002 Texas Water Quality Inventory is representative of the Rio Grande from Pharr International Bridge to downstream of the Santa Ana Wildlife Refuge in Hidalgo County. Station 13180 is located only a few miles upstream of the Project Area. The Water Quality Inventory data states that on the river stretch near the project site there is a concern for high levels of chloride, sulfates, and total dissolved solids. It may be used as a finished water supply and not used for contact recreation due to high fecal coliform levels. The data also notes a fish kill of approximately 150 fish, near the Santa Ana Wildlife Refuge due to low dissolved oxygen levels on August 31, 1999 (TCEQ 2002a).

3.4.2 Dredge Material

Evaluation of the physical characteristics of dredge material is necessary to determine potential environmental impacts of disposal, the need for additional chemical or biological testing, as well as potential BU of the dredged material (USEPA 2002). The initial screening for contamination was designed to determine if the material contains any contaminants in forms and concentrations likely to cause unacceptable impacts to the environment. Field studies and sediment samples were collected in June 2003 at the Project Area (USIBWC 2003b). Chemical analysis of the dredge material provided data concerning background levels of specified potential pollutants. Analysis of the elutriate samples was conducted to assess expected release of potential pollutants from the sediment into the water column or as runoff from surface disposal of sediments. Analytical results of the sediment and elutriate samples are presented in Appendix B.

Results of all sediment and soil samples were below the TCEQ Tier 1 Sediment Protective Concentration Limits (PCL) for direct human contact indicating no sediment contaminants of concern (TCEQ 2002b; TCEQ 2003a; TCEQ 2003b).

Analysis of the sediment samples indicated that sand-sized particles dominated all grain size distributions, with samples having sand content from 64 to nearly 88 percent. Samples contained from 7 to 27 percent silt and from 3 to 14 percent clay-sized particles (USIBWC 2003b).

3.5 SOILS AND GEOLOGY

3.5.1 Soils

Most soils in the Project Area and the LRGV are the Southern Gulf Coastal Plains Province, which consists of nearly level to undulating soils of the Rio Grande Plain. Loamy soils and cracking clayey soils of the Rio Grande floodplain (Rio Grande-Matamoras soils) are found along the river from Brownsville to the Falcon Reservoir, while the Harlingen soil association forms the Rio Grande terraces in Cameron and parts of Hidalgo counties (Godfrey *et al.* 1973).

Soils in the Project Area are mapped as Zalla Loamy Fine Sand, Undulating, which are deeply drained soils on slopes from 0-3 percent. Bedding planes are weakly expressed, with alternating layers of sands and loamy sands. The Zalla Loamy Fine Sand is a hydric soil, with severe leaching and a moderate surface loss potential (USDA, NRCS 2003).

3.5.2 Geology

Hidalgo County topography is nearly flat to gently sloping. Elevation ranges from 40 feet above sea level on the eastern portion of the county, to 375 feet above sea level on the western side. General drainage is to the northeast with the exceptions of areas around La Joya Creek in the southwest (drainage to the south) and the Rio Grande floodplain (drainage to the east; USIBWC 2003d).

The Project Area has elevations ranging from approximately 46 to 90 feet above MSL. Elevation is highest along the riverbanks and center of the island. The riverbanks are approximately 20 feet above the river channel with a stepped slope ranging from 45-60 degrees.

The geology of the Project 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 2003d).

The sandstone and clay outcrops are from the Jackson Group and the Yegua and Laredo Formations. The Jackson Group is approximately 360 feet thick. The sandstone of the Jackson Group is commonly laminated and cross-bedded, white, gray, greenish brown or light brownish yellow, and fossiliferous. The clay deposits are sandy, calcareous, and greenish gray, pink, or red. Silicified wood is abundant in the Jackson Group. Some beds of white volcanic ash are present and limestone concretions are common. The Yegua Formation is approximately 400 feet thick and consists mostly of clay deposits. These deposits are chocolate brown to reddish brown and lighten upward. They produce a dark-gray soil. The sandstone is mostly quartz with some chert and weathers to loose, yellow-orange and reddish-brown soil. The Laredo Formation is approximately 620 feet thick and consists of thick, very fine to fine grained sandstone members in the upper and lower parts with clay in the middle. The sandstone members are predominantly red and brown. The clay weathers orange-yellow. Dark gray limestone concretions are common (USIBWC 2003d).

3.6 WETLANDS

Riparian areas along the lower reaches of the Rio Grande have been identified by the USFWS and Texas Parks and Wildlife Department (TPWD) as areas where wildlife habitat is rapidly vanishing and in need of protection (FWC 2001; University of Texas-Pan American 1995).

Considerable alteration of the riparian corridor area has occurred through a variety of events, including:

- Hydrologic modifications from dam construction, water diversions, and flood control levees;
- Geomorphic modifications due to changes in sediment transport, erosion, and other processes;
- Land use changes throughout the Rio Grande Valley; and
- Exotic vegetation, terrestrial and aquatic (FISRWG 1998).

Approximately 4,178 acres of palustrine, lacustrine and riverine wetlands occur in the LRGV, as shown in Table 3.6-1. Palustrine wetlands cover 3,961 acres (95 percent), lacustrine 165 acres (4 percent), and riverine 52 acres (1 percent).

Table 3-6-1 Wetlands within the LRGV

Wetland Type	Acres	Percentage
Palustrine		
forested	2,151	52
scrub-shrub	740	18
emergent	432	10
open water	638	15
Lacustrine	165	4
Riverine	52	1
TOTAL	4,178	100

Source: NWI Maps (1989)

Palustrine

Palustrine systems are all nontidal wetlands dominated by trees, shrubs, and other vegetation. Palustrine systems constitute the majority of wetlands in the Project Area and are commonly found around resacas and riparian habitat along the Rio Grande.

Lacustrine

Lacustrine systems are composed of deepwater habitats and associated wetlands situated in topographic depressions or dammed river channels. Lacustrine wetlands are common in the Project Area and are associated with the open water of resacas, ponds, lakes, reservoirs, and settling basins.

Resacas are old, abandoned river channels that measure from 1 to 6 feet deep and 30 to 150 feet wide. Resacas may hold water forming an oxbow lake or only hold water for part of the year. Oxbow lakes that were formed by the meandering of the Rio Grande are called a "banco." The term "resaca" is used to describe channels that have considerable linear extent. Some people do not differentiate between the two and use the term "resaca" to describe either situation. Resacas were traditionally refilled when the Rio Grande flooded, but now must rely on rainfall and runoff for recharge. Cattails (*Typha latifolia*) and willows often dominate the resacas (Ramirez 1986).

Riverine

Riverine systems are all wetlands and deepwater habitats within a river channel. The Rio Grande is the dominant riverine system in the LRGV. Wetlands in the Project area are riverine and occur on the island downstream of Retamal Dam and riparian margins of the Rio Grande. Wetlands on the island are dominated by arundo and black willow. The wetland margin on the Rio Grande ranges in width from 10–30 feet and typically found below 63 MSL. Table 3.6-2 presents jurisdictional wetlands within the Project Area.

Table 3.6-2 Project Area Wetland Summary

Vegetation Community	Jurisdictional Determination	Area (ac)	Comments
Vegetated Island			
Arundo flats	Riverine Wetland	0.37	Recent (< 25 years) fluvial deposits, dominated by FAC+ species. Unconsolidated substrate/detritus and mucky sand. LRR A4 "hydrogen sulfide indicator." Waterward of OHWL.
Arundo-Salix	Riverine Wetland	1.73	Recent (< 25 years) fluvial deposits, dominated by FAC+ FACW species. Unconsolidated substrate/sand. LRR A4 "hydrogen sulfide indicator." Mostly waterward of OHWL.
Salix-Celtis	Non-wetland	0.20	Recent (< 25 years) fluvial deposits, dominated by FAC/FACW species. Hydrology and hydric soil indicators not present. Landward of OHWL. Soil boring to 7 ft. until moist sand found

Table 3.6-2 Project Area Wetland Summary (…*continued*)

Vegetation Community	Jurisdictional Determination	Area (ac)	Comments
Riparian Margin			
Riprap	Non-wetland	0.33	Granite riprap and concrete apron
Salix-Fraxinus	Palustrine Wetland	0.34	Waterward of OHWL. LRR S6 Stripped matrix indicator
	Non-wetland	0.57	Fluvial deposits Landward of OHWL dominated by FACW species. Hydric soil indicators mostly not present (some variability). Potentially beyond USIBWC boundary for the northern areas of the community.
Seasonally Submerged Sandbar (Rio Grande)	Riverine open water/unconsolidated shore	1.40	Waters of the United States (waterward of OHWL and mostly open water).
Total Wetlands		**2.44**	
Total Area		**4.94**	

Source: USIBWC 2003b, modified.

3.7 VEGETATION

3.7.1 Natural Regions

The Project Area is within the Tamaulipan region of southern Texas and northeastern Mexico. The diversity of vegetation along with warm average temperatures in the Tamaulipan region creates one of the richest examples of habitat in the United States and Canada. Annual rainfall amounts in the area ranges from 16 to 35 inches increases from west to east. Average monthly rainfall is lowest in January and February, and highest during May or June.

Temperatures in this region are high in the summer. The soils at the South Texas Brush country natural region are clays and clay loams. Soil reactions vary from alkaline to slightly acidic.

Thorny brush is the predominant vegetation type in the region, including mesquite, acacia, prickly pear, and mimosa, among others. Areas of shallow soils and rapid drainage generally support this plant life. A grassland or savanna type vegetation which also occurs was somewhat more extensive in the 19th century and earlier, but long continued grazing and other factors have altered the plant communities to such a degree that ranches of the region now face a severe brush problem.

3.7.2 Vegetation

The vegetation communities within the Project Area are dominated by early successional species. The riparian margin immediately downstream of the riprap represents more structurally diverse habitat but heavily influenced by opportunistic arundo (*Arundo donax*).

Island Three subtypes of island vegetation community include, Arundo flats, Arundo-Salix and Salix-Celtis.

Arundo Flats Monotypic uneven aged stands of arundo. Overstory and understory are dominated by arundo with black willow contributing. Occasional cutgrass (*Leersia oryzoides*) is found in the herbaceous strata. The substrate is highly unconsolidated as a result of organic and sediment deposition between the island and U.S. riverbank.

Arundo-Salix Dominant vegetation community of the island. The overstory and understory are characterized by arundo and black willow with occasional cutgrass, umbel sedge (*Carex umbellate*) and arundo in herbaceous strata. The vegetation is impenetrable at places and the water table is near or at the surface with soils saturated to the surface.

Salix-Celtis This community represented the higher areas of the island (more than 63 feet above MSL) with black willow and sugar berry (*Celtis laevigata*) being the dominant overstory species. The understory is diverse with black willow, green ash (*Fraxinus pennsylvanica*) and anacua (*Ehertia anacua*) contributing. The herbaceous strata includes umbel sedge, Florida paspalum (*Paspalum floridanum*) and old mans beard (*Clematis drummondii*). Structural diversity, elevation, and unsaturated soil differentiated this community from the Arundo-Salix community. The substrate is composed of unsaturated sand.

Riparian Three subtypes of riparian community are present: Riprap, Salix-Fraxinus and Arundo. The majority of the riparian community is outside the USIBWC properties boundary (based on survey plats), however, the USIBWC does have legal authority over the "bed and banks" of the Rio Grande. As a result, some of the riparian areas outside the USIBWC property are nevertheless under USIBWC authority. Descriptions of the riparian community are below.

Riprap Riprap represented the armored bank beginning at the dam apron and extending 450 feet downstream. The riprap is overgrown with common bermudagrass (*Cynodon dactylon*), bufflegrass (*Pennisetum ciliare*) with occasional woody vegetation including, retama (*Parkinsonia aculeate*), nicotine tree (*Nicotiana glauca)* and black willow.

Salix-Fraxinus The riparian community was likely disturbed during dam construction (diversion channel construction) and represents growth within the previous two decades. A drift line (at 63 feet MSL) tended to separate wetlands from non-wetlands. Waterward of the overhead water line (OHWL), overstory species were dominated by black willow with green ash contributing. The understory species included green ash, buttonbush (*Cephalanthus occidentalis*) and arundo. The herbaceous strata includes arundo, poison ivy and umbel sedge. Landward of the OHWL, overstory species are dominated by black willow with green ash and sugarberry contributing. The understory species include sugarberry, black willow, and arundo. The herbaceous strata includes arundo and pepper vine (*Ampelopsis arborea*).

Arundo The community is monotypic even-aged stands of arundo on the river terrace. As an invader species, arundo has colonized disturbed areas on the higher terraces of the riparian community. Vegetation is impenetrable at some locations, with no evidence of hydrology or hydric soil indicators. The area is mostly within the USFWS boundary.

Oldfield Diverse herbaceous community established on disturbed soil. The area is upon overburden used to fill the temporary water diversion channel excavated during dam construction. Elevation of this area was brought to grade leaving little indication of former excavation. Dominant species within the herbaceous strata include bufflegrass, common bermudagrass, and sand dropseed (*Sporobolus cryptandrus*). Scattered woody species include husisach (*Acacia farnesiana*) and retama (*Parkinsonia aculeate*).

Salix-Acacia Parkland community established within the temporary water diversion channel (abandoned concrete columns still remain in the area). Elevation of this area was not brought to grade resulting in the site being 8 to 10 feet below grade. Although below grade, the area is well drained and dominated by black willow and husisach. Heavy herbaceous cover includes sand dropseed and bufflegrass. (See Table 3.7-1 for the classification of vegetation communities.)

Table 3.7-1 Vegetation Community Summary

Vegetation Community	Species Diversity	Structural Diversity	Relative Abundance
Island-(Arundo-Salix and Salix-Celtis)	Low richness-dominated by early successional species of black willow and arundo. Higher elevations include more sugarberry and others.	Moderate with overstory and understory. 80% bare ground/mud. More structural diversity in higher elevations with herbaceous and vine components.	Common riparian community along Rio Grande. Perhaps greater significance is the aquatic diversity island provides (shallow water and back water habitats).
Riparian (Salix-Fraxinus)	Relatively high species diversity yet marked by early and mid sere species. Many areas dominated by arundo and black willow.	Good structural diversity with overstory, understory and herbaceous/vine components. Mature trees > 25 years lacking. Riparian width somewhat narrow < 60 feet	Common riparian community along Rio Grande. Wetland conditions below the 63 feet MSL (drift line).

Table 3.7-1 Vegetation Community Summary (…*continued*)

Vegetation Community	Species Diversity	Structural Diversity	Relative Abundance
Arundo	Monotypic stands of arundo.	Understory and herbaceous > 90% arundo. Very dense and difficult to navigate through without machete.	Common. Arundo is an opportunistic species and frequently invades disturbed areas.
Oldfield	High number of herbaceous species (>16 recorded during visit) found on sandy loam overburden. Common Bermuda, bufflegrass and sand dropseed dominate.	Little structural diversity. Occasional shrubs. Areas appear to be periodically maintained. Granite riprap is stored on site.	Common. Large amount of introduced species (Bermuda, Johnson grass etc) have limited wildlife value.
Salix-Acacia	Moderate diversity- two species dominate overstory, acacia and black willow. Area part of old channel cut created during dam construction. Soil is sandy/loam overburden.	Overstory and herbaceous component. Parkland setting promotes diverse herbaceous component.	Common. Black willow is opportunistic species and frequently invades disturbed areas. Lack of wetland conditions diminishes potential uniqueness.
Thornscrub*	Moderate diversity with acacia dominating overstory. Disturbed soil conditions reflected by mosaic of upland and opportunistic species (arundo and black willow) throughout community.	Good structural diversity with overstory, understory and herbaceous components. Snags provide additional habitat. Fairly open canopy promotes thick herbaceous community. Age of community is less than 25 years based on historical aerial photograph.	Thornscrub is a desired community for much of the Lower Rio Grande Corridor initiative. The loss of thornscrub to agriculture and development has resulted in the listing of several species. The current community structure and plant density suggests that thornscrub community on USIBWC lands not potential habitat for the ocelot or Jaguarundi.

Source: USIBWC 2003b

3.8 WILDLIFE

Common wildlife species in the region include the whitetail deer, turkey, javelina, bobwhite quail, scaled quail, white-winged dove, mourning dove, cottontail rabbit, jackrabbit, waterfowl, and many kinds 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 (Williams *et al*. 1977). Many of the terrestrial wildlife species in the Project Area are limited in their distribution either partially or entirely to the Tamaulipan Biotic Province, and some are found only within the LRGV.

There are approximately 67 mammals of potential occurrence in the LRGV, including federal listed species, such as the Jaguarundi (*Felis yagouaroundi*) and ocelot *(Felis pardalis*). 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 (*Procyon lotor*), striped skunk (*Mephitis mephitis*), coyote *(Canis latrans*), Mexican ground squirrel (*Spermophilus mexicans*), and the bobcat (*Felis rufus*) (USIBWC 2003d), beaver (*Castor canadensis*) and nutria (*Myocastor coypus*), (Fermata 2003, USIBWC 2003b, USIBWC 2003d).

There are approximately 484 species of birds that potentially occur in the LRGV. The dominant numbers of avifauna are represented by the 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 and the point where many tropical birds reach their northernmost ranges (Fermata 2003).

Amphibians and reptiles are also well represented in the Project Area. 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 (TCWC 2003).

3.9 THREATENED, ENDANGERED, AND SENSITIVE SPECIES

Table 3.9-1 is a list of T&E species that the TPWD cites as potentially occurring in Hidalgo County. This list includes the USFWS-listed T&E species, state-listed species, and state species of concern. The table indicates whether the species would potentially occur at or near the project site as a resident, migrant, or not at all. In addition to those species, TPWD lists the Jaguarundi and the Vasey's Adelia *(Adelia vaseyi)* as occurring in the immediate area. Although Vasey's Adelia is a species of concern for Hidalgo County, it is not a federal or state listed species; therefore, it is not listed in Table 3.9-1. Descriptions of the species listed in the tables are included in Appendix C.

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Table 3.9-1 Federal and State Listed Species Potentially Occurring in the Surrounding Area

		Listing Status			Likelihood of Occurrence
Common Name	**Scientific Name**	**State**	**Federal**	**Required Habitat**	
Black Spotted Newt	*Notophthalmus meridionali*	T		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	**Potentially present**
Mexican Treefrog	*Smilisca baudinii*	T		subtropical region of extreme southern Texas; breeds May-October coinciding with rainfall, eggs laid in temporary rain pools	**Not likely present**
Sheep Frog	*Hypopachus variolosus*	T		predominantly grassland and savanna; moist sites in arid areas	**Not likely present**
South Texas Siren - large form	*Siren sp.* [1]	T		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	**Not likely present**
White-lipped Frog	*Leptodactylus labialis*	DL	E	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	**Not likely present**
American Peregrine Falcon	*Falco peregrinus anatum*	DL	E	potential migrant; nests in west Texas	**Potentially present**
Arctic Peregrine Falcon	*Falco peregrinus tundrius*	DL	T	potential migrant	**Potentially present**
Cactus Ferruginous Pygmy-owl	*Glaucidium brasilianum cactorum*	T		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	**Not likely present**
Common Black Hawk	*Buteogallus anthracinus*	T		cottonwood-lined rivers and streams; willow tree groves on the lower Rio Grande floodplain; formerly bred in south Texas	**Not likely present**
Gray Hawk	*Asturina nitidus*	T		mature woodlands of river valleys and nearby semiarid mesquite and scrub grasslands	**Not likely present**
Hook-billed Kite	*Chondrohierax uncinatus*	T		dense tropical and subtropical forests, but does occur in open woodlands; uncommon to rare in most of range; accidental in south Texas	**Not likely present**
Interior Least Tern	*Sterna antillarum athalassos*	E	LE	nests along sand and gravel bars within braided streams, rivers & some inland lakes	**Not likely present**

Table 3.9-1 Federal and State Listed Species Potentially Occurring in the Surrounding Area (*…continued*)

		Listing Status			Likelihood of Occurrence
Common Name	**Scientific Name**	**State**	**Federal**	**Required Habitat**	
Northern Beardless-tyrannulet	*Camptostoma imberbe*		T	mesquite woodlands; near Rio Grande frequents cottonwood, willow, elm, and great lead tree; breeding April to July	**Not likely present**
Reddish Egret	*Egretta rufescens*	T		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.	**Not likely present**
Rose-throated Becard	*Pachyramphus aglaiae*	T		riparian trees, woodlands, open forest, scrub, and mangroves; breeding April to July	**Not likely present**
Sennett's Hooded Oriole	*Icterus cucullatus senneti*			often builds nests in and of Spanish moss (*Tillandsia unioides*); feeds on invertebrates, fruit, and nectar; breeding March to August	**Not likely present**
Tropical Parula	*Parula pitiayuma*	T		dense or open woods, undergrowth, brush, and trees along edges of rivers and resacas; breeding April to July	**Potentially present**
White-faced Ibis	*Plegadis chihi*	T		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	**Not likely present**
White-tailed Hawk	*Buteo albicaudatus*	T		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	**Not likely present**
Wood Stork	*Mycteria americana*	T		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	**Not likely present**
Zone-tailed Hawk	*Buteo albonotatus*	T		rough, deep, rocky canyons and streamsides in semiarid mesa, hill, and mountain terrain; breeding March to July	**Not likely present**

Table 3.9-1 Federal and State Listed Species Potentially Occurring in the Surrounding Area (…*continued*)

		Listing Status			Likelihood of Occurrence
Common Name	**Scientific Name**	**State**	**Federal**	**Required Habitat**	
River Goby	*Awaous tajasica*	T		clear water with slow to moderate current, sandy or hard bottom, and little or no vegetation; also enters brackish and ocean waters	**Not likely present**
Bluntnose Shiner	*Notropis simus (extirpated)*	T		main river channels, often below obstructions over substrate of sand, gravel, and silt; damming and irrigation practices presumed major factors contributing to decline	**Not likely present**
Coues' Rice Rat	*Oryzomys couesi*	T		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	**Not likely present**
Jaguar	*Panthera onca (extirpated)*	E	LE	()- dense chaparral; no reliable TX sightings since 1952	**Not likely present**
Jaguarundi	*Herpailurus yaguarondi*	E	LE	thick brushlands, near water favored; 6 month gestation, young born twice per year in March and August	**Potentially present**
Ocelot	*Leopardus pardalis*	E	LE	dense chaparral thickets; mesquite-thorn scrub and live oak mottes; avoids open areas; breeds and raises young June-November- Possible sightings by boarder patrol near the Project Area	**Potentially present**
Southern Yellow Bat	*Lasiurus ega*	T		associated with trees, such as palm trees (*Sabal mexicana*) in Brownsville, which provide them with daytime roosts; insectivorous; breeding in late winter	**Not likely present**
White-nosed Coati	*Nasua narica*	T		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	**Not likely present**
Reticulate Collared Lizard	*Crotaphytus reticulatus*	T		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	**Not likely present**

Table 3.9-1 Federal and State Listed Species Potentially Occurring in the Surrounding Area (…*continued*)

		Listing Status			Likelihood of Occurrence
Common Name	**Scientific Name**	**State**	**Federal**	**Required Habitat**	
Black striped snake	*Coniophanes imperialis*	T		extreme south Texas; semi-arid coastal plain, warm, moist micro-habitats and sandy soils; proficient burrower; eggs laid April-June	**Potentially present**
Indigo Snake	*Drymarchon corais*	T		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. Shed skin observed during field studies.	**Present**
Northern cat-eyed snake	*Leptodeira septentrionalis*	T		Gulf Coastal Plain south of the Nueces River; thorn brush woodland; dense thickets bordering ponds and streams; semi-arboreal; nocturnal	**Not likely present**
Speckled racer	*Drymobius margaritiferus*	T		extreme south Texas; dense thickets near water, Texas palm groves, riparian woodlands; often in areas with much vegetation litter on ground; breeds April-August	**Potentially present**
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, uses rodent burrows, or hides under surface cover	**Not likely present**
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	**Not likely present**
Walker's manioc	*Manihot walkerae*	E	LE	periphery of native brush in sandy loam; also on caliche cuestas; flowering April-September (following rains)	**Not likely present**
Texas Ayenia	*Ayenia limitaris*	E	LE	Woodlands on alluvial deposits on floodplains and terraces along the Rio Grande	**Potentially present**

E – Endangered
T – Threatened
NL – Not listed
TSA- Threatened by similarity of appearance
P/T – Federally proposed for threatened status
w/CH – with critical habitat

3.10 AQUATIC RESOURCES

3.10.1 Fish

In general, most aquatic and terrestrial creatures in the LRGV favor fringe-type habitat where one habitat type transitions into another (USIBWC 2003d). The sediment island downstream from Retamal Dam has developed into such a habitat. The backwaters and mud flats that pass between the island and the riverbank, flow very slowly creating an area utilized by benthic macroinvertebrates including insects (larval forms), worms, mussels, and crustaceans (shrimp, crawfish, *etc*.), smaller forage fish and the fry of larger fish as they mature.

There are approximately 178 species of fish that could potentially occur near the Project Area (USIBWC 2003d). In a 1990 study by Texas A&M at Galveston, 45 fish species were found to inhabit the LRGR from RM 51 near Brownsville to RM 195 upstream of Anzalduas Dam. The dominant fish species in the 134 mile stretch of river were inland silverside (*Menidia beryllina*), mosquitofish (*Gambusia affinis*), red shiner (*Notropis lutrensis*), channel catfish *(Ictalurus punctatus)* and threadfin shad *(Dorosoma petenense),* which together produced 81 percent of all fish captured during the 1990 study. Large forage fish include carp (*Cyprinus carpio*), buffalo (*Ictiobus* spp.), striped mullet (*Mugil cephalus*), catfish, and sunfish (Fermata 2003, USIBWC 2003d).

The variable nature of the flow in the Rio Grande causes fluctuations in the number and concentrations of fish, forcing them to constantly move up and down river to feed and spawn according to the water levels available.

The Draft 2002 Texas Water Quality Inventory data also note a fish kill of approximately 150 fish, near the Santa Ana Wildlife Refuge due to low dissolved oxygen levels on August 31, 1999 (TCEQ 2002a). The Santa Ana Wildlife Refuge area is located a few miles upstream from the Retamal Diversion Dam.

3.11 AIR QUALITY

3.11.1 Air Quality Regulations

The Clean Air Act (CAA) of 1970, as amended by the CAA amendments of 1990, directed the USEPA to develop, implement, and enforce strong environmental regulations that would ensure cleaner air for all Americans. In order to protect public health and welfare, the USEPA developed concentration-based standards called National Ambient Air Quality Standards (NAAQS). The promulgation of the CAA was driven by the failure of nearly 100 cities to meet the NAAQS for ozone and carbon monoxide and by the inherent limitations in previous regulations to effectively deal with these and other air quality problems. The USEPA established both primary and secondary NAAQS under the provisions of the CAA. Primary standards define levels of air quality necessary to protect public health with an adequate margin of safety. Secondary standards define levels of air quality necessary to protect public welfare (*i.e*., soils, vegetation, property, and wildlife) from any known or anticipated adverse impacts from criteria air pollutants.

NAAQS are currently established for six air pollutants (known as "criteria air pollutants") including carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), sulfur oxides (SO_X, measured as sulfur dioxide, SO_2), lead (Pb), and particulate matter. Particulate matter standards incorporate two particulate classes: 1) particulate matter with an aerodynamic diameter less than or equal to 10 micrometers (PM_{10}), and 2) particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers ($PM_{2.5}$). Only PM_{10} is currently regulated by the rule.

The CAA does not make the NAAQS directly enforceable. However, the Act does require each state to promulgate a state implementation plan (SIP) that provides for implementation, maintenance, and enforcement of the NAAQS in each AQCR in the state. The CAA also allows states to adopt air quality standards that are more stringent than the federal standards. As promulgated in the Texas Administrative Code, Title 30, Subchapter A, the State of Texas has adopted NAAQS as the Texas standards listed in Table 3.11-1.

Table 3.11-1 National and State Ambient Air Quality Standards

Criteria Pollutant	Averaging Time	Primary NAAQS[a,b,c]	Secondary NAAQS[a,b,d]
Carbon Monoxide	8-hour 1-hour	9.5 ppm (10 mg/m^3) 35.5 ppm (40 mg/m^3)	9.5 ppm (10 mg/m^3) 35.5 ppm (40 mg/m^3)
Lead	Quarterly	1.55 μg/m^3	1.55 μg/m^3
Nitrogen Dioxide	Annual	0.0543 ppm (100 μ/m^3)	0.0543 ppm (100 μg/m^3)
Ozone	1 hour	0.125 ppm (235 μg/m^3)	0.125 ppm (235 μg/m^3)
PM_{10}	Annual 24-hour	51 μg/m^3 155 μg/m^3	51 μg/m^3 155 μg/m^3
$PM_{2.5}$	Annual 24-hour	15 μg/m3 66 μg/m3	15 μg/m3 66 μg/m3
Sulfur Oxides (measured as SO_2)	Annual 24-hour 3-hour	0.035 ppm (80 μg/m^3) 0.145 ppm (365 μg/m^3) No standard	No standard No standard 0.55 ppm (1,300 μg/m^3)

Source: USEPA 2003.
PM_{10} Particles with aerodynamic diameters less than or equal to a nominal 10 micrometers
$PM_{2.5}$ Particles with aerodynamic diameters less than or equal to a nominal 2.5 micrometers

a National standards (other than O_3, particulate matter, and those based on annual averages or annual arithmetic mean) are not be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8- hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when 99 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

b The NAAQS are based on standard temperature and pressure of 25 Celsius and 760 millimeters of mercury.

c National Primary Standards: The levels of air quality necessary to protect the public health with an adequate margin of safety. Each state must attain the primary standards no later than 3 years after the state implementation plan is approved by the USEPA.

d National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse impacts of a pollutant. Each state must attain the secondary standards within a "reasonable time" after the state implementation plan is approved by the USEPA.

3.11.2 Regional Air Quality

The USEPA classifies the air quality within an AQCR according to whether or not the concentration 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 the air quality within an area is as good as or better than the NAAQS. Nonattainment indicates that air quality within a specific geographical area exceeds applicable NAAQS. Unclassifiable and not designated indicates that the air quality cannot be or has not been classified based on available information as meeting or not meeting the NAAQS and is therefore treated as attainment. Before a nonattainment area is eligible for reclassification to attainment status, the state must demonstrate compliance with NAAQS in the nonattainment area for three consecutive years and demonstrate, through extensive dispersion modeling, that attainment status can be maintained in the future even with community growth.

The Project Area is located within the Brownsville-Laredo Air Quality Control Region (AQCR) 213. 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 August 2001, the USEPA designated air quality within all counties of AQCR 213 under attainment status for all criteria pollutants (USEPA 2001).

TCEQ has identified 11 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 several oil mills and refineries, manufacturing and electronics companies, and utilities and gasoline facilities (TNRCC 2003). The permitted stationary point source emission inventory for Hidalgo County for calendar year 2000 (latest available data as of June 2002) is presented in Table 3.11-2.

Table 3.11-2 Stationary Point Source Emissions Inventory for Hidalgo County

Air Pollutant Emission Source	CO (tpy)	VOC (tpy)	NO_X (tpy)	SO_X (tpy)	PM_{10} (tpy)
Hidalgo County Emissions Inventory[a]	3,674	601	2,615	59	374

Tpy: tons per year
[a] TNRCC 2003

3.12 NOISE

Federal and local governments have established noise guidelines and regulations for the purpose of protecting citizens from potential hearing damage and from various other adverse physiological, psychological, and social impacts associated with noise. The Federal Interagency Committee on Urban Noise developed land-use compatibility guidelines for noise in terms of day-night average sound level (DNL) (USDT 1980). It is recommended that no residential uses, such as homes, multifamily dwellings, dormitories, hotels, and mobile home parks, be located where the noise is expected to exceed a DNL of 65 dBA. The DNL is the energy average A-weighted acoustical level for a 24-hour period with a 10-decibel upward adjustment added to the nighttime levels. Some commercial and industrial uses are considered acceptable where the noise level exceeds NDL of 65 dBA. For outdoor activities, the USEPA recommends DLN 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).

Land-use and zoning classifications in the area surrounding the Project Area provide an indication of potential noise impact. Land use surrounding Retamal Dam is predominantly agricultural. Due to the flood-prone nature of land within this area, no sensitive noise receptors are located in or surrounding the Project Area. These would include schools, churches, and medical facilities. The major noise sources in the Project Area are associated with agricultural activities.

Typical outdoor noise sources in the Project Area include vehicles, pickup trucks, diesel tractor mowers, and other farm machinery. Noise sources such as mowers at 100 feet, or a diesel truck at 50 feet are approximately 70 dBA and 88 dBA, respectively. Equipment used for vegetation maintenance along the levees would be approximately 82.5 dBA at 50 feet (CERL 1978).

3.13 CULTURAL RESOURCES

Historic and archeological resources were discussed in detail in the draft EIS for Alternative Vegetation Management Practices for the LRGFCP for Cameron, Hidalgo, and Willacy Counties, Texas (USIBWC 2003d). The EIS presented findings of cultural resources surveys, which were conducted in accordance with the National Historic Preservation Act (NHPA) of 1966 and the Archeological Resource Protection Act to identify historic and archeological resources, which may be affected by alternative vegetation maintenance practices. If archaeological resources are discovered that may be disturbed during site activities, then the Act requires permits for excavating and removing the resource.

Although numerous sites were documented as having cultural significance in Hidalgo County, none were identified within the Project Area. Additionally, no significant archaeological and historical resources were identified within a 1-mile radius during the environmental database search of historic sites (EDR 2003; USIBWC 2003d).

3.14 HAZARDOUS AND TOXIC WASTE

Hazardous materials are those substances defined by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA) and the Toxic Substances and Control Act (TSCA). Hazardous wastes are defined under the Solid Waste Disposal Act (SWDA), 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 danger to public health and/or welfare and to the environment when released or improperly managed.

Waste disposal activities at or near the Project 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 database search of hazardous, toxic, and radioactive waste sites was conducted within a 1-mile radius of the Project Area identified no adjacent sites classified as or listed on any of the following:

- The National Priority List (NPL)
- RCRA Corrective Actions and associated Transport, Storage, and Disposal list
- State equivalent priority list
- State equivalent Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) list
- Currently or formerly under review by the USEPA
- RCRA permitted treatment, storage, and disposal facilities
- Leaking underground storage tanks
- Permitted as solid waste landfills, incinerators, or transfer stations
- Registered USTs
- Registered aboveground storage tanks
- Emergency Response Notification System of Spills (ERNSS) list
- RCRA registered large generator of hazardous waste
- RCRA registered small generator of hazardous waste
- State spills list.

A review of available historical aerial photographs was also conducted to assist in identifying past land uses and potential environmental contamination sources, and to verify other information found in the records search. Results of the review did not reveal any potential sites within the Project Area or surrounding areas. Historical aerial photographs and topographic maps are included in the Results of Field Studies and Information Research Report (USIBWC 2003b).

3.15 SOCIOECONOMICS

The Retamal Diversion Dam is located in a sparsely populated portion of southeastern Hidalgo County. The county's southern border consists of 1,596 square miles of Rio Grande delta (Hidalgo County 2003). Within a 2-mile radius of the Project Area are two units of the Las Palomas Wildlife Management Area (WMA); one is located to the northeast, the other to the west and southwest. Development is located approximately 9 miles north and east from the Project Area. The nearest populated areas to the Project Area are the cities of Weslaco and Donna to the north, Progreso and Progreso Lakes to the east, and Parajitos, a colonia southeast of Progreso.

3.15.1 Population

Hidalgo County's total population in 2000 was approximately 569,463, a 33 percent increase from 383,545 in 1990 (USCB 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. Table 3.15-1 shows the percent change from 1990 to 2000 in population for McAllen, Mission, and Pharr as well towns and communities within approximately 10 miles from the project site.

Table 3.15-1 Historical Population Data

	1990	2000	Percent Change 1990 - 2000
State of Texas	16,986,510	20,851,820	19%
Hidalgo County	383,545	569,463	33%
McAllen	84,021	106,414	21%
Mission	28,653	45,408	37%
Pharr	32,921	46,660	29%
Weslaco	21, 877	26,935	19%
Donna	12,751	14,768	14%
Progreso	2,037	4,851	58%
Progreso Lakes	121	259	53%

USCB 2000

Hidalgo County has several communities referred to as Census Designated Places (CDP). The Texas Office of the Attorney General and the U.S. Census Bureau has designated colonias as CDPs in five Texas counties (USCB 2000). These communities are named, unincorporated communities with a mixture of residential, commercial, and retail areas. Parajitos, CDP is the nearest colonia to the Project Area (see Subsection 3.15.6).

South Texas is considered the fastest growing region in Texas with the Lower Rio Grande region showing a projected increase of 181 percent from 2000 to 2040 (Texas A&M University 2003). It is estimated that the McAllen-Edinburg-Mission metropolitan area will have a population of more than 1 million by 2030 (Texas A&M University 2003). Hidalgo County's population is estimated to be approximately 1,843,141 by the year 2040 (Texas Comptroller's Office 2003).

Racial composition of Hidalgo County and the nearest communities to the Project Area are shown in Table 3.15-2. The largest racial category for the county and communities near the Project Area is "Hispanic or Latino," with the exception of Progreso Lakes. The largest racial category in Progreso Lakes is "White" as indicated in Table 3.15-2.

Table 3.15-2 Racial Composition of Hidalgo County and Communities Located Along the Rio Grande

Race	Hidalgo County		Weslaco		Donna		Progreso		Progreso Lakes	
	No.	%	No.	%	No.	%	No.	%	No.	%
Hispanic or Latino (any race)	503,100	88.3	22,560	83.8	12,886	87.3	4,803	99.0	93	39.7
ONE RACE										
White	59,423	10.4	3,961	14.7	1,801	12.2	45	0.9	140	59.8
Black or African American	1,934	0.3	32	0.1	24	0.2	0	0.0	0	0.0
American Indian and Alaska Native	428	0.1	26	0.1	9	0.1	0	0.0	0	0.0
Asian		0.6	298	1.1	25	0.2	2	0.0	1	0.4
Native Hawaiian/Other Pacific Islander	37	0.0	1	0.0	0	0.0	0	0.0	0	0.0
Some other race	171	0.2	15	0.1	3	0.0	1	0.0	0	0.0
Two or more races	1,163	0.2	42	0.2	20	0.1	0	0.0	0	0.0
Total Population	569,463		26,935		14,768		4,851		234	

Source: USCB 2000

The median age for Hidalgo County and communities near the Project Area is presented in Table 3.15-3. Median age for the communities of Weslaco and Donna is similar to the county as a whole with Progreso showing the lowest median age of 21.6 and Progreso Lakes with the highest median age of 43.2. Gender percentages within the county and the communities of Weslaco and Donna are similar except for Progreso and Progreso Lakes where the percentages for males are slightly higher.

Table 3.15-3 Population Distribution by Age and Gender

	Median Age	Gender	
		Male (%)	Female (%)
Hidalgo County	27.3	48.4	51.6
Weslaco	30.8	46.3	53.7
Donna	28.9	48.4	51.6
Progreso	21.6	51.2	48.8
Progreso Lakes	43.2	51.7	48.3

Source: USCB 2000

3.15.2 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 government (federal, state, and local) and retail trade at 43,807 and 30,217 jobs, respectively. Top employers in the county include H.E. Butt Grocery Company, Wal-Mart Associates, Inc., Williamson-Dickie Manufacturing Company, McAllen ISD and Rio Grande Regional Hospital (Texas A&M University 2003). The unemployment rate in 2001 was 13.7 percent as compared to the statewide unemployment rate of 5.6 percent (Texas A&M University 2003).

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 Project Area is primarily agricultural. Employment in the City of Weslaco, the nearest populated community to the Retamal Diversion Dam, is centered on the agricultural industry. There are several cotton gins and produce packing plants operating in downtown Weslaco (Weslaco Chamber of Commerce 2003).

3.15.3 Income

Income and poverty figures obtained from the 2000 U.S. Census Bureau for Hidalgo County and communities from which construction workers for the proposed project will originate are provided in Table 3.15-4. As indicated in the table, per capita income for Weslaco and Donna are similar to Hidalgo County's per capita income of $9,899. Progreso's per capita income of $4,789 is approximately half of per capita income recorded for the county. Progreso Lakes per capita income of $24,029 is nearly double that of Hidalgo County.

Table 3.15-4 2000 Income and Poverty

Income and Poverty Characteristics	Hidalgo County		Weslaco		Donna		Progreso		Progreso Lakes	
Total Population	569,463		26,935		14,768		4,851		259	
Total Number of Families	133,186		6,529		3,582		979		70	
Median Family Income	26,009		29,215		23,892		18,313		72,500	
Families below the poverty line	41,725	31.3%	1,733	26.5%	1,168	32.6%	503	51.3%	3	4.3%
Individuals below the poverty line	201,865	35.9%	8,164	30.9%	5,494	37.8%	2,513	50.9%	11	4.2%
Total Number of Households	156,709		8,213		4,194		1,053		75	
Median Household Income	24,863		26,573		22,800		18,184		68,125	
Per Capita Income (dollars)	9,899		11,235		8,569		4,789		24,029	

Source: USCB 2000

Hidalgo County records 31.3 percent of the families are below the poverty line. The communities of Donna and Weslaco have similar percentages to that of the county at 32.6 percent and 26.5 percent, respectively. Progreso's percentage is much higher than the county's percentage at 51.3 percent and Progreso Lakes' percentage is significantly lower at 4.2 percent.

3.15.4 Housing

According to the 2000 U.S. Census, Hidalgo County has 192,658 total housing units; of which, 81 percent are occupied and 19 percent are vacant. In the communities closest to the

Project Area, the availability of housing is low with only 7 percent of the housing units vacant in Progreso and 9 percent in Progreso Lakes. However, the larger communities to the north show greater housing availability with a 20 percent vacancy in Weslaco and 28 percent vacancy in Donna. Total housing units, occupied housing, and vacant housing units are shown in Table 3.15-5.

Table 3.15-5 Housing Units

	Hidalgo County		Weslaco		Donna		Progreso		Progreso Lakes	
Total Housing Units	192,658		10,207		5,763		1,122		93	
Occupied Housing Units	156,824	81%	8,197	80%	4,154	72%	1,039	93%	85	91%
Vacant Housing Units	35,834	19%	2,010	20%	1,609	28%	83	7%	8	9%

U.S. Census Bureau 2000

3.15.5 Community Infrastructure

The immediate area surrounding the Project Area is rural. Progreso Independent School District, Donna Independent School District, and Weslaco Independent School serve the communities near the Project Area. Progreso Independent School District is a small school district in the community of Progreso, approximately 2 miles from the Retamal Diversion Damn. Total enrollment for the 2001-2002 school year was 2,052 students (Progreso Independent School District 2003). The district has a total of five campuses: one high school, one alternative school, one middle school, one elementary school, and one early childhood center. The University of Texas at Brownsville and the Texas Southmost College, both located in Brownsville approximately 35 miles from Progreso, are the nearest public 4-year colleges.

Progreso is located at the intersection of U.S. Highway 281 and Farm Road 1015. The nearest major interstate is Interstate 37 approximately 158 miles northeast of Progreso. Progreso Airport is located approximately 1 mile east of Progreso. It is privately owned by U.S. Customs and provides general aviation services (Airnav.com 2003). The longest runway is paved and extends 4,470 feet. The International Bridge provides access for businesses and tourists to Mexico and is approximately 2 miles south of Progreso. In the year 2000, approximately 1.3 million vehicles and 1.2 million pedestrians crossed the bridge into Progreso, Mexico (Weslaco Chamber of Commerce 2003).

The nearest medical facilities are located in Weslaco. Knapp Medical Center is the nearest hospital with a total of 233 beds. There are approximately 12 clinics serving the area, including the Weslaco Heart Center (Weslaco Chamber of Commerce 2003). Magic Valley Electric Co-Op provides electricity to Progreso and water is supplied from the Rio Grande through Hidalgo & Cameron District #9.

3.15.6 Colonias

Hidalgo County has numerous colonias near the United States-Mexico border. Colonias are …"unincorporated border communities that often lack adequate water and sewer systems, paved roads, and safe, sanitary housing." Housing in the colonias are typically makeshift structures of wood, cardboard, or other materials; residents improve their homes when finances allow (Texas Department of Housing and Community Affairs [TDHCA] 2003). The population of these settlements is typically individuals of low and very low income and predominantly Hispanic. Residents in colonias are primarily unskilled, seasonal workers with very low incomes. Agriculture service providers and construction-related jobs account for 50 percent of the colonias workforce (TDHCA 2003). In Hidalgo County, the average annual income is $8,899.

The nearest colonia to the Project Area, Parajitos, is located approximately 5 to 6 miles northeast near the community of Progreso. East and north of Parajitos, within Progreso, there are approximately 15 colonias scattered throughout the community. A cluster of several colonias is located southeast and south of Weslaco.

3.16 ENVIRONMENTAL JUSTICE

Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, was issued by the president on February 11, 1994. The EO requires 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, the Proposed Action must be evaluated in terms of an adverse effect that:

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

b) will 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.

Data from Tables 3.15-2 and 3.15-4 indicate that Hidalgo County has disproportionately high minority (approximately 89 percent) and low-income populations (individuals – 35.9 percent) in relation to the State of Texas.