

**ENVIRONMENTAL ASSESSMENT FOR
SHARYLAND UTILITIES, L.P. PROPOSED
138-KV DC MEXICO TIE PROJECT
HIDALGO COUNTY, TEXAS**

U.S. Department of Energy
Office of Fossil Energy
Washington, DC

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Acronyms and Abbreviations

ac	acre
AC	alternating current
APLIC	Avian Power Line Interaction Committee
BCA	Bird Conservation Area
BEA	Bureau of Economic Analysis
BEG	Bureau of Economic Geology
BTB-HVDC	back-to-back high-voltage, direct current
CCN	Certificate of Convenience and Necessity
CEQ	Council on Environmental Quality
CFE	Comision Federal de Electricidad
cm	centimeter
CO	carbon monoxide
CPCE	Cornelius-Pierce Consulting Engineers
DC	direct current
DOE	U.S. Department of Energy
EA	environmental assessment
EH&A	Espey, Huston & Associates, Inc.
EJ	Environmental Justice
EMF	electric and magnetic field
EO	Executive Order
EPA	Environmental Protection Agency
ERCOT	Electric Reliability Council of Texas
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
FE	Office of Fossil Energy
FEMA	Federal Emergency Management Agency
FM	Farm-to-Market Road
FPA	Federal Power Act
Frontera	Frontera Generation Limited Partnership
ft	feet/foot
FWS	U.S. Fish and Wildlife Service
ha	hectares
HPA	high probability area
HVDC	High Voltage Direct Current
IBWC	International Boundary and Water Commission
km	kilometers
kV	kilovolt

kV/m	kilovolts per meter
LRGFCP	Lower Rio Grande Flood Control Project
LRGV	Lower Rio Grande Valley
m	meter
mG	milligauss
MSA	Metropolitan Statistical Area
MSL	mean sea level
MW	megawatts
NAFTA	North American Free Trade Agreement
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOI	Notice of Intent
NO ₂	nitrogen dioxide
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRI	National Resource Inventory
NWI	National Wetlands Inventory
NWR	National Wildlife Refuge
O ₃	ozone
Pb	lead
PM	particulate matter
PUC	Public Utility Commission of Texas
RMR	reliability must-run
ROW	right-of-way
SCS	Soil Conservation Service, now the Natural Resources Conservation Service (NRCS)
Sharyland	Sharyland Utilities L.P.
SOC	species of concern
SO ₂	sulfur dioxide
sq ft	square feet
sq m	square meters
SWPPP	Storm Water Pollution Prevention Plan
TASS	Texas Agricultural Statistics Service
TCEQ	Texas Commission on Environmental Quality
TCOS	Transmission Cost of Service
TCPA	Texas Comptroller of Public Accounts
TOES	Texas Organization for Endangered Species
TPDES	Texas Pollution Discharge and Elimination System
TPWD	Texas Parks and Wildlife Department
TSDC	Texas State Data Center

TWC	Texas Workforce Commission
TWDB	Texas Water Development Board
TXBCD	Texas Biological and Conservation Data System
TxDOT	Texas Department of Transportation
USACE	U.S. Army Corps of Engineers
USBOC	U.S. Bureau of the Census
USC	United States Code
USGS	U.S. Geological Survey
WMA	wildlife management area

1.0 INTRODUCTION

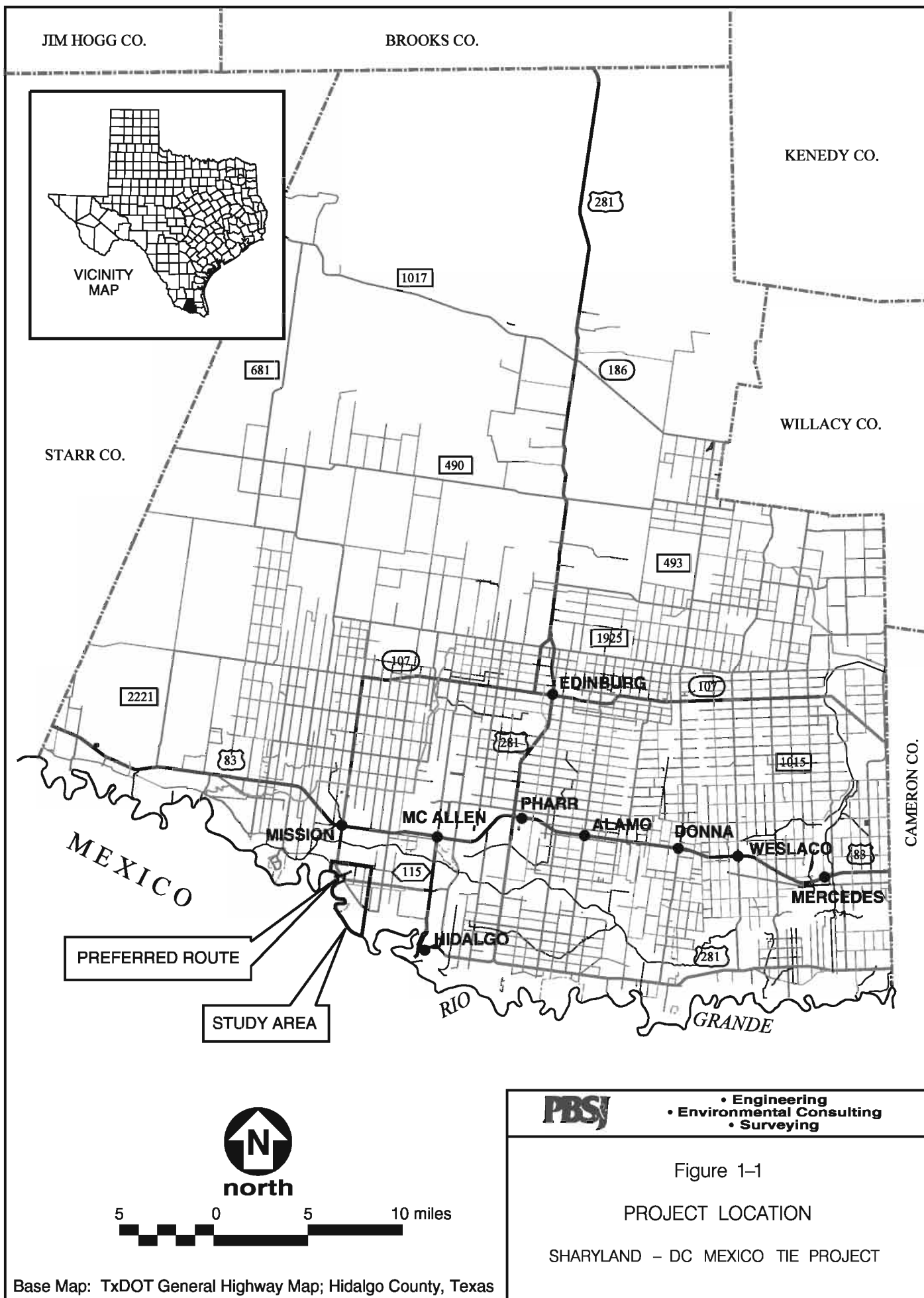
Under Executive Order (EO) 10485 of September 3, 1953, as amended by EO 12038 of February 3, 1978, no one may construct, operate, maintain or connect electric transmission facilities at the U.S. international border for the transmission of electric energy between the United States and a foreign country without first obtaining a Presidential permit from the U.S. Department of Energy (DOE). In addition, before electric energy can be exported from the United States to a foreign country, an electricity export authorization must be obtained from DOE pursuant to section 202(e) of the Federal Power Act (FPA) (16 U.S.C. §824a(e)).

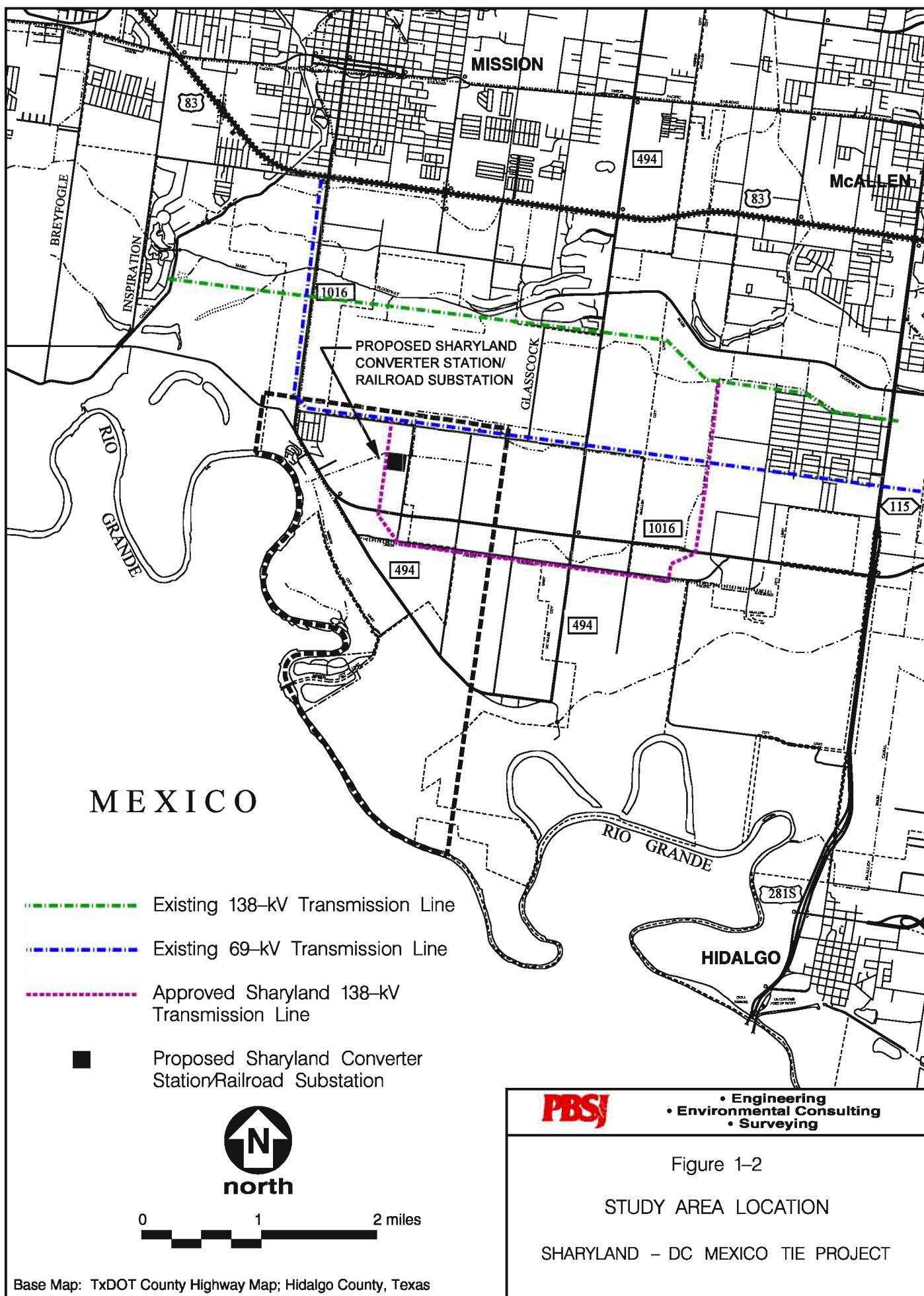
On September 11, 2003, Sharyland Utilities L.P. (Sharyland) filed an application with DOE's Office of Fossil Energy (FE) for a Presidential Permit to construct, operate, maintain and connect a 138,000-volt (138-kV) electric transmission line across the U.S.-Mexico border in Hidalgo County, Texas. Sharyland is an investor-owned utility located in McAllen, Texas. Sharyland provides transmission and distribution service within a 6,000-acre master-planned community, called Sharyland Plantation, situated between the cities of McAllen and Mission along the border between Texas and Mexico (Figure 1-1). The proposed transmission facilities would originate at Sharyland's Railroad Substation, located in Hidalgo County, Texas, and extend approximately 1.6 kilometers (km) (1 mile) to the U.S.-Mexico border (Figure 1-2). At the border, these facilities would interconnect with similar facilities to be owned and operated by the Comision Federal de Electricidad (CFE), the national electric utility of Mexico.

DOE is preparing this environmental assessment (EA) in accordance with the National Environmental Policy Act of 1969 (NEPA), 42 United States Code (U.S.C.) §§ 4321 et seq., to address reasonably foreseeable impacts from the proposed federal action (granting or denying a Presidential Permit for the proposed transmission facilities) and reasonable alternatives, including the No Action Alternative, pursuant to DOE's NEPA Implementing Procedures (10 CFR Part 1021).

The Electric Reliability Council of Texas (ERCOT) and CFE have a long history of emergency assistance across the Mexico/United States border. However, despite the fact that ERCOT and CFE share a common border of several hundred kilometers (miles), exchanges of electric energy between ERCOT and CFE are minimal. Together, they prepared a joint interconnection study¹ in December 2003 that outlines the opportunities and benefits that could be realized by both systems by the installation of new synchronous ties in remote areas for block load support, and asynchronous interconnections, such as that proposed by Sharyland, using High Voltage Direct Current (HVDC), in other regions of the border, to provide effective and rapid support for emergency conditions in the border region. The study identifies several interconnection opportunities and specifically identifies the international transmission line proposed by Sharyland (Railroad Substation to Cumbres Substation) as one option, in the vicinity of McAllen, Texas, that would provide improved electric reliability for CFE and ERCOT.

¹ The complete text of the study is available at www.puc.state.tx.us/electric/reports/mir/mi_report.pdf





Sharyland indicated in its Presidential permit application that it does not intend to export electric energy to Mexico, on its own behalf, using the proposed facilities. Rather, Sharyland intends to operate the proposed facilities as “open access” facilities available for use by other parties to transfer electric power between the United States and Mexico. Prior to such use of the proposed facilities, any entity subject to section 202(e) of the FPA must obtain an electricity export authorization from the Department of Energy.

1.1 SCOPE OF PROJECT

Sharyland proposes to construct 138-kV electric transmission facilities between its existing transmission facilities in Hidalgo County, Texas, and CFE in Mexico’s State of Tamaulipas. The “Sharyland HVDC Interconnection Project” would involve construction of approximately 1.6 km (1 mile) of single-circuit 138-kV transmission line, on a single support structure, and a back-to-back high-voltage, direct current (BTB-HVDC) converter station within the United States. The proposed transmission line would “tap” (connect to) the Sharyland 138-kV transmission system at its Railroad Substation and continue to the Rio Grande River, the U.S.- Mexico border. At the border, the proposed transmission facilities would interconnect with similar facilities of CFE and continue 6.8 km (4.2-mile) into Mexico, where the line would terminate at CFE’s Cumbres Substation.

The majority of transmission interconnections between the electric systems of the United States and Mexico are synchronous and operated radially. Through the use of the proposed BTB-HVDC converter, the proposed transmission facilities would operate as an asynchronous connection. The BTB-HVDC converter would be constructed between Sharyland’s Railroad Substation and the border, approximately 30.5 meters (m) (100 feet [ft]) west of the Railroad Substation. The BTB-HVDC converter station would consist of a device to convert 138-kV alternating current (AC) to direct current (DC), a connecting length of DC buswork, and a device to convert the DC to 138-kV AC. Both main components of the converter station would be located within a single structure, surrounded by external peripheral gear, covering an area of approximately 30.5 m by 91.4 m (100 ft by 300 ft). Additionally, a 138-kV switchyard would be located at the converter site. The approximate footprint of the converter station would be 2.8 hectares (ha) (7 ac).

Sharyland proposes to construct the Sharyland HVDC Interconnection Project in two phases. The first phase would include construction of a single-circuit 138-kV transmission line to Mexico and a BTB-HVDC converter facility with a capacity of 150 megawatts (MW). The second phase would expand the converter facility to a capacity of 300 MW. Although the exact timing of the second phase is not certain, DOE has prepared this environmental assessment based on the full build-out of the proposed project.

1.2 PURPOSE AND NEED

Federal regulations implementing NEPA require an environmental assessment on any action at any time in order to assist agency planning and decision making.

1.2.1 Federal Agency Purpose and Need

The purpose and need for the DOE action is to determine whether it is in the public interest to grant or deny a Presidential permit to Sharyland for the construction, operation, maintenance, and connection of the proposed 138-kV transmission line that would cross the U.S. international border. DOE published a notice of receipt of the Sharyland application for a Presidential permit in the *Federal Register* on October 2, 2003 (68 FR 56825). DOE's action is in response to the applicant's request for a Presidential permit. Like all federal agencies, DOE must comply with NEPA before decisions are made and before actions are taken. The NEPA process is intended to help decision makers understand the environmental consequences of their actions.

1.2.2 Applicant's Purpose and Need

The Sharyland Plantation development consists of approximately 2,428.1 ha (6,000 ac) of contiguous land located south of, and between, the cities of McAllen and Mission, Texas. The development is adjacent to and just north of the border between the United States and Mexico. Sharyland Plantation is being developed as a planned community that contemplates a mixed property use environment with industrial, commercial, and residential areas. The ultimate electrical load is anticipated to be 350 MW. The ultimate number of electrical consumers is anticipated to reach approximately 12,000 between 2015 and 2020.

Sharyland received a Certificate of Convenience and Necessity (CCN) from the Public Utility Commission of Texas (PUC) in 1999, which authorized it to provide electrical service to Sharyland Plantation; a 138-kV transmission system is being constructed.

In recent years, electric load growth in southeast Texas (also described as the Lower Rio Grande Valley, or more simply, the Valley) has been well in excess of the average growth rate for the rest of the Electric Reliability Council of Texas (ERCOT)². At the same time, the Valley has experienced substantial transmission congestion and reliability problems because the existing 138-kV system is not adequate under contingency conditions. This has resulted in increased costs caused by the operation of certain generating units (reliability must run³ [RMR]) exclusively to support electric system reliability. Although ERCOT plans extensive improvements to the existing system over the next several years, significant congestion and reliability problems are expected to remain until ERCOT's 345-kV system is extended further south along the border.

² ERCOT is the corporation that administers the Texas power grid, and is one of ten regional reliability councils in North America. ERCOT is regulated by the Public Utility Commission of Texas and its members are comprised of retail consumers, investor and municipally owned electric utilities, electric co-ops, river authorities, independent generators, power marketers, retail electric providers and independent members.

³ ERCOT protocols define a RMR unit as a generation resource operated under the terms of an annual agreement with ERCOT that would not otherwise be operated except that they are necessary to provide voltage support, stability or management of localized transmission constraints under first contingency criteria where market solutions do not exist.

While ERCOT's planned 345-kV transmission lines are expected to eventually alleviate transmission constraints in the Laredo and Lower Rio Grande Valley areas, but these lines are not likely to be constructed before 2010. In the interim, the proposed Sharyland HVDC Interconnection Project, which is proposed to be completed by the end of 2005, would be available to alleviate reliability problems in the Valley and to provide emergency support to both the ERCOT and CFE grids. At present, there is available capacity from gas-fired, combined-cycle generation in Northern Mexico, which could be transmitted to Texas markets on an as-needed basis over the proposed HVDC interconnection. The Sharyland HVDC Interconnection Project would facilitate the creation of a power market to trade electricity between ERCOT and CFE, thus providing the opportunity for reduced prices to electric consumers in Texas and the development of a more liquid wholesale market in ERCOT.

1.3 OTHER AGENCY ACTIONS

1.3.1 U.S. Army Corps of Engineers

The construction of the transmission line across the Rio Grande would be subject to approval under Section 10 of the River and Harbors Act. A permit for the crossing must be obtained from the U.S. Army Corps of Engineers (USACE) prior to construction of the crossing. Section 10 permits are required for any activity conducted in, over, or under a navigable water of the United States. The Rio Grande has been determined, by the USACE, to be navigable for approximately 442.6 km (275 miles) inland from its mouth at the Gulf of Mexico. In addition, if fill material is placed into "waters of the United States," the project would also be subject to Section 404 of the Clean Water Act, which is also administered by the USACE.

Since the proposed transmission line would cross an international border, additional permitting requirements come into play relative to the USACE permit. The USACE regulations at 33 CFR 322.5(h) state that the construction and maintenance of electric power transmission lines across the border of the United States with a foreign country must be authorized by the President, the Secretary of State, or the appropriate delegated official. The USACE regulations further state that an application for approval must be submitted to the Secretary of Energy. The USACE regulations reference EO 10485, EO 12038, and 18 CFR 32.

1.3.2 International Boundary and Water Commission

A license from the International Boundary and Water Commission (IBWC) is required for the construction of the proposed transmission line crossing IBWC-controlled lands. The IBWC has established requirements regarding height clearances and distances of structures from the levee and river; however, the IBWC has no formalized application form. Sharyland must submit a letter requesting permission to construct the transmission line to the IBWC through its Mercedes, Texas, field office. The letter would be accompanied by drawings and plans sufficient to adequately describe the proposed project. The submittal would also include EA information which describes the potential environmental

impacts. A formal EA and coordination with other state and federal agencies may be required depending upon IBWC's evaluation of the proposed project. Sharyland provided IBWC with final design drawings for construction of the crossing of the Rio Grande identifying the River Mile at which the proposed line would intersect the main channel of the Rio Grande and a surveyed cross-section covering from the U.S. to the Mexican Levee. It is anticipated that two poles may be placed within the U.S. floodplain of the Rio Grande, and if appropriate, a hydraulic model and scour analysis will be provided.

1.3.3 Public Utility Commission of Texas

Sharyland must also submit an application for a CCN from the PUC. The application must address environmental and land use issues referenced in Section 37.056(c)(4) of the Texas Utilities Code, and PUC Rule 25.101(b)(3)(B).

1.3.4 Texas Historical Commission

The Texas Historical Commission (THC) is the state agency responsible for historic preservation. Since the proposed project requires a federal action (Presidential permit), Section 106 of the National Historic preservation Act (NHPA) requires the lead federal agency (DOE) to seek input and consultation from the State Historic Preservation Officer (SHPO). The THC has concurred with the findings of the cultural resources survey of the proposed project (letter in Appendix A).

1.3.5 U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service (FWS) is the principal federal agency responsible for conserving protecting, and enhancing fish, wildlife, and plants and their habitat. FWS is also responsible for administering the Endangered Species Act (ESA) and in this capacity will engage in informal consultation with the DOE through review and comment on this draft EA.

1.3.6 Texas Parks and Wildlife Department

The Texas Parks and Wildlife Department (TPWD) is the state agency charged with conserving and protecting the state's fish and wildlife and other natural resources, as well as administering the state's parks, natural areas, and wildlife management areas. The agency also enforces state laws and regulations dealing with the state-designated endangered or threatened species. TPWD reviewed the pre-approval EA and provide comments and recommendations to DOE. As a result, Sharyland will incorporate the use of line markers to reduce the likelihood of potential bird collisions, and will dispose of soil excavated to accommodate transmission poles in previously-disturbed upland locations.

2.0 PROPOSED ACTION AND ALTERNATIVES

The objective of this EA is to evaluate the proposed action and alternatives in accordance with NEPA. The proposed action is the issuing of a Presidential permit by DOE to allow the construction, operation, maintenance, and connection of a single-circuit, 138-kV transmission line between Sharyland's Railroad Substation and the U. S. border with Mexico. The objective of Sharyland's proposed project is to connect the transmission systems of ERCOT and CFE. There are no generation facilities to be constructed as part of the proposed action. Direct environmental effects are evaluated in this EA for the transmission facilities in the United States only.

The alternatives developed and evaluated in this EA are alternative routes to interconnect Sharyland's system with CFE's, plus a "No Action" alternative. Sharyland's initial evaluation resulted in the identification of three potentially viable corridors for transmission interconnection in the Rio Grande Valley with CFE.

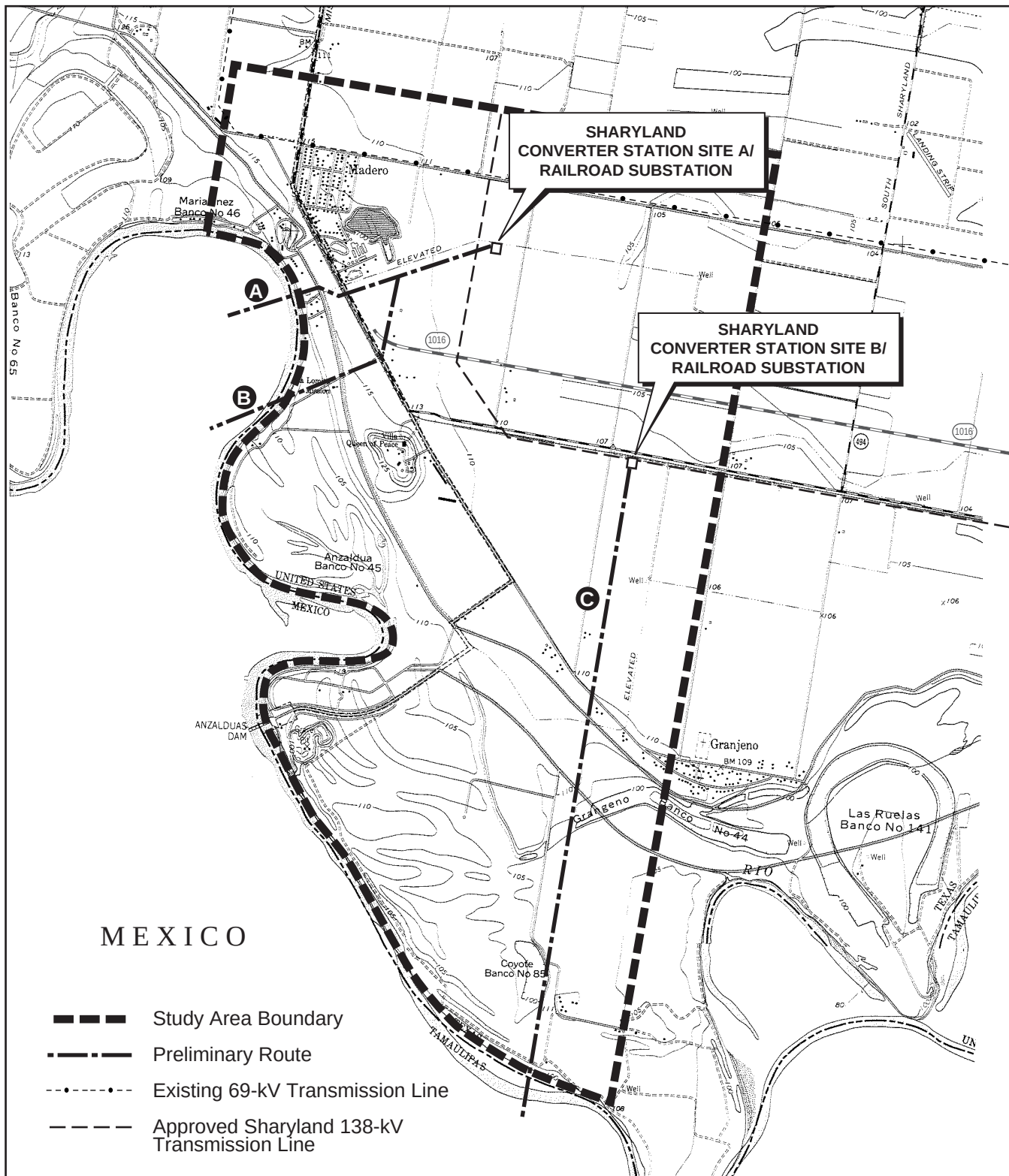
Sharyland Corridor Identification Process. In the initial phase of Sharyland's corridor identification process, it delineated a study area boundary, contacted local, state, and federal agencies and officials, reviewed existing information regarding the study area, including U.S. Geological Survey (USGS) topographic maps, Texas Department of Transportation (TxDOT) county highway maps, color aerial photography, and other published information. Sharyland then conducted a more-detailed review of the three preliminary routes (Figure 2-1), including a field reconnaissance in May 2003. This review involved an evaluation of engineering, land use, and environmental constraints in the study area.

This evaluation led to the designation of two primary alternative routes (Figure 2-2). These routes are summarized below. The primary routes, as well as some of the important land use and environmental constraints within the study area, are shown on Figure 2-3 (map pocket).

The alternatives evaluated in this EA are the construction of the proposed transmission facilities from the Railroad Substation to the international border on two alternative routes, and the No Action Alternative. A third alternative route and an alternative construction method, which were considered but rejected, are also briefly discussed below.

2.1 NO ACTION ALTERNATIVE

Under the No Action Alternative, no Presidential permit would be issued and the transmission facilities proposed by Sharyland would not be constructed. The purpose and need for the action, as defined in Section 1.2.1 of this EA, would not be realized and projected benefits to the electrical systems of both the U.S. and Mexico would not occur. Potential impacts, whether short-term or long-term, direct or indirect, project-specific or cumulative, would not occur.



north

0 2000 4000 feet



Base Map: USGS 7.5' Quadrangles; Hidalgo and Mission, Texas

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- Engineering
- Environmental Consulting
- Surveying

Figure 2-1

PRELIMINARY ALTERNATIVE ROUTES

SHARYLAND - DC MEXICO TIE PROJECT

The No Action Alternative would not preclude the construction, by other utilities in different locations, of other international transmission projects in the Lower Rio Grande Valley.

2.2 APPLICANT'S PREFERRED ALTERNATIVE (PROPOSED ACTION)

Proposed Route A (Figure 2-4, map pocket) starts at a dead-end structure located at Sharyland's "Railroad Substation" and proceeds directly into the proposed BTB-HVDC Converter Station, located 30.5 m (100 ft) to the west. The line would exit the west end of the Converter Station and proceed on steel or concrete single pole structures in a southwesterly direction paralleling the Old Edinburg Canal. The line would be constructed in the southern most 30.5-m (100-ft) right-of-way (ROW) of the existing 67.1-m (220-ft) Old Edinburg Canal, cross Farm-to-Market Road (FM) 1016 (Military Highway) and the St. Louis Brownsville and Mexico Railway, for a distance of approximately 990.6 m (3,250 ft). The line would turn an angle and travel in a west northwesterly direction in a new 30.5-m (100-ft) ROW for a distance of approximately 141.7 m (465 ft), crossing the Hidalgo County Irrigation District #19 canal and levee. At this point it would again turn an angle and travel in a southwesterly direction in a new 30.5-m (100-ft) ROW for 141.7 m (475 ft) to the center of the Rio Grande River, the U.S. border with Mexico, and continue across the border to the first structure in Mexico. The total length of this proposed route is 1,277.1 m (4,190 ft).

At this point, CFE would construct an additional 7.4 km (4.6 mi) of transmission to their existing 138-kV/400-kV Cumbres Substation.

2.2.1 Structure Alternatives

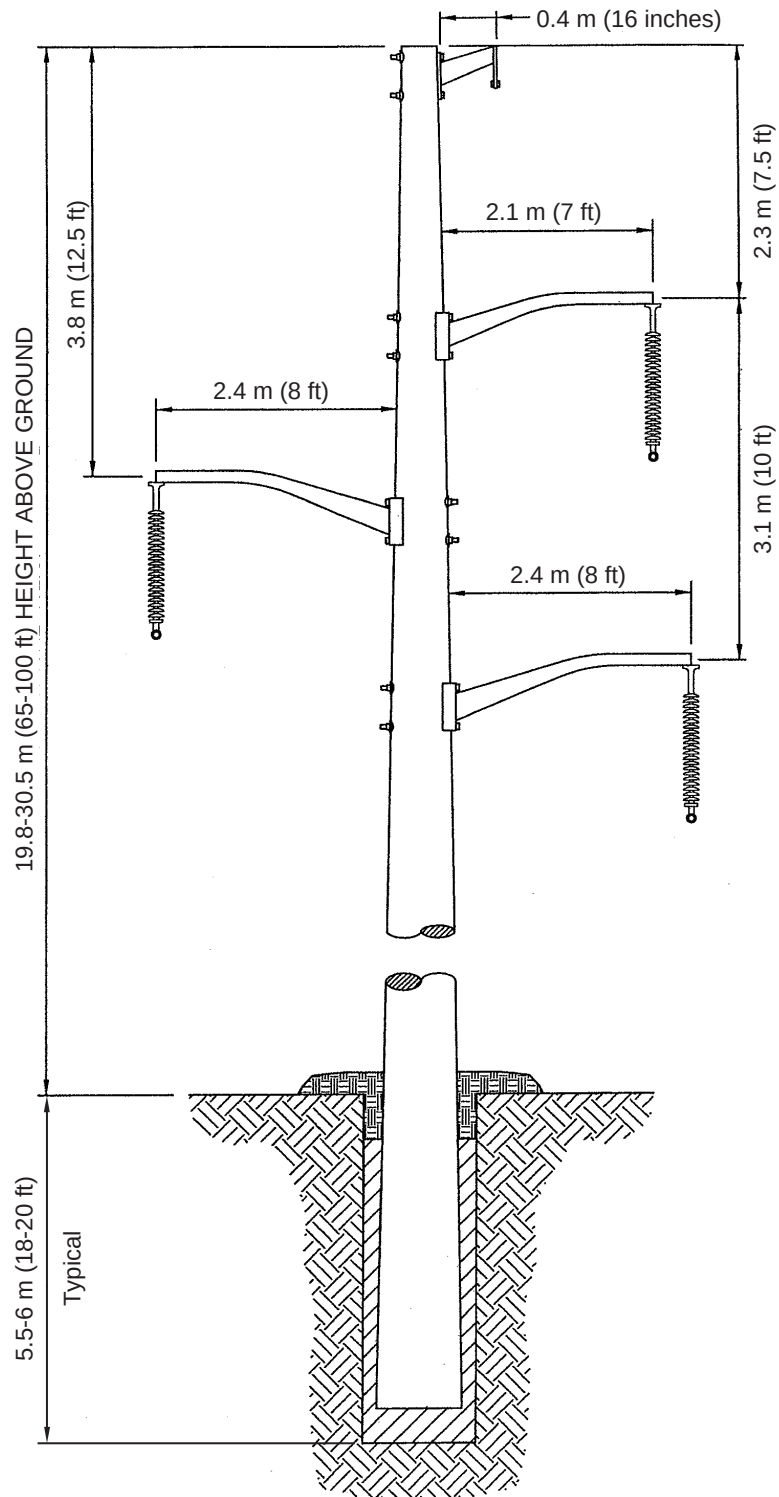
Sharyland evaluated a number of structure types for the proposed 138-kV transmission line. The primary structure types evaluated were single-pole structures, constructed of wood, concrete, or steel (Figure 2-5).

Based primarily on economic and maintenance considerations, the basic structure type selected for the proposed transmission line would be either single steel base plate or direct embedded concrete-pole structures.

The transmission line would be constructed with either direct embedded steel poles or with steel poles with concrete footers. The direct embedded poles would be embedded in the ground an average depth of 6.1 m (20 ft) with average diameter of 1.5 m (5 ft). Steel poles with concrete footers would require footers to be approximately 1.2 m (4 ft) in diameter with an average depth of 5.5 m (18 ft).

2.2.2 Transmission Line Design

The type of 138-kV construction utilized by Sharyland for the proposed transmission line would be single-circuit, on steel or concrete single-pole structures. The primary structure for single-circuit



- Engineering
- Environmental Consulting
- Surveying

Figure 2-5

TYPICAL SINGLE-CIRCUIT, 138-KV
SINGLE-POLE TANGENT STRUCTURE
SHARYLAND - DC MEXICO TIE PROJECT

Source: Sharyland Utilities, L.P.

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construction, shown in Figure 2-5, would utilize three upswept steel davit arms alternated on both sides of the pole (delta configuration), each supporting a 795 KCM 26/7 ACSS (Hawk) phase conductor on a suspension insulator string, and one 0.95-centimeter (cm) ($\frac{3}{8}$ -inch) 7-strand high-strength steel shield wire supported from an attachment at the apex of the pole. The poles would be designed for direct embedment into the ground with either a concrete foundation or steel-pole base plate. The configuration would have a basic pole height of approximately 25.9 m (85 ft) above ground level. The variation in structure height would range from a minimum of 19.8 m (65 ft) to a maximum of 30.5 m (100 ft), again depending upon variations of terrain. The single-pole line would have a ruling span of approximately 152.4 m (500 ft). Depending upon terrain and man-made factors, spans would range from approximately 121.9 to 198.1 m (400 to 650 ft).

2.2.3 Converter Station

Located adjacent to the planned Sharyland 138-kV line and along the proposed international transmission line would be the HVDC “Back-to-Back” converter station that consists of a device to convert 138-kV AC to DC, a connecting length of DC buswork, and a device to convert the DC to 138-kV AC. Both main components of the converter station would be located within a single structure surrounded by external peripheral gear covering an area of approximately 30.5 m by 91.4 m (100 ft by 300 ft). Additionally, a 138-kV switch yard would be located at the converter site. The approximate project footprint would be 2.8 ha (7 ac). The current use of this site and the surrounding area is cropland. This land is in a crop rotation program and sugar cane is currently under cultivation.

2.2.4 Construction Procedures

Bonded contractors would construct the line under the supervision of Sharyland. Access to the ROW would be from public roads and other utility ROWs unless permission is otherwise obtained from landowners, or other access routes are preferred by landowners. The access road to the converter station site would disturb approximately 0.6 ha (1.6 ac) of land. The road would be approximately 15 m (50 ft) wide with slopes and drainage, and approximately 427 m (1,400 ft) long (from the nearest public road to the site).

The majority of the area crossed by either of the proposed routes would be cleared agricultural land. However, if heavy groundcover and/or trees are encountered, bulldozers would be used to clear the trees and undergrowth. If necessary, clearing would be conducted by mechanized equipment, or by hand in any areas designated as environmentally sensitive or wetlands. Little, if any, clearing would be required for the converter station site. Additional backfill material would be brought in to raise the elevation of the foundation for proper drainage. A small amount of brush and one tree may need to be cleared along the transmission line ROW. Any construction debris would be disposed of according to local government laws and regulations. Erosion-prone areas would be seeded in order to revegetate them as quickly as possible.

2.2.5 Maintenance

Maintenance of the ROW would be conducted as required, depending on the amount of growth in the ROW. This maintenance would consist of mowing the ROW. No permanent access roads are expected to be required for construction of the proposed line, although upgrading of existing roads or construction of new temporary roads may be necessary for proposed converter station construction. Periodic inspections of the structures and line itself would be conducted to assure safety and reliability.

2.3 ALTERNATIVE ROUTE (ROUTE B)

Alternative Route B (Figure 2-4, map pocket) would start at a dead-end structure located at the Railroad Substation and proceed directly into the proposed adjacent BTB-HVDC Converter Station. The line would exit the west end of the Converter Station and proceed on steel or concrete single pole structures in a southwesterly direction paralleling the Old Edinburg Canal. The line would be constructed in the southern most 30.5-m (100-ft) ROW of the existing 67.1-m (220-ft) Old Edinburg Canal for a distance of approximately 592.8 m (1,945 ft). The line would turn an angle and travel in a southerly direction in a new 30.5-m (100-ft) ROW, cross FM 1016 (Military Highway) and the St. Louis Brownsville and Mexico Railway for a distance of approximately 524.9 m (1,722 ft). At this point it would again turn an angle and travel in a southwesterly direction in a new 30.5-m (100-ft) ROW, cross the Hidalgo County Irrigation District #19 canal and levee for 701 m (2,300 ft) to the center of the Rio Grande River and continue to the first structure in Mexico. The total length of this proposed route is approximately 1,818.7 m or 1.8 km (5,967 ft or 1.1 miles).

At this point, CFE would construct an additional 7.4 km (4.6 mi) of transmission to their existing 138-kV/400-kV Cumbres Substation.

2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER ANALYSIS

The alternative identification process resulted in a decision to eliminate one routing alternative, Alternative C (Figure 2-1), for the following reasons:

- the overall length of this route compared to the other alternatives (approximately three times longer)
- uncertainties about the exact location and design of the proposed Anzalduas Freeway and International Bridge, a new United States-Mexico port of entry, in the very narrow corridor available at the Rio Grande crossing
- the possibility that the route would have to cross a portion of the Gabrielson Unit of the Lower Rio Grande Valley National Wildlife Refuge (LRGV NWR), which would require a “compatibility determination” from the FWS, with no guarantee that a ROW would be granted.

Also eliminated was construction of buried transmission facilities. The alternative of constructing the transmission line underground was determined to be at least 10 times more expensive than the preferred overhead construction. In addition, the high water table in the area would be detrimental to underground connections, and an underground line would be more difficult to maintain.

3.0 AFFECTED ENVIRONMENT

3.1 PHYSIOGRAPHY, GEOLOGY, AIR QUALITY

As shown on Figure 3-1, the southern two-thirds of Hidalgo County (which includes the study area) is located along the U.S.-Mexico border within the Interior Coastal Plains Physiographic Province (Bureau of Economic Geology (BEG), 1996). The plain was formed during the Cenozoic Era as rivers deposited large volumes of sediment into the deltas of the Gulf of Mexico (Swanson, 1995). The topography is very flat, with elevations ranging between 30.5 m and 33.5 m (100 and 110 ft) above mean sea level (MSL) over most of the study area. A small hill (La Lomita) located along FM 494 rises to approximately 41.1 m (135 ft) MSL.

Study area bedrock geology consists of Quaternary-aged Alluvium and the Tertiary-aged Goliad Formation. Recent alluvial deposits underlie the majority of the study area. These alluvial materials consist of floodplain deposits associated with the Rio Grande and include mud, silts, and sands (BEG, 1976). The Goliad Formation consists of clay, sand, sandstone, marl, caliche, limestone, and conglomerate and reaches a thickness of up to 182.8 m (600 ft) (BEG, 1976).

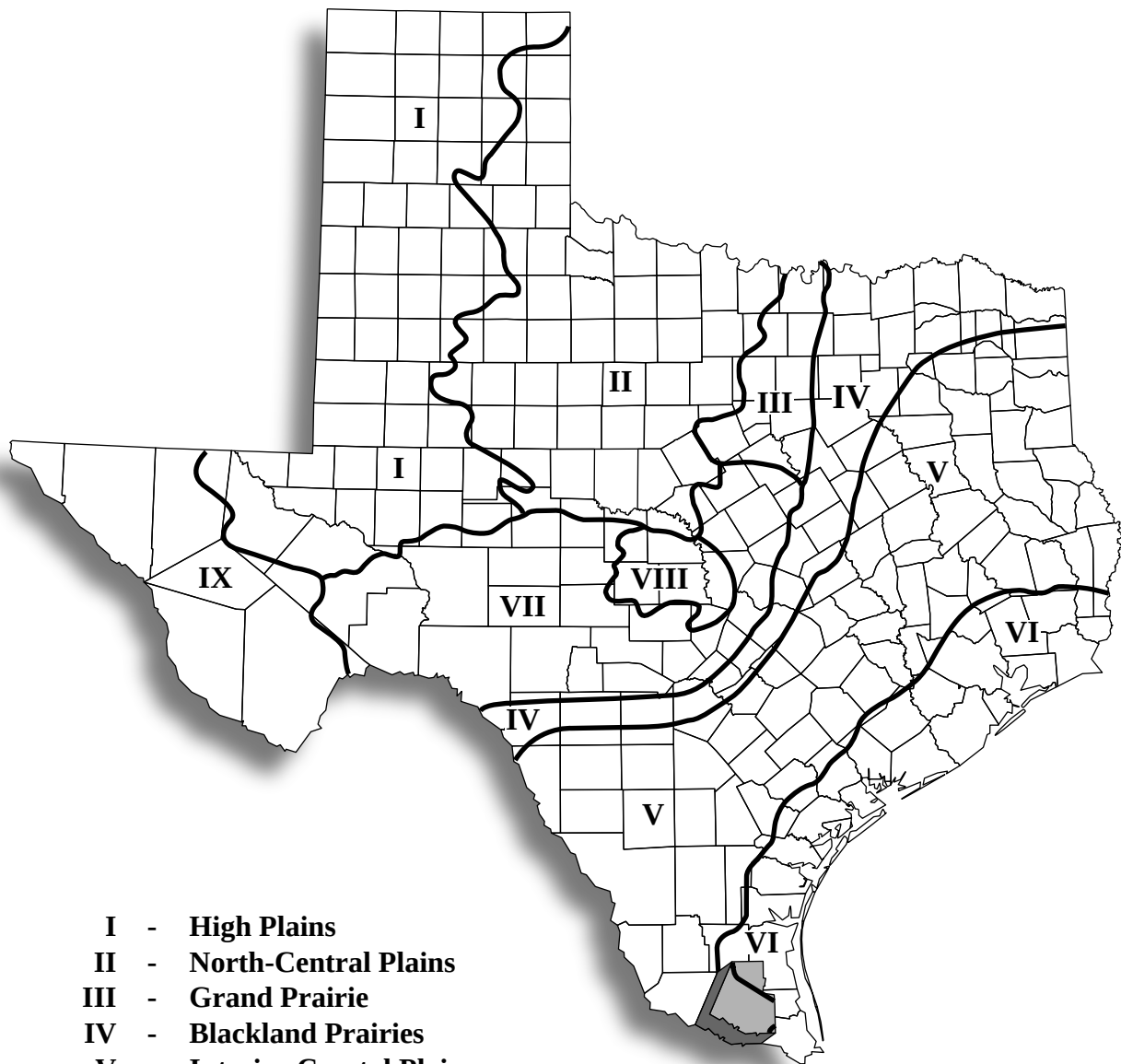
The Clean Air Act, which was last amended in 1990, requires the U.S. Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The Clean Air Act established two types of national air quality standards:

- Primary standards set limits to protect public health, including the health of “sensitive” populations such as asthmatics, children, and the elderly.
- Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

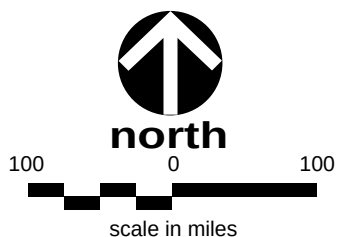
The EPA Office of Air Quality Planning and Standards has set NAAQS for six principal pollutants that are called “criteria” pollutants. They are carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), lead (Pb), particulate matter (PM), and sulfur dioxide (SO₂). Particulate matter has been further divided into particulate matter with particle diameters of 10 micrometers or less (PM₁₀) and particulate matter with particle diameters of 2.5 micrometers or less (PM_{2.5}). Air quality is generally considered acceptable if pollutant levels are less than or equal to these established standards on a continuous basis.

The Clean Air Act also requires EPA to assign a designation to each area of the U.S. regarding compliance with the NAAQS. EPA categorizes the level of compliance or noncompliance as follows:

1. Attainment - area currently meets the NAAQS
2. Maintenance - area currently meets the NAAQS, but has previously been out of compliance
3. Nonattainment - area currently does not meet the NAAQS



- I - High Plains**
- II - North-Central Plains**
- III - Grand Prairie**
- IV - Blackland Prairies**
- V - Interior Coastal Plains**
- VI - Gulf Coastal Prairies**
- VII - Edwards Plateau**
- VIII - Central Texas Uplift**
- IX - Trans-Pecos Basin & Range**



Source: BEG, 1996



- Engineering
- Environmental Consulting
- Surveying

Figure 3-1

LOCATION OF HIDALGO COUNTY
IN RELATION TO THE
PHYSIOGRAPHIC PROVINCES OF TEXAS
SHARYLAND - DC MEXICO TIE PROJECT

Hidalgo County is in a region of South Texas known as the Brownsville-Laredo Intrastate Air Quality Control Region. This region includes Cameron, Hidalgo, Jim Hogg, Starr, Webb, Willacy, and Zapata counties. The air quality emissions from Hidalgo County include those from non-road mobile air emission sources associated with agriculture and construction, oil and gas production, cotton seed mills, surface coating operations, and other light industry; Hidalgo County is considered to be in an EPA designated attainment area.

The Texas Commission on Environmental Quality (TCEQ) is responsible for monitoring air quality within the state and for reporting that information to the EPA and the public. The staff examines and interprets the causes, nature, and behavior of air pollution in Texas. The TCEQ operates two air quality monitors within Hidalgo County and one in Cameron County. The air contaminants being monitored include CO, O₃, PM₁₀, and PM_{2.5} in the ambient air along with parameters such as air, temperature, wind velocity, and other meteorological data. The results of these monitoring data show the region currently meets the NAAQS for all criteria pollutants.

3.2 WATER RESOURCES

3.2.1 Surface Water

The study area is located within the Rio Grande and Nueces-Rio Grande Coastal drainage basins (Texas Water Development Board (TWDB), 1997). The portion of the study area between the main levee and the river itself is the only part that actually drains to the Rio Grande. The remainder of the study area is in the Nueces-Rio Grande basin, and drains east via a network of man-made drainage ditches, floodways, and the Arroyo Colorado, all the way to the Laguna Madre estuary on the gulf coast (TWDB, 1997). Although approximately 315.4 km (196 miles) of the Rio Grande is designated as a Wild and Scenic River, that segment is several hundred kilometers upstream of the study area, in far west Texas.

Historically, the Rio Grande and its tributaries have experienced severe flooding problems associated with heavy rains, inadequate drainage, and hurricanes. The completion of Amistad and Falcon reservoirs on the river upstream of the study area, and construction of floodway diversion channels, have lessened the effect of floodwater and created a more uniform flow through the Lower Rio Grande Valley. Anzalduas Dam is operated by the IBWC and is used to divert floodwaters from the Rio Grande into the Hackney Lake Inlet (or Banker Floodway), divert irrigation water into a canal on the Mexican side of the river, and to regulate water flows for downstream users on both sides of the border. Other than the Rio Grande, there are virtually no natural drainage features in the study area, and most surface water occurs in the numerous drainage/irrigation ditches.

A detailed floodplain analysis was conducted for Hidalgo County by the Federal Emergency Management Agency (FEMA) in 1982(a); for the City of Mission in 1991; and for the City of McAllen in 1982(b). The resulting Flood Insurance Rate Maps were used to review the limits of the 100-year floodplain within the study area. Based on the FEMA studies, the portion of the study area located between the north levee and

the Rio Grande is within the 100-year floodplain associated with the Rio Grande. There are also depressional land features scattered throughout the study area which fall within the 100-year floodplain.

EO 11988 (Floodplain Management) generally discourages federal construction activities in floodplains. Agencies are required to evaluate the potential effects of any actions it may take in a floodplain. This process ensures that planning programs and budget requests reflect considerations of flood hazards and floodplain management and prescribes procedures to implement the policies and requirements of this order.

3.2.2 Wetlands/Jurisdictional Waters of the U.S.

Waters of the U.S., which are regulated by the USACE under Section 404 of the Clean Water Act include, but are not limited to, territorial seas, lakes, rivers, streams, oceans, bays, ponds, and other special aquatic features including wetlands. The USACE uses the regulatory term “ordinary high water mark” in describing the jurisdictional portion of a stream. This term refers to the established line on the bank or shore indicated by the fluctuation of water (an average width is determined). Wetlands have been defined in a broad sense as transitional areas (ecotones) between terrestrial and aquatic systems where the water table is usually at or near the ground surface, or the land is covered by shallow water (Cowardin et al., 1979). Under normal circumstances, wetlands are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of hydrophytic vegetation that is typically adapted to living in saturated soil conditions. Wetlands contain a predominance of hydrophytic vegetation, have hydric soils or hydric soil indicators, and show evidence of wetland hydrology. Wetlands generally include bogs, seeps, marshes, swamps, forested bottomland wetlands, and other similar areas (USACE, 1987).

EO 11990 (Protection of Wetlands) requires that government agencies avoid construction in wetlands unless there are no practical alternatives and unless all practicable measures to minimize harm to wetlands are included in the program.

Wetlands in the study area and vicinity have been mapped by the FWS in their National Wetlands Inventory (NWI) program. Several palustrine features, the majority of which are excavated semipermanently flooded water bodies, are located between the Rio Grande and the north levee, in the southwestern portion of the study area. A relatively large surface water feature is located on the southeast side of the community of Madero, in the southwestern corner of the study area. The approximately 7-ha (17.2-ac) feature is roughly 167.6 m (550 ft) north of the applicant’s preferred route. The Rio Grande is identified as a riverine feature. These wetlands are located on Figure 2-3 (map pocket).

3.2.3 Groundwater

Groundwater provides only limited amounts of water to the supplies of the Lower Rio Grande Valley. Over 97 percent (%) of water needs are supplied by surface water, groundwater being utilized primarily when surface water is in short supply during drought periods (TWDB, 1990).

The Gulf Coast Aquifer underlies nearly the entire Nueces-Rio Grande Coastal Basin. In the eastern part of the basin, saline water overlies fresh water supplies (TWDB, 1997). Two subsurface aquifers provide most of the groundwater resources within Hidalgo County. These are the Evangeline and Chicot aquifers. The approximate depth to groundwater in the study area is 3.1–4.6 m (10–15 ft) below ground surface (TWDB, 1990).

3.3 SOILS

3.3.1 Soil Associations

Two general soil associations occupy the study area, containing more than 15 separate soil types described by the Soil Conservation Service (SCS [now the Natural Resources Conservation Service (NRCS)], 1981). These soil associations are the Harlingen-Runn-Reynosa and the Rio Grande-Matamoros.

The Harlingen-Runn-Reynosa Association is nearly level and typically found on terraces. Harlingen soils make up approximately 55% of the unit and Runn and Reynosa soils make up 27% and 10% of the unit, respectively. Benito, Cameron, Laredo, and Olmito soils make up the remaining 8% of this unit. This soil association is described as having deep, very slowly to slowly and moderately permeable soils that are moderately well drained. They typically have grayish brown clays, silty clays, and silty clay loams in the surface layer.

The Rio Grande-Matamoros Association, located in the southern portion of the study area, consists of nearly level soils on bottomlands. Rio Grande soils make up about 42% of the unit, Matamoros soils make up about 24% of the unit, and Camargo, Grulla, and Zalla soils make up the remaining 34%. This soil association is described as containing deep, moderately to slowly permeable soils that typically have a light brownish or grayish-brown silt loam or silty clay surface layer. These soils are used mostly as irrigated cropland.

3.3.2 Prime Farmland

Prime farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, or oilseed (7 U.S.C. 4201(c)(1)(A)). Approximately 59% of Hidalgo County soils are considered prime farmland in their native state, while an additional 11–20% of the county's soils are considered potential prime farmland, if irrigated (SCS, 1979).

Within the study area, approximately 85% of the land may be considered prime farmland either in its native state or if irrigated. The majority of soils that are not considered prime farmlands are so classified because of salinity problems or development.

Harlingen-Runn-Reynosa soils have a medium potential for croplands on non-irrigated soils and a high potential on irrigated soils. These soils have a low potential for citrus, medium potential for vegetables, and a high potential for rangeland. Rio Grande-Matamoros soils have a medium potential for non-irrigated crops, and high potential for irrigated crops.

3.4 VEGETATION

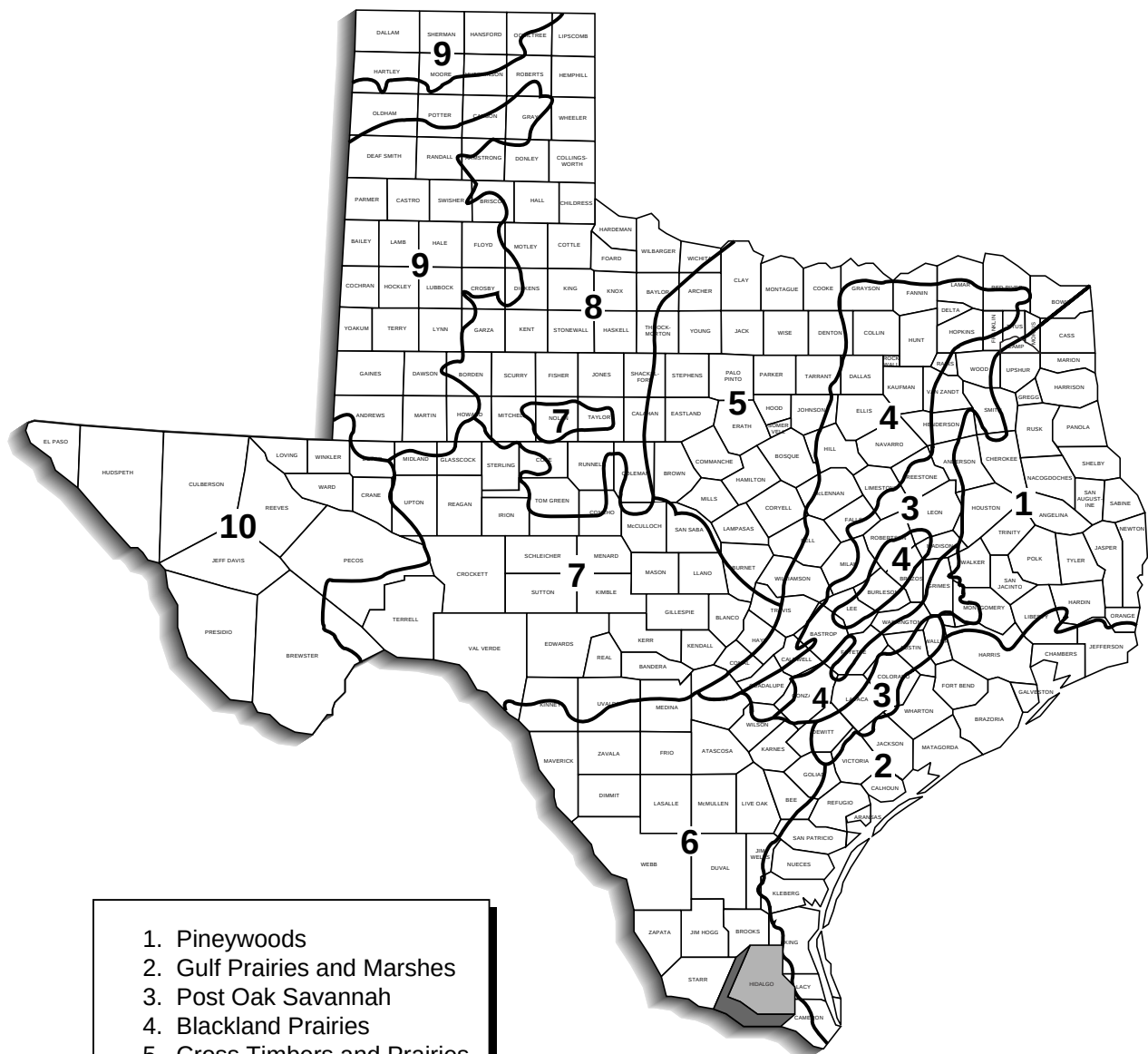
3.4.1 Regional Vegetation

As shown on Figure 3-2, Hidalgo County lies within the South Texas Plains vegetational area as delineated by Hatch et al. (1990). The South Texas Plains includes approximately 8,093,725 ha (20,000,000 ac) of level to rolling land dissected by streams flowing to the Gulf of Mexico. Elevations range from sea level to approximately 304.8 m (1,000 ft) above MSL. Average annual precipitation ranges from 40.6 to 88.9 cm (16 to 35 inches), occurring mostly in the spring and fall. Summers are often characterized by drought conditions that are frequently of sufficient duration to depress crop growth.

The South Texas Plains vegetation area approximates the Tamaulipan Biotic Province of Texas (Blair, 1950). Blair further describes the Lower Rio Grande Valley (Starr, Hidalgo, Cameron, and Willacy counties) as a distinct biotic district (the Matamoran) within the Tamaulipan Biotic Province (Blair, 1952). Thorny brush is the dominant vegetation type in the Matamoran District. The Matamoran District has poorer drainage and more-luxuriant vegetation than northern portions of the Tamaulipan Biotic Province.

Climate, edaphic factors, and past human activity have influenced the vegetation of the Lower Rio Grande Valley, resulting in a shrubland climax of mixed-brush and acacia associations. The unique ecology of the Lower Rio Grande Valley is characterized by a combination of climate, vegetation, and wildlife associations unlike anywhere else in the U.S. (Jahrsdoerfer and Leslie, 1988). Plants with western desert, northern, coastal, and tropical affinities comprise the vegetation community of the region. Historically, the Tamaulipan brushland was characterized by two vegetation communities, mesquital and chaparral.

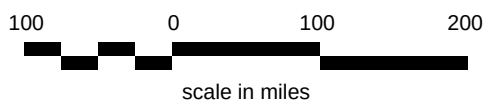
Two general types of brush habitat are currently predominant in the Lower Rio Grande Valley: riparian and scrub forests, and upland thornscrub and thorn woodlands (Jahrsdoerfer and Leslie, 1988). Riparian and scrub forests are associated with the Rio Grande and consist of several intergrading habitat types of taller stature than adjacent vegetation communities. These areas are particularly important to wildlife as they provide habitat corridors throughout the Lower Rio Grande Valley. Upland woodlands represent the most extensive brushland habitat remaining in the Lower Rio Grande Valley. Upland sites are intersected



1. Pineywoods
2. Gulf Prairies and Marshes
3. Post Oak Savannah
4. Blackland Prairies
5. Cross Timbers and Prairies
6. South Texas Plains
7. Edwards Plateau
8. Rolling Plains
9. High Plains
10. Trans-Pecos



north



scale in miles



- Engineering
- Environmental Consulting
- Surveying

Figure 3-2

LOCATION OF HIDALGO COUNTY
IN RELATION TO THE
VEGETATIONAL AREAS OF TEXAS
SHARYLAND - DC MEXICO TIE PROJECT

Source: Hatch et al., 1990

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by dense riparian strips (ramaderos) that provide important nesting and foraging habitat for wildlife and access to habitat along the Rio Grande.

The FWS further delimits the vegetation of the region, identifying brush woodland community types. Hidalgo County north of the Rio Grande floodplain is described as the mid-Delta Thorn Forest Community (FWS, 1985). This community contains a mixture of honey mesquite (*Prosopis glandulosa*) and granjeno (*Celtis pallida*) mixed with Texas ebony (*Pithecellobium flexicaule*), anacua (*Ehretia anacua*), and brasil (*Condalia hookeri*). Less than 5% of this once-extensive community remains, and remnant tracts are generally restricted to 40.5 ha (100 ac) or less and are scattered in distribution (Jahrsdoerfer and Leslie, 1988).

3.4.2 Vegetation Community Types in the Study Area

The vegetation in the study area consists of a mixture of agricultural crops and native brushlands, woodlands, and grasslands. Agricultural crops include food, forage, and fiber crops, with cotton, grain sorghum, sugar cane, and citrus being of primary importance. The portion of the study area north of the floodway levee consists primarily of agricultural crops, with some native plant communities present in scattered tracts, typically in federal preserves, along drainage ditches and canals, and along the perimeters of cultivated fields. Native plant communities within the study area include riparian and scrub forests, and upland thornscrub and thorn woodlands. Riparian and scrub forests are associated with the Rio Grande and consist of several intergrading habitat types of taller stature than adjacent vegetation communities. Upland thornscrub and thorn woodlands represent the most extensive brushland habitat remaining in the Lower Rio Grande Valley. These native communities typically consist of a mixture of trees and shrubs including, but not limited to, honey mesquite, granjeno, Texas ebony, anacua, and brasil. In the study area these communities are limited to several tracts of the LRGV NWR along the Rio Grande, the La Lomita National Register Historic District, and several smaller, undeveloped tracts amidst the agricultural areas.

3.4.3 Important Species

Important species are those that (a) are commercially or recreationally valuable; (b) are endangered or threatened; (c) affect the well-being of some important species within criterion (a) or criterion (b); or (d) are critical to the structure and function of the ecological system or are biological indicators.

The study area lies in the Lower Rio Grande Valley of Texas, one of the state's major crop-producing regions. Agriculture in Hidalgo County is of major importance with cotton, grain sorghum, corn, cool-season vegetables, and citrus being the most important crops (Texas Agricultural Statistics Service (TASS), 1997). Bell peppers, tomatoes, melons, and cucumbers are also produced. None of the soil map units in the study area is classified as a native range site, although most are potentially suitable for pastureland or hay crops. Varieties of bermudagrass and introduced bluestems are the usual forage crops on grazingland in Hidalgo County.

Several shrub and tree species provide browse and cover for wildlife and domestic livestock. Texas kidneywood (*Eysenhardtia texana*) and vine ephedra (*Ephedra antisiphilitica*), are among woody plants eaten by cattle and white-tailed deer (*Odocoileus virginianus*). Anacua, huisache (*Acacia smallii*), Texas ebony, brasil, and spiny hackberry provide nesting habitat for the white-winged dove (*Zenaida asiatica*).

Information was obtained from the Texas Biological and Conservation Data System (TXBCD) concerning the occurrence and location of state and federally listed plant species in the vicinity of the project. The official state list of endangered and threatened plant species promulgated by the TPWD includes the same species listed by the FWS as endangered or threatened. Currently, 30 plant species are listed by the FWS as endangered or threatened in Texas (FWS, 2002a). The FWS and the TPWD have identified three state and federally listed endangered plant species as potentially occurring in Hidalgo County (Table 3-1). These are the star cactus (*Astrophytum asterias*), Texas ayenia (*Ayenia limitaris*), and Walker's manioc (*Manihot walkerae*). Of these, only Walker's manioc has been recorded within the study area.

Star cactus grows on sparsely vegetated areas in gravelly, saline clays or loams at low elevations in the Rio Grande Plains. Historically, the star cactus occurred in Starr, Hidalgo, and Cameron counties; however, it is currently known in the U.S. from only one location in Starr County and is found in semi-arid grassland and open thornscrub (FWS, 1995; Janssen, 1998). Star cactus flowers from March through May.

Texas ayenia occurred historically in Hidalgo and Cameron counties. It is currently known in the U.S. from a single population in Hidalgo County (Janssen, 1998). This population is located approximately 35.9 km (22.3 miles) east of the study area near the City of Progreso. Previously found in openings in chaparral and edges of thickets, the known location is a Texas Ebony-Anacua plant community on well-drained but heavy soils on riparian terraces.

Walker's manioc, known historically from Starr and Hidalgo counties in the U.S., is near extinction. Until recently, only one natural population (consisting of one plant) was known to occur in the U.S., and that was in Hidalgo County (FWS, 1993). However, four other populations have since been discovered: three in Hidalgo County and one in Starr County (Janssen, 1995, 1998). Recorded habitat descriptions from collections of the species vary from brush to grasslands (within the protection of brush), and sandy loam soils overlying caliche (Poole and Riskind, 1987). One recently discovered population in Hidalgo County occurs in highway ROW just north of La Joya (Janssen, 1998). According to TXBCD (2003), a historic record of Walker's manioc may be located adjacent to Alternative B, between the Rio Grande and the north levee, but the accuracy of this location is questionable (i.e., may be within 2 km (1.2 miles) of mapped location).

Six plant species of potential occurrence in the study area are considered species of concern (SOC). These species are Texas windmillgrass (*Chloris texensis*), small papillous (*Echinocereus papillosus* var.

TABLE 3-1

ENDANGERED, THREATENED, OR RARE PLANT SPECIES
OF POTENTIAL OCCURRENCE IN HIDALGO COUNTY

Scientific Name ¹	Common Name ²	Status ³		Habitat ⁴	Counties of Known Distribution ⁴
		FWS	TXBCD		
<i>Astrophytum asterias</i>	Star cactus	E	E	Grasslands and brushlands in partial shade in gravelly clays and loams	Cameron, Hidalgo (H), and Starr counties; Nuevo Leon and Tamaulipas, Mexico
<i>Ayenia limitaris</i>	Texas ayenia	E	E	Mixed evergreen/deciduous woodlands in alluvial deposits on floodplains and terraces along the Rio Grande; in sandy clay loam	Cameron and Hidalgo counties; Coahuila and Tamaulipas, Mexico
<i>Chloris texensis</i>	Texas windmill-grass	SOC	NL	Sandy to sandy loam soils in coastal prairies	Brazoria, Brazos (H), Chambers, Galveston, Harris, Hidalgo (?), Nueces and Refugio counties
<i>Echinocereus papillosus</i> var. <i>angusticeps</i>	Small papillosus	SOC	NL	Sandy to gravelly soils in grasslands or mesquite-acacia shrublands	Hidalgo (H), Jim Hogg (?) and Starr counties
<i>Justicia runyonii</i>	Runyon's water-willow	SOC	NL	In brush and subtropical woodland margins on floodplains in calcareous silt loam, silty clay and clay soils	Brazoria (?), Cameron, Goliad (?) and Hidalgo counties; Tamaulipas, Mexico
<i>Manfreda longiflora</i>	Runyon huaco	SOC	NL	Thornland on terraces, slopes, and hills in Rio Grande Valley	Cameron (H), Hidalgo and Starr counties; Tamaulipas, Mexico
<i>Manihot walkerae</i>	Walker's manioc	E	E	Thorny shrubland on sandy loam soils on ridges or grasslands	Hidalgo and Starr counties; Tamaulipas, Mexico
<i>Matelea radiata</i>	Falfurrias (milkvine) anglepod	SOC	NL	Clay soils and dry gravelly hills	Brooks (H) and Hidalgo (H) counties
<i>Tillandsia baileyi</i>	Bailey's ballmoss	SOC	NL	Epiphytic on trees and shrubs in brushlands and subtropical woodlands	Brooks (H), Cameron, Hidalgo, Jim Wells, Kenedy, and Willacy counties; Tamaulipas, Mexico

¹According to Correll and Johnston (1979).

²According to FWS (2002a).

³Status according to FWS (2002a); (TXBCD, 2003).

⁴According to Poole and Carr (1997), and Correll and Johnston (1979).

FWS – U.S. Fish and Wildlife Service.

TPWD – Texas Parks and Wildlife Department.

TXBCD – Texas Biological and Conservation Data System.

TOES – Texas Organization for Endangered Species.

E – Listed as endangered (in danger of extinction).

SOC – Species of Concern. A species for which some evidence of vulnerability exists, but not enough to support listing at the present time.

NL – Not listed.

H – Historical in Texas, having not been verified in the past 50 years.

angusticeps), Runyon's water-willow (*Justicia runyonii*), Runyon huaco (*Manfreda longiflora*), Falfurrias anglepod (*Matelea radiata*), and Bailey's ballmoss (*Tillandsia baileyi*). SOC have no legal protection under the Endangered Species Act (ESA).

Texas windmill-grass is an endemic perennial grass that occurs on sandy to sandy loam soils in open to barren areas in prairies, grasslands, ditches, and roadsides from southeast Texas south to the Rio Grande (Correll and Johnston, 1979; TXBCD, 2002). Texas windmill-grass flowers from October through November.

The small papillosus is a columnar cactus that occurs in sandy to gravelly soils in grasslands and mesquite-acacia shrublands (Weniger, 1988, TXBCD, 2002). Small papillosus is an endemic species, occurring only in northern Hidalgo County.

Runyon's water-willow is a woody perennial that occurs in calcareous silt loam, silty clay, or clay soils in openings in subtropical woodlands located on active or historic floodplains (Correll and Johnston, 1979; TXBCD, 2002). The species has been recorded in Cameron and Hidalgo counties, with possible records from Brazoria and Goliad counties (TXBCD, n.d.). It is commonly associated with sedge species (*Cyperus* spp.) and flowers from September through November (TXBCD, 2002).

Runyon huaco, also known as St. Joseph's staff, is an endemic perennial aloe that inhabits openings in thorny shrublands on clay and loam soils with varying concentrations of salt, caliche, sand, and gravel (TXBCD, 2003). The species typically occurs on soils overlying the Catahoula and Frio formations, but may also occur on Rio Grande floodplain alluvial deposits. It has been recorded in Hidalgo and Starr counties, with unconfirmed reports from Jim Hogg and Cameron counties. There are only four known populations, consisting of approximately 60 plants, within 17.7 km (11 miles) of each other in the Los Olmos Creek drainage area in Starr County (Damude and Poole, 1990). Runyon huaco flowers in September (TXBCD, 2002).

Falfurrias anglepod, also known as Falfurrias milkvine, is an endemic vine that was previously known only from one collection from Falfurrias. A second record from Starr County was labeled erroneously, and is actually from Hidalgo County (TXBCD, n.d.). The species' known range includes Brooks and Hidalgo counties, and possibly Starr County (TXBCD, n.d.). Little is known about the species and its preferred habitat is unknown. Falfurrias anglepod is thought to flower from May through June (TXBCD, 2002).

Bailey's ballmoss is epiphytic on various trees and shrubs (honey mesquite, *Quercus* spp., and Texas ebony) in South Texas brushlands and in evergreen subtropical woodland in the Lower Rio Grande Valley (TXBCD, n.d.). Flowering occurs from February to May (TXBCD, 2002).

3.4.4 Ecologically Sensitive Areas

Approximately 95% of the original native brushland in the Lower Rio Grande Valley has been converted to agricultural or urban use since the 1920s and more than 90% of the riparian woodland on the U.S. side has been cleared (Jahrsdoerfer and Leslie, 1988). Remnant patches of native brushland and mid-valley riparian woodland are found within the study area, and should be considered sensitive because of their rarity, unique character (these communities are found nowhere else in the U.S.), and potential for providing habitat for some endangered, threatened, or rare plant and animal species.

Sensitive natural communities identified by the TXBCD (2003) as occurring within the study area include the Texas ebony-anacua series.

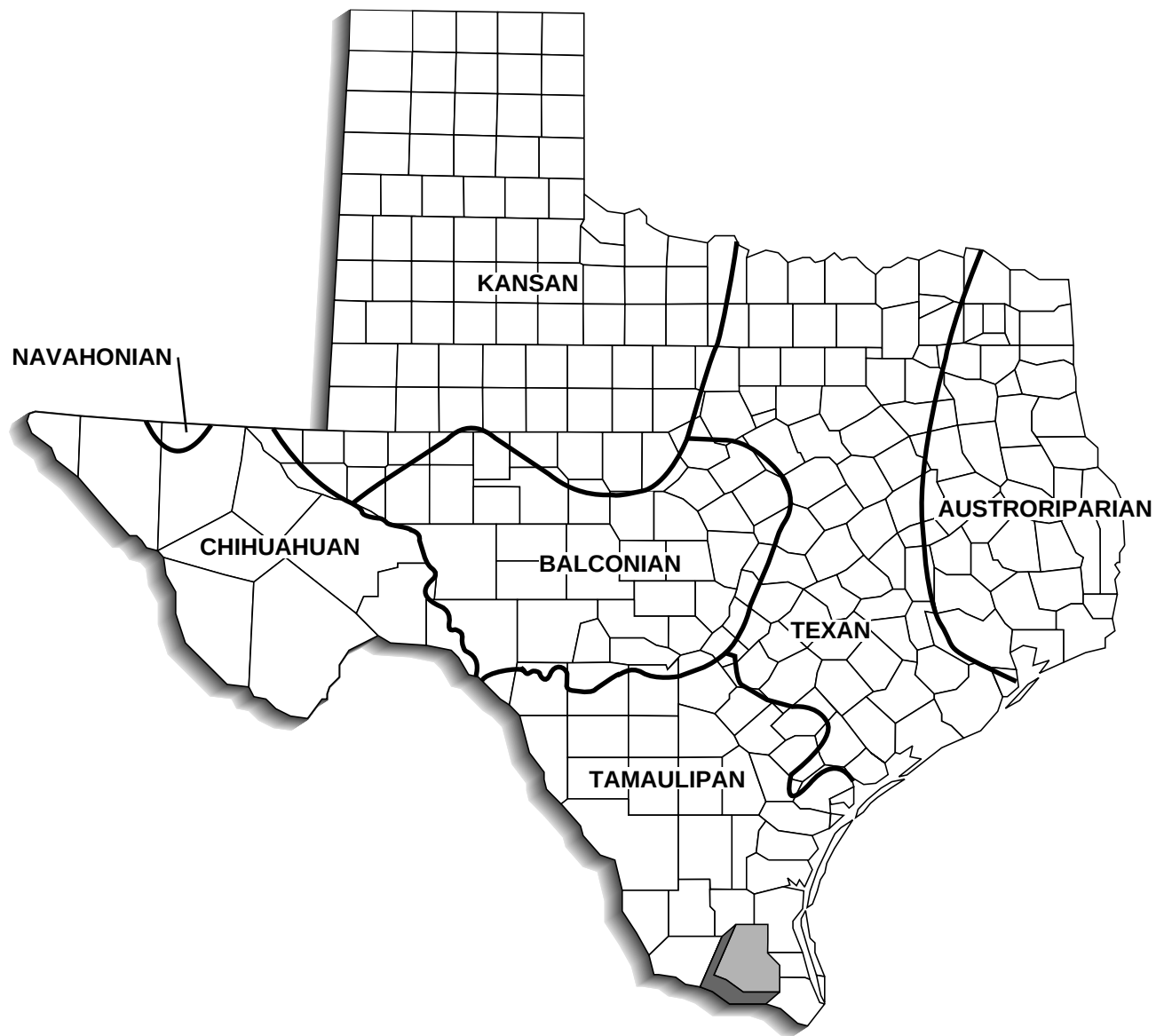
The Texas ebony-anacua series is an evergreen subtropical forest community that occurs mainly on well drained river or resaca terraces in the Lower Rio Grande Valley. Snake-eyes (*Phaulothamnus spinescens*), coma (*Bumelia celastrina*), colima (*Zanthoxylum fagara*), brasil, lotebush, and honey mesquite are typical plants of this vegetation series.

Although these communities are not normally considered rare, because of extensive past agricultural clearing activities in the Lower Rio Grande Valley, virtually any native woodland or brushland type merits consideration as a rare vegetation community.

3.5 WILDLIFE

Blair (1950) delineated seven biotic provinces in Texas. Hidalgo County falls within the subtropical, semi-arid Tamaulipan Biotic Province, as illustrated in Figure 3-3. Thornscrub woodland is the dominant natural plant community type within this province (Blair, 1950); however, less than 5% of the mid-delta thornscrub component of the Tamaulipan Biotic Province remains (Jahrsdoerfer and Leslie, 1988). Within this province, Blair designates the Lower Rio Grande Basin (Starr, Hidalgo, Cameron, and Willacy counties) as the Matamorán District in contrast to the Nuecían District to the north, based on drainage, floral and, to some extent, faunal differences (Blair, 1950, 1952). The eastern coastal areas of the Tamaulipan Biotic Province are within the Gulf Prairies and Marshes vegetational area. The regional fauna contains coastal as well as typical inland species.

The fauna of the Tamaulipan Biotic Province includes numerous neotropical species, numerous grassland species that also range north of the province, some Austroriparian species from the east, and a small number of Chihuahuan species from the west (Blair, 1950, 1952). Numerous neotropical invertebrates and vertebrates are limited in their U.S. distribution to the Tamaulipan Biotic Province, and many are found within the U.S. only in the Lower Rio Grande Valley.



Source: Blair, 1950

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- Engineering
- Environmental Consulting
- Surveying

Figure 3-3

LOCATION OF HIDALGO COUNTY
IN RELATION TO THE
BIOTIC PROVINCES OF TEXAS
SHARYLAND - DC MEXICO TIE PROJECT

3.5.1 Wildlife Habitats and Species

The wildlife habitat types in the study area largely correspond to vegetation types described in Section 3.4. These habitat types include grassland (including pasture), brushland, riparian, hydric and aquatic areas, agricultural, and residential.

The study area is predominantly agricultural land, much of it intensively farmed, so wildlife inhabiting the study area generally consists of species adapted to fields, field margins and cropland/pastureland. In general, the wildlife expected to occur in the study area is typical for the general area. No species is considered endemic to the study area. Characteristic species of the area are discussed below. Relict wooded and brushland habitat is limited in extent and found along fencerows and irrigation ditches.

3.5.1.1 Amphibians

According to Blair (1950), the Tamaulipan Biotic Province supports three urodele (salamander) species, one of which, the black-spotted newt (*Notophthalmus meridionalis*) is endemic to the region. The other two species are the Rio Grande lesser siren (*Siren intermedia texana*) and the barred tiger salamander (*Ambystoma tigrinum mavortium*). Sixteen anuran species (frogs and toads) have been recorded from Hidalgo County (Dixon, 2000). Several genera are represented, including spadefoots (*Scaphiopus* spp.), chorus frogs (*Pseudacris* spp.), true toads (*Bufo* spp.), and true frogs (*Rana* spp.).

3.5.1.2 Reptiles

Six freshwater/terrestrial turtle species have been recorded in Hidalgo County. These are the yellow mud turtle (*Kinosternon flavescens*), Rio Grande river cooter (*Pseudemys gorzugi*), red-eared slider (*Trachemys scripta elegans*), Texas spiny softshell turtle (*Apalone spinifera emoryi*), ornate box turtle (*Terrapene ornata ornata*), and Texas tortoise (*Gopherus berlandieri*). Several of these species may occur in the study area. The American alligator (*Alligator mississippiensis*) has also been recorded from Hidalgo County.

At least 19 species of lizards and 36 species of snakes occur in the Tamaulipan Biotic Province (Blair, 1950) and 18 lizard and 28 snake species have been recorded from Hidalgo County. Common lizards include whiptails (*Cnemidophorus* spp.), skinks (*Eumeces* spp.), the green anole (*Anolis carolinensis*), and Mediterranean gecko (*Hemidactylus turcicus*). Snakes include rat snakes (*Elaphe* spp.), water snakes (*Nerodia* spp.), and venomous species such as the western diamondback rattlesnake (*Crotalus atrox*) and Texas coral snake (*Micrurus tener*).

3.5.1.3 Birds

The study area region supports an abundant and diverse avifauna. Species that are of potential occurrence in the study area include year-round residents such as the great blue heron (*Ardea herodias*), snowy egret

(*Egretta thula*), turkey vulture (*Carthartes aura*), white-tailed kite (*Elanus forficatus*), Harris's hawk (*Parabuteo unicinctus*), northern bobwhite (*Colinus virginianus*), American coot (*Fulica americana*), killdeer (*Charadrius vociferus*), laughing gull (*Larus atricilla*), rock dove (*Columba livia*), mourning dove (*Zenaida macroura*), inca dove (*Columbina inca*), common ground-dove (*Columbina passerina*), white-tipped dove (*Leptotila verreauxi*), greater roadrunner (*Geococcyx californianus*), groove-billed ani (*Crotophaga sulcirostris*), pauraque (*Nyctidromus albicollis*), ringed kingfisher (*Ceryle torquata*), golden-fronted woodpecker (*Melanerpes aurifrons*), great kiskadee (*Pitangus sulphuratus*), Couch's kingbird (*Tyrannus couchii*), green jay (*Cyanocorax yncas*), cactus wren (*Campylorhynchus brunneicapillus*), Carolina wren (*Thryothorus ludovicianus*), northern mockingbird (*Mimus polyglottos*), lark sparrow (*Chondestes grammacus*), northern cardinal (*Cardinalis cardinalis*), red-winged blackbird (*Agelaius phoeniceus*), eastern meadowlark (*Sturnella magna*), great-tailed grackle (*Quiscalus mexicanus*), brown-headed cowbird (*Molothrus ater*), Altamira oriole (*Icterus gularis*), and house sparrow (*Passer domesticus*) (McKinney, 2002).

Migrants/summer residents such as the green heron (*Butorides virescens*), white-winged dove (*Zenaida asiatica*), yellow-billed cuckoo (*Coccyzus americanus*), common nighthawk (*Chordeiles minor*), black-chinned hummingbird (*Archilochus alexandri*), brown-crested flycatcher (*Myiarchus tyrannulus*), eastern kingbird (*Tyrannus tyrannus*), scissor-tailed flycatcher (*Tyrannus forficatus*), cliff swallow (*Petrochelidon pyrrhonota*), barn swallow (*Hirundo rustica*), indigo bunting (*Passerina cyanea*), dickcissel (*Spiza americana*), and orchard oriole (*Icterus spurius*) are potential visitors and/or occupants of the study area (McKinney, 2002).

Migrants/winter residents that may potentially frequent the study area include the American white pelican (*Pelecanus erythrorhynchos*), mallard (*Anas platyrhynchos*), blue-winged teal (*Anas discors*), northern shoveler (*Anas clypeata*), osprey (*Pandion haliaetus*), sharp-shinned hawk (*Accipiter striatus*), American avocet (*Recurvirostra americana*), greater yellowlegs (*Tringa melanoleuca*), spotted sandpiper (*Actitis macularia*), sanderling (*Calidris alba*), Forster's tern (*Sterna forsteri*), eastern phoebe (*Sayornis phoebe*), orange-crowned warbler (*Vermivora celata*), savannah sparrow (*Passerculus sandwichensis*), and yellow-headed blackbird (*Xanthocephalus xanthocephalus*) (McKinney, 2002).

The Migratory Bird Treaty Act (MBTA) implements various bilateral treaties and conventions between the U.S., Canada, Mexico, Japan, and the former Soviet Union for the protection of migratory birds. The MBTA prohibits intentional and unintentional take of migratory birds, including their nests and eggs, except where permitted. According to the MBTA, “. . . it is unlawful to pursue, hunt, take, capture or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried or received and migratory bird, part, nest, egg or product, manufactured or not.” EO 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds) directs federal agencies to “ensure that environmental analyses of federal actions required by NEPA or other established environmental review processes evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern.” In 2002, FWS issued the publication *Birds of Conservation*

Concern 2002 (FWS, 2002b), which lists bird species of conservation concern by geographic region (Bird Conservation Areas (BCAs)). FWS recommends that these lists be consulted in accordance with EO 13186. The study area is within BCA-36 (Tamaulipan Brushlands—U.S. portion only). Thirty-six birds of conservation concern are listed by FWS as occurring within BCA-36 (Table 3-2). It should be noted that inclusion on the list does not imply that a species is known to occur in the study area, but only acknowledges its presence in the BCA.

3.5.1.4 Mammals

At least 61 mammalian species occur or have occurred within recent times in the Tamaulipan Biotic Province (Blair, 1950). Those recorded in Hidalgo County include the coyote (*Canis latrans*), common raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), black-tailed jackrabbit (*Lepus californicus*), Mexican ground squirrel (*Spermophilus mexicanus*), and bobcat (*Lynx rufus*).

3.5.2 Important Species

3.5.2.1 Recreationally and Commercially Important Species

Game species annually support a multi-million dollar recreation industry in the Rio Grande Valley (Collins, 1984). The major species of economic importance in this region are the white-winged dove and white-tailed deer (*Odocoileus virginianus*). Other game species include waterfowl, northern bobwhite, mourning dove, plain chachalaca (*Ortalis vetula*), and javelina (*Tayassu tajacu*).

Tourism is also a major industry in the region and birding is a favorite pastime of many visitors (FWS, 1987). A survey of the American Birding Association in 1993 revealed that Texas was the top birding destination in the U.S. (TPWD, 1999), and many birds found in the Lower Rio Grande Valley are found nowhere else in the country.

3.5.2.2 Endangered and Threatened Species

Both the FWS and TXBCD were contacted concerning protected species in Hidalgo County. Table 3-3 lists animal species with a geographic range that includes Hidalgo County and that are considered by the FWS or TPWD to be endangered, threatened, or SOC. Sources reviewed to develop the list include FWS (2002), TXBCD (2002), and Texas Organization for Endangered Species (TOES) (1995). It should be noted that inclusion on the list does not imply that a species is known to occur in the study area, but only acknowledges the potential for occurrence. Only those species listed as endangered or threatened by FWS are afforded complete federal protection.

Five taxa listed in Table 3-3 are considered by both the FWS and TPWD as endangered. These are the northern aplomado falcon (*Falco femoralis septentrionalis*), interior least tern (*Sterna antillarum athalassos*), ocelot (*Leopardus pardalis*), Gulf Coast jaguarundi (*Herpailurus yagouaroundi cacomitli*),

TABLE 3-2

MIGRATORY NON-GAME BIRDS OF CONSERVATION CONCERN
TAMAULIPAN BRUSHLANDS REGION¹

Common Name ²	Scientific Name ²
Northern harrier	<i>Circus cyaneus</i>
Harris's hawk	<i>Parabuteo unicinctus</i>
Swainson's hawk	<i>Buteo swainsoni</i>
Peregrine falcon ³	<i>Falco peregrinus</i>
Snowy plover	<i>Charadrius alexandrinus</i>
Mountain plover ⁴	<i>Charadrius montanus</i>
Long-billed curlew	<i>Numenius americanus</i>
Stilt sandpiper	<i>Calidris himantopus</i>
Buff-breasted sandpiper	<i>Tryngites subruficollis</i>
Gull-billed tern	<i>Sterna nilotica</i>
Red-billed pigeon	<i>Patagioenas flavirostris</i>
Ferruginous pygmy-owl ³	<i>Glaucidium brasilianum</i>
Elf owl	<i>Micrathene whitneyi</i>
Burrowing owl	<i>Athene cunicularia</i>
Buff-bellied hummingbird	<i>Amazilia yucatanensis</i>
Northern beardless-tyrannulet ³	<i>Camptostoma imberbe</i>
Rose-throated becard ³	<i>Pachyramphus algaiae</i>
Loggerhead shrike ⁵	<i>Lanius ludovicianus</i>
Bell's vireo	<i>Vireo bellii</i>
Verdin	<i>Auriparus flaviceps</i>
Cactus wren	<i>Campylorhynchus brunneicapillus</i>
Curve-billed thrasher	<i>Toxostoma curvirostre</i>
Sprague's pipit	<i>Anthus spragueii</i>
Tropical parula ^{3, 5}	<i>Parula pitiayumi</i>
Cassin's sparrow	<i>Aimophila cassinii</i>
Lark bunting	<i>Calamospiza melanocorys</i>
Harris's sparrow	<i>Zonotrichia querula</i>
McCown's longspur	<i>Calcarius mccownii</i>
Chestnut-collared longspur	<i>Calcarius ornatus</i>
Pyrrhuloxia	<i>Cardinalis sinuatus</i>
Varied bunting	<i>Passerina versicolor</i>
Painted bunting	<i>Passerina ciris</i>
Dickcissel	<i>Spiza americana</i>
Hooded oriole ⁵	<i>Icterus cucullatus</i>
Altamira oriole	<i>Icterus gularis</i>
Audubon's oriole ⁵	<i>Icterus graduacauda</i>

¹ According to U.S. Fish and Wildlife Service (FWS) (2002b).

² Nomenclature follows AOU (1998, 2000, 2002, and 2003).

³ Listed by TPWD as endangered or threatened.

⁴ Previously listed by FWS as proposed threatened; notice published 9/9/03 to withdraw proposal.

⁵ Listed by FWS as a species of concern (SOC).

TABLE 3-3

ENDANGERED, THREATENED AND RARE WILDLIFE SPECIES
OF POTENTIAL OCCURRENCE IN HIDALGO COUNTY, TEXAS¹

Common Name ²	Scientific Name ²	Status ³	
		FWS	TPWD
INVERTEBRATES			
Subtropical blue-black tiger beetle	<i>Cicindela nigrocoerulea subtropica</i>	SOC	NL
Maculated manfreda skipper	<i>Stallingsia maculosus</i>	SOC	NL
AMPHIBIANS			
Black spotted newt	<i>Notophthalmus meridionalis</i>	SOC	T
Rio Grande lesser siren	<i>Siren intermedia texana</i>	SOC	T
Mexican treefrog	<i>Smilisca baudinii</i>	NL	T
White-lipped frog	<i>Leptodactylus labialis</i>	NL	T
Sheep frog	<i>Hypopachys variolosus</i>	NL	T
South Texas siren (large form)	<i>Siren</i> sp. ¹	NL	T
REPTILES			
Reticulate collared lizard	<i>Crotaphytus reticulatus</i>	SOC	T
Texas horned lizard	<i>Phrynosoma cornutum</i>	SOC	T
Texas tortoise	<i>Gopherus berlandieri</i>	NL	T
Speckled racer	<i>Drymobius margaritiferus</i>	NL	T
Texas indigo snake	<i>Drymarchon corais erebennus</i>	NL	T
Black striped snake	<i>Coniophanes imperialis</i>	NL	T
Northern cat-eyed snake	<i>Leptodeira septentrionalis</i>	NL	T
FISHES			
River goby	<i>Awaous tajasica</i>	NL	T
Bluntnose shiner (extirpated in Texas)	<i>Notropis simus simus</i>	NL	T
MOLLUSKS			
Texas hornshell	<i>Popenaias popeii</i>	C1	NL
BIRDS			
Northern aplomado falcon	<i>Falco femoralis septentrionalis</i>	E	E
Interior least tern	<i>Sterna antillarum athalassos</i>	E	E
Piping plover	<i>Charadrius melodus</i>	T	T
Bald eagle	<i>Haliaeetus leucocephalus</i>	T/PDL	T
American peregrine falcon	<i>Falco peregrinus anatum</i>	DL	E
Arctic peregrine falcon	<i>Falco peregrinus tundrius</i>	DL	T
Reddish egret	<i>Egretta rufescens</i>	SOC	T
White-faced ibis	<i>Plegadis chihi</i>	SOC	T
Northern gray hawk	<i>Asturina nitidus maximus</i>	SOC	T
Ferruginous hawk	<i>Buteo regalis</i>	SOC	NL
Tropical parula	<i>Parula pitiayumi</i>	SOC	T

TABLE 3-3 (CONCLUDED)

Common Name ²	Scientific Name ²	Status ³	
		FWS	TPWD
Texas Botteri's sparrow	<i>Aimophila botterii texana</i>	SOC	T
Loggerhead shrike	<i>Lanius ludovicianus</i>	SOC	NL
Brownsville common yellowthroat	<i>Geothlypis trichas insperata</i>	SOC	NL
Texas olive sparrow	<i>Arremonops rufivirgatus rufivirgatus</i>	SOC	NL
Sennett's hooded oriole	<i>Icterus cucullatus sennetti</i>	SOC	NL
Audubon's oriole	<i>Icterus graduacauda</i>	SOC	NL
Wood stork	<i>Mycteria americana</i>	E ⁴	T
Common black hawk	<i>Buteogallus anthracinus</i>	NL	T
White-tailed hawk	<i>Buteo albicaudatus hyospodius</i>	NL	T
Zone-tailed hawk	<i>Buteo albonotatus</i>	NL	T
Cactus ferruginous pygmy-owl	<i>Glaucidium brasilianum cactorum</i>	E ⁵	T
Northern beardless-tyrannulet	<i>Camptostoma imberbe</i>	NL	T
Rose-throated becard	<i>Pachyrhamphus aglaiae</i>	NL	T
MAMMALS			
Ocelot	<i>Leopardus pardalis albescens</i>	E	E
Gulf Coast jaguarundi	<i>Herpailurus yagouaroundi cacomitli</i>	E	E
Jaguar (extirpated in Texas)	<i>Panthera onca</i>	E	E
Coues' rice rat	<i>Oryzomys couesi aquaticus</i>	SOC	T
Southern yellow bat	<i>Lasiurus ega</i>	NL	T
White-nosed coati	<i>Nasua narica</i>	NL	T

¹ According to FWS (2002a), TXBCD (2003).

² Nomenclature follows Correll and Johnston (1979), Hubbs et al. (1991), Manning and Jones (1998), AOU (1998, 2000, 2002, and 2003), Crother et al. (2000 and 2001), FWS (2002a), and TXBCD (2003).

³ FWS – U.S. Fish and Wildlife Service.

TPWD – Texas Parks and Wildlife Department.

E – Endangered.

E⁴ – Federally listed as endangered only in Alabama, Florida, Georgia, and North and South Carolina, not federally listed in Texas.

E⁵ – Federally listed as endangered only in Arizona, not federally listed in Texas.

T – Threatened.

PT – Species proposed for listing as threatened.

T/PDL – Currently listed as Threatened, but proposed for delisting.

DL – Formerly listed as threatened or endangered, but due to significant population increases, has officially been removed from threatened or endangered status.

NL – Not listed.

SOC – FWS Species of Concern; species for which there is some evidence of vulnerability, but not enough data to support listing at this time.

C1 – Candidate for federal listing.

and jaguar (*Panthera onca* — extirpated in Texas). The FWS and TPWD list the piping plover (*Charadrius melodus*) as threatened. The bald eagle (*Haliaeetus leucocephalus*) is state listed and federally listed as threatened but has been proposed to be removed from the federal endangered and threatened species list. The mountain plover (*Charadrius montanus*) had been proposed for listing as threatened by the FWS, but a notice was published on September 9, 2003, to withdraw the proposal. The Texas hornshell (*Popenaias popeii*) has not been proposed for listing, but is currently a candidate for listing by the FWS.

The northern aplomado falcon is a small raptor that inhabits savannahs and open woodlands, nesting on tall platforms such as branches and utility poles, and often uses other raptors' nests (Hector, 1981; FWS, 1995). The species was apparently extirpated as a breeding bird within Texas and the U.S. and the last breeding record was for Deming, New Mexico in 1952 (Oberholser, 1974). Successful efforts have been made for the reintroduction of the aplomado falcon at more than a dozen sites along the Texas Gulf Coast from Calhoun County to Cameron County (Peregrine Fund, 2002). Since 1985, over 100 aplomado falcons have been released at the Laguna Atascosa NWR in an effort to reintroduce the species (*Austin American-Statesman*, 1996). In 1995, a pair of these released birds successfully nested on a transmission line pole near Brownsville. In 1996, this same pair nested in a nearby mesquite, but the female and young were subsequently killed by a great horned owl (*Bubo virginianus*) (*Austin American-Statesman*, 1996). This falcon is now considered a rare summer resident in the Lower Rio Grande Valley and the Trans-Pecos (Texas Ornithological Society (TOS), 1995). There is no suitable habitat for this species within the study area and it is unlikely that this species would occur there.

The interior least tern historically nested in Texas on sandbars of the Colorado River, Red River, and Rio Grande. The interior least tern's preferred habitat is bare, frequently flooded sand flats, salt flats, sand and gravel bars, and beaches of sand, shell or gravel (Campbell, 1995; Thompson et al., 1997). Small remnant breeding populations persist at isolated locations within the species' historic range, and it winters along the entire Texas Gulf Coast. There are no official records of interior least terns in Hidalgo County (Oberholser, 1974) and the species is identified as an uncommon migrant in the region (TOS, 1995). The closest recorded interior least tern nesting locations are along the shores of Lake Amistad, Val Verde County, approximately 300 miles northwest of the study area (FWS, 1990). No known nesting sites occur in Hidalgo County, but the species is listed as an occasional visitor to nearby Santa Ana NWR (FWS, 1999). This species is not expected to nest within the study area, but may occur in appropriate habitat during migration.

The ocelot is a medium-sized cat that historically inhabited dense thornscrub and thickets in south Texas, the Gulf Coast, and the Big Thicket of east Texas (Davis and Schmidly, 1994). Today, ocelots are restricted to small, remnant patches of dense thornscrub in the Lower Rio Grande Valley (Davis and Schmidly, 1994). Approximately 100 ocelots are thought to still occur in Texas (Laack, 1998). One or two ocelots presumably occur at Santa Ana NWR (Benn, 1997; Laack, 1998). Ocelot sightings have also been reported from the LRGV NWR (Benn, 1997). Ocelots may occur in the NWR tracts in the study area

and there is a remote possibility that they may traverse other portions of the study area between areas of suitable habitat or while dispersing from existing territories.

The jaguarundi is a rare, small slender-bodied cat that inhabits dense thornscrub and brushland in Cameron, Hidalgo, Starr, and Willacy counties (Davis and Schmidly, 1994). Unconfirmed jaguarundi sightings in Hidalgo County include Bentsen-Rio Grande State Park, Santa Ana NWR, LRGV NWR, Cimarron Country Club, Wimberley Ranch, and the Anacua Unit of TPWD's Las Palomas Wildlife Management Area (Prieto, 1990, 1991; Benn, 1997). Recent (March 1998) jaguarundi sightings have been reported from Santa Ana NWR (Santa Ana NWR data). The TXBCD (2003) shows a documented field observation of the jaguarundi in the Gabrielson Tract of the LRGV NWR, which is located in the southwestern corner of the study area. Jaguarundis may occur in dense brushlands within the study area and there is a remote possibility that they may traverse other portions of the study area while traveling between areas of suitable habitat or while dispersing from existing territories.

The jaguar is a large cat that was once fairly common in dense chaparral and timbered sections of southern and eastern Texas, north to the Red River (Davis and Schmidly, 1994). Jaguars were last recorded in Texas in the early 1900s and the species is considered extirpated from the state (Davis and Schmidly, 1994).

The bald eagle is present in Texas year-round, and may be found breeding, wintering, and during migration. In Texas, bald eagles breed along the Gulf Coast and on major inland lakes and reservoirs. Additional numbers of bald eagles winter in these habitats. Bald eagles prefer large bodies of water surrounded by tall trees or cliffs, which are used as nesting sites. No bald eagle nests are known to occur in Hidalgo County (Ortego, 2001); however, the study area is within the general distribution pattern of this species, and occasional visitors to the region are possible. Suitable habitat occurs along the Rio Grande; however, this species would be expected only as a rare migrant or winter visitor.

In Texas, the piping plover inhabits coastal beaches and tidal flats. Approximately 35% of the known population of piping plovers winters along the Texas Gulf Coast, where they spend 60 to 70% of the year (Campbell, 1995). The population of piping plovers that winter in Texas breeds on the northern Great Plains and the Great Lakes. The species is considered a rare to uncommon migrant and winter resident in coastal areas of south Texas (TOS, 1995; McKinney, 2002). The piping plover is considered an accidental spring migrant/winter resident at Santa Ana NWR, but has not been recorded within the study area (FWS, 1999; TXBCD, 2003). This species may occur in the study area as a rare migrant.

The Texas hornshell is considered a candidate for listing by the FWS. This mollusk has a limited distribution in Texas with known occurrences from the Rio Grande River to the Pecos River, San Francisco Creek in the Big Bend area, the Devils River, and the Rio Salado in Mexico (Howells et al., 1996). Although little information is available for this species, Howells et al. (1996) consider loss of

habitat combined with a deterioration in water quality to have contributed to the decline of the Texas hornshell. It is very unlikely for this freshwater species to occur in the study area.

While not listed or proposed for listing by the FWS, 17 taxa in Table 3-3 are identified as SOC by the FWS. These include two insects, the subtropical blue-black tiger beetle (*Cicindela nigrocoerulea subtropica*) and maculated manfreda skipper (*Stallingsia maculosus*); two amphibians, the black spotted newt (*Notophthalmus meridionalis*) and Rio Grande lesser siren (*Siren intermedia texana*); two reptiles, the reticulate collared lizard (*Crotaphytus reticulatus*) and Texas horned lizard (*Phrynosoma cornutum*); 11 birds, the reddish egret (*Egretta rufescens*), white-faced ibis (*Plegadis chihi*), northern gray hawk (*Asturina nitidus maximus*), ferruginous hawk (*Buteo regalis*), tropical parula (*Parula pitiayumi*), Texas Botteri's sparrow (*Aimophila botterii texana*), loggerhead shrike (*Lanius ludovicianus*), Brownsville common yellowthroat (*Geothlypis trichas insperata*), Texas olive sparrow (*Arremonops rufivirgatus rufivirgatus*), Sennett's hooded oriole (*Icterus cucullatus sennetti*), and Audubon's oriole (*Icterus graduacauda*); and one mammal, Coues' rice rat (*Oryzomys couesi aquaticus*). Of these, the black spotted newt, Rio Grande lesser siren, reticulate collard lizard, Texas horned lizard, reddish egret, white-faced ibis, northern gray hawk, tropical parula, Texas Botteri's sparrow, and Coues' rice rat are also state-listed as threatened.

The subtropical blue-black tiger beetle is a predaceous insect that typically occurs during summer months in open, sunny areas. Common habitats are alkali, or wet soil locations along water sources (Hoback and Riggins, 2001). Their larvae live in vertical subterranean burrows on dry paths, in fields, or along sandy shorelines (TXBCD, 2002). According to the FWS and TXBCD, it is of potential occurrence in the study area.

The maculated manfreda skipper is a rare butterfly known from northern Mexico and several south Texas counties, including Hidalgo County. Maculated manfreda skippers inhabit subtropical thornscrub and pine forest (Opler, 1998). The larvae are closely associated with the plant Texas tuberose (*Manfreda maculosus*), which grows on prairies and chaparral-covered hills of the Rio Grande Valley and plains (Tilden and Smith, 1986; Correll and Johnston, 1979). This species may occur in the study area within native plant communities.

The black-spotted newt is primarily aquatic and inhabits heavily vegetated, shallow-water lagoons, streams, ditches, and swamps along the coastal plains of south Texas (Garrett and Barker, 1987). The species has been recorded from the Mission Main Canal, located approximately 2.4 km (1.5 miles) east of the study area (TXBCD, 2003), and may be present in the study area where appropriate habitat occurs.

The Rio Grande lesser siren is a large aquatic species that inhabits warm, densely vegetated shallow waters, including muddy ponds, lakes, marshes, and irrigation ditches of the Lower Rio Grande Valley (Garrett and Barker, 1987). Although the species is known from Hidalgo County (Dixon, 2000), there are

no recorded occurrences of the species within the study area (TXBCD, 2003). Rio Grande lesser sirens may be present in the study area where appropriate habitat occurs.

The reticulate collared lizard inhabits riverine brushland and arroyo banks in the western portions of south Texas, from Hidalgo County north to Uvalde County (Garrett and Barker, 1987). Although the species is known from Hidalgo County (Dixon, 2000), there are no recorded occurrences of the species within the study area (TXBCD, 2003). Reticulate collared lizards may be present in the study area where appropriate habitat occurs.

The Texas horned lizard is found throughout the western two-thirds of the state in a variety of habitats, but prefers arid to semi-arid habitats in sandy loam or loamy sand soils that support patchy bunch-grasses, cacti, yucca, and various shrubs (Henke and Fair, 1998; Dixon, 2000). Although the species is known from Hidalgo County (Dixon, 2000), there are no recorded occurrences of the species within the study area (TXBCD, 2003). Texas horned lizards may be present in the study area where appropriate habitat occurs.

The reddish egret is a resident of brackish marshes, tidal flats, and shallow salt lakes along the Texas Gulf Coast (TXBCD, 2002). They nest in brushy yucca and prickly pear thickets on dry coastal islands (Oberholser, 1974). Reddish egrets are considered rare winter visitors to inland portions of the Lower Rio Grande Valley and they have been recorded at nearby Santa Ana NWR (McKinney, 2002, FWS, 1999). There is a slight possibility that the species could use project area ponds as stopover points during post-breeding.

The white-faced ibis is a medium-sized wading bird that inhabits freshwater marshes, sloughs, and irrigated rice fields, but may also be found in brackish and saltwater habitats. White-faced ibis are permanent residents along the Texas Gulf Coast; however, nesting records exist for many scattered inland localities (TOS, 1995). The species is a rare to uncommon migrant throughout the state and may occasionally be found as a post-breeding visitor north and west of its typical range. The species has been recorded in Hidalgo County, including nearby Santa Ana NWR (Oberholser, 1974, FWS, 1999). There is a slight possibility that the species could use project area ponds as stopover points during spring and fall migration or during post-breeding.

The northern gray hawk, a subspecies of gray hawk, is a neotropical raptor whose range reaches its northern-most limits along the U.S.-Mexico border. Gray hawks inhabit mature riparian woodlands and nearby mesquite and scrub grasslands (Oberholser, 1974). Formerly more common and widespread along the lower Rio Grande, this species is now an uncommon local resident in remnant riparian woodlands in the Lower Rio Grande Valley. The species has been recorded nesting at Anzalduas County Park in the southwest portion of the study area (Sarkozi, 2002; TXBCD, 2003).

The ferruginous hawk inhabits open plains, grasslands, and woodland edges throughout the western half of the U.S. (Oberholser, 1974; Clark and Wheeler, 2001). In Texas, ferruginous hawks are rare summer

residents in the western Panhandle and rare to locally common winter residents in the remainder of the state, being locally uncommon in the south Texas plains (TOS, 1995). A ferruginous hawk was reported from the Santa Ana NWR in April 1998 (Santa Ana NWR data). This species could possibly occur within the study area as a rare migrant or winter visitor.

The tropical parula is a small passerine that nests in bottomland forests, selecting sites where trees are covered in epiphytic Spanish moss (*Tillandsia usneoides*) and gray-green lichen (*Usnea* sp.), which are used as nest material (Oberholser, 1974; TOS, 1995; Regelski and Moldenhauer, 1997). Tropical parulas have nested at Santa Ana NWR and there are winter and spring records of the species from Anzalduas County Park in the southwest portion of the study area (FWS, 1999; Sarkozi, 2002).

Texas Botteri's sparrow, a subspecies of Botteri's sparrow, is largely restricted to bunch-grass prairies and grasslands on the lower coastal plain from Kenedy County south to Cameron County (Oberholser, 1974; TOS, 1995). It is a locally common nesting bird in *Spartina*-dominated grasslands of Cameron and Willacy counties and may possibly occur in grassland habitats within Hidalgo County. This species, however, is not likely to frequent the study area because of the general absence of suitable habitat.

The loggerhead shrike is a small predatory bird that inhabits open or semi-open country with scattered trees and shrubs, including agricultural fields, savannah, desert scrub, and occasionally open woodlands. Loggerhead shrikes hunt for insects, and small birds and rodents, which they impale on sharp objects like cactus spines and mesquite thorns, and the barbs of barbed-wire fences. The loggerhead shrike is a rare to common resident throughout Texas, except for portions of the South Texas Plains (TOS, 1995). Local populations are often increased by an influx of wintering birds (TOS, 1995). In the Lower Rio Grande Valley, loggerhead shrikes are common migrants and winter residents (McKinney, 2002). Loggerhead shrikes have been observed in the study area and are likely to occur in the study area where appropriate habitat occurs.

The Brownsville common yellowthroat, a subspecies of the common yellowthroat, was once a fairly common migrant/winter resident in southern Texas, including Hidalgo County (Oberholser, 1974). This species, however, has become increasingly rare. The common yellowthroat typically inhabits marshes, especially cattail (*Typha* spp.) thickets near water, bogs, brushy pastures, and old fields. It is more widespread in marshy, brushy, and weedy areas during migration and winter (American Ornithologists' Union (AOU), 1998; Guzy and Ritchison, 1999). This species may be present in the study area where appropriate habitat occurs.

The Texas olive sparrow, a subspecies of olive sparrow, is a common resident in southern Texas, inhabiting tropical hardwood forests, arid lowland scrub, and riparian thickets (TOS, 1995; Brush, 1998). This species is a common year-round resident in woodlands in Hidalgo County (Oberholser, 1974, McKinney, 2002) and may be present in the study area where appropriate habitat occurs.

Sennett's hooded oriole, a subspecies of hooded oriole, is a rare to locally common summer resident along the Rio Grande from El Paso south through the lower Rio Grande Valley, north to the southern edge of the Edwards Plateau and east to Nueces County (TOS, 1995). In Texas, their preferred habitat is mesquite brush and Texas ebony woodland, but they also commonly nest in palm trees (*Sabal* spp. and *Washingtonia* spp.) (Pleasants and Albano, 2001). Hooded orioles have been recorded at nearby Santa Ana NWR (FWS, 1999) and may be present in the study area where appropriate habitat occurs.

Audubon's oriole is a rare to uncommon year-round resident in south Texas, north to Duval, Goliad, and Val Verde counties (TOS, 1995). Audubon's orioles typically inhabit dense woodland and thickets along watercourses (Oberholser, 1974; TXBCD, 2002). The species has been recorded at nearby Santa Ana NWR (FWS, 1999) and may be present in the study area where appropriate habitat occurs.

Coues' rice rat is a Mexican species whose range reaches into south Texas, where it occurs in Hidalgo and Cameron counties (Davis and Schmidly, 1994). In Hidalgo County, they have been captured in cattail and bulrush (*Scirpus* spp.) dominated marshes, as well as in grassy areas near resacas (oxbow lakes) (Davis and Schmidly, 1994). Coues' rice rat has been recorded from the Santa Ana NWR (Santa Ana NWR data) and may be present in the study area where appropriate habitat occurs. The remaining 22 taxa, listed on Table 3-3, are neither federally listed in Texas nor SOC, but are state-listed as threatened. These are: the Mexican treefrog (*Smilisca baudinii*), white-lipped frog (*Leptodactylus labialis*), sheep frog (*Hypopachus variolosus*), South Texas siren (large form) (Siren sp.1), Texas tortoise (*Gopherus berlandieri*), speckled racer (*Drymobius magaritifera*), Texas indigo snake (*Drymarchon corais erebennus*), black-striped snake (*Coniophanes imperialis*), northern cat-eyed snake (*Leptodeira septentrionalis septentrionalis*), river goby (*Awaous tajasica*), bluntnose shiner (*Notropis simus simus*), American peregrine falcon (*Falco peregrinus anatum*), arctic peregrine falcon (*Falco peregrinus tundrius*), wood stork (*Mycteria americana*), common black-hawk (*Buteogallus anthracinus*), white-tailed hawk (*Buteo albicaudatus*), zone-tailed hawk (*Buteo albonotatus*), cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*), northern beardless-tyrannulet (*Camptostoma imberbe*), rose-throated becard (*Pachyramphus aglaiae*), southern yellow bat (*Lasiurus ega*), and white-nosed coati (*Nasua narica*).

The Mexican treefrog inhabits humid microhabitats within arid and semiarid regions of extreme south Texas (Garrett and Barker, 1987). Typical habitat includes wooded areas along streamsides, resacas, and roadside ditches. The species has been recorded in Hidalgo County (Dixon, 2000); however, no known records exist from the study area (TXBCD, 2003). Mexican treefrogs may be present in the study area where appropriate habitat occurs.

The white-lipped frog is a nocturnal species that inhabits irrigated fields, irrigation ditches, low grasslands, and runoff areas in the extreme southern portions of the Lower Rio Grande Valley (Garrett and Barker, 1987; TXBCD, 2002). The species has been recorded in Hidalgo County (Dixon, 2000);

however, no known records exist from the study area (TXBCD, 2003). White-lipped frogs may be present in the study area where appropriate habitat occurs.

The sheep frog is a secretive species found in extreme south Texas (Garrett and Barker, 1987). Sheep frogs prefer moist habitats in arid areas, including rodent burrows and fallen trees, as well as pond edges and irrigation ditches (Garrett and Barker, 1987; TXBCD, 2002). The species has been recorded in Hidalgo County (Dixon, 2000) and there is a known record from the Edinburg Main Canal, approximately 5.6 km (3.5 miles) northeast of the study area (TXBCD, 2003). Sheep frogs may be present in the study area where appropriate habitat occurs.

The South Texas siren is a large aquatic species that inhabits arroyos, canals, ditches, and shallow depressions in south Texas, south of the Balcones Escarpment (TXBCD, 2002). This species is not well understood and warrants further evaluation to determine its status as a species. There is a known record of South Texas siren from Sardina Resaca approximately 1.3-km (0.8-mile) north of the study area (TXBCD, 2003). The species may be present in the study area where appropriate habitat occurs.

The Texas tortoise is a terrestrial turtle that inhabits sandy soils in areas of low, sparse vegetation throughout the southern portion of the state (Garrett and Barker, 1987). Texas tortoises may burrow in the sand or enter animal burrows, but typically seek cover in a shallow scrape under shrubs or cacti. The species has been recorded in Hidalgo County (Dixon, 2000); however, no known records exist from the study area (TXBCD, 2003). Texas tortoises may be present in the study area where appropriate habitat occurs.

The speckled racer is a tropical nonvenomous snake whose range reaches into extreme south Texas, where it occurs in Hidalgo and Cameron counties (Werler and Dixon, 2000). They are rare in Texas and occur only in native subtropical woodlands, which is extremely restricted in extent. The National Audubon Society's Sabal Palm Sanctuary is thought to have the largest population of speckled racers in Texas (Werler and Dixon, 2000). Speckled racers inhabit dense riparian woodlands and thickets and groves of Texas palm (*Sabal texana*). The species has been recorded in Hidalgo County (Dixon, 2000), and they may be present in the study area where appropriate habitat occurs.

The Texas indigo snake is a large, powerful nonvenomous snake that occurs in thornscrub and woodlands throughout south Texas, north to the southern Edwards Plateau and east along the Nueces River (Werler and Dixon, 2000). This species is found in a variety of habitats, but requires moist microhabitats including streambanks, ponds and tanks, resacas, and windmills (Werler and Dixon, 2000). The species has been recorded in Hidalgo County (Dixon, 2000), and they may be present in the study area where appropriate habitat occurs.

The black-striped snake is a mildly venomous, rear-fanged snake that occurs in the extreme south of Texas, including Cameron, Willacy, and Hidalgo counties (Werler and Dixon, 2000). Black-striped snakes seek cover in warm, moist microhabitats, particularly in sandy soils or under other available cover

such as cacti, palm fronds, logs, or construction debris (Tennant, 1985). The species has been recorded in Hidalgo County (Dixon, 2000), and TXBCD (2003) indicates a record from the Edinburg Main Canal, approximately 5.6 km (3.5 miles) northeast of the study area. Black-striped snakes may be present in the study area where appropriate habitat occurs.

The northern cat-eyed snake is a mildly venomous, rear-fanged snake that inhabits thornscrub and woodlands in Cameron, Willacy, Hidalgo, and Kenedy counties (Werler and Dixon, 2000). Northern cat-eyed snakes typically inhabit moist microhabitats, particularly dense vegetation adjacent to ponds, streams, and other water bodies (Tennant, 1985; Werler and Dixon, 2000). The species has been recorded in Hidalgo County (Dixon, 2000) and may be present in the study area where appropriate habitat occurs.

The river goby occurs along the Atlantic and Gulf coasts of the U.S. In Texas, this species is known only from Hidalgo and Willacy counties; however, it is very rare in the Rio Grande, apparently reaching the northern edge of its distribution in this stream (Hubbs et al., 1991). Habitat includes lakes, ponds, rivers and streams, brackish and estuarine areas, occurring only in brackish water in seasonally intermittent streams (Watson, 1996). TXBCD (2003) indicates a record from just below Anzalduas Dam, within the study area.

The Texas subspecies of bluntnose shiner once occurred throughout the Rio Grande basin, but has not been recorded since 1964 and is now thought to be extinct (Hubbs et al., 1991). A second subspecies (*Notropis simus pecosensis*) still occurs in the Pecos River basin in New Mexico. This species is thought to be extinct, therefore, it is not expected to occur within study area waters.

Two subspecies of peregrine falcon are listed in Table 3-2. The American peregrine falcon is a rare migrant statewide, and nests in the mountains of Trans-Pecos Texas (TOS, 1995). The arctic peregrine falcon is an uncommon migrant statewide and an uncommon winter resident in the Lower Rio Grande Valley (TOS, 1995). The peregrine falcon was recently removed from the FWS list of endangered species, but the American and arctic subspecies retain their state-listed status as endangered and threatened, respectively. Padre Island is the most important known staging area for migrant peregrine falcons in the Western Hemisphere (Morizot and Maechtle, 1987). Peregrine falcons have been reported from Santa Ana NWR (Santa Ana NWR data). Because of the relative proximity of the study area to South Padre Island, peregrine falcons could occasionally occur within the study area, particularly during the spring and fall migrations.

The wood stork is an uncommon to locally common post-breeding visitor (probably from the Mexican population) to coastal Texas and inland waters in east and central Texas (TOS, 1995). Wood storks formerly bred in North America along the Gulf coast from east Texas to Florida, but their range has been significantly reduced since the 1960s and their North American breeding range is now restricted to Florida, Georgia, and South Carolina (Oberholser, 1974; Coulter et al., 1999). In Texas, wood storks are typically found in the vicinity of freshwater or saltwater wetlands, lakes, or along rivers and streams.

Wood storks are federally listed as endangered in Florida, Alabama, Georgia, North Carolina, and South Carolina, but not in Texas. The species has been recorded in Hidalgo County (Oberholser, 1974), and individuals have been recorded from the Santa Ana NWR during the summer, spring and fall (FWS, 1999). There is a possibility that wood storks could occur in the study area as post-breeding visitors; however, suitable foraging and roosting habitat for this species is extremely limited within the study area.

The common black-hawk is described as rare in south Texas (Schnell et al., 1988; McKinney, 2002). According to Oberholser (1974) the last confirmed nesting of this species in the Lower Rio Grande Valley occurred in Cameron County in 1937, and breeding populations have probably been extirpated in the area as a result of desiccation in the valley. Breeding birds formerly occurred in willow groves along the Rio Grande floodplain in southern Starr, Hidalgo, and Cameron counties. Recent sightings have generally been in the Laguna Madre vicinity on coastal prairie. This species is considered rare (seen every two to five years) in the fall, winter, and spring at nearby Santa Ana NWR; several sightings occurred there in April 1998 (Santa Ana NWR data). This species is not expected to occur within the study area.

The white-tailed hawk is an uncommon local resident on the Gulf coastal plain, from Harris County south to the Rio Grande (TOS, 1995). White-tailed hawks inhabit coastal prairies and brushlands, as well as inland mesquite and oak savannahs (TXBCD, 2002). The species is listed as an occasional visitor to inland areas of the Lower Rio Grande Valley, but is listed as a rare year-round visitor to nearby Santa Ana NWR (FWS, 1999; McKinney, 2002). This species may occasionally occur within the study area.

The zone-tailed hawk is a rare to uncommon breeding bird in the Trans-Pecos and Edwards Plateau regions of Texas (Oberholser, 1974). No verified breeding records exist for Hidalgo or adjacent counties (Oberholser, 1974). This species is considered accidental in summer and rare in winter at the Santa Ana NWR (FWS, 1999). In July 2003, a zone-tailed hawk was recorded at Anzalduas County Park (Clark, 2003). The zone-tailed hawk may occur in the study area as an accidental visitor.

In Texas, the cactus ferruginous pygmy-owl inhabits mesquite-ebony thornscrub and ranges from the Lower Rio Grande Valley north into Kenedy County (Oberholser, 1974; TOS, 1995). The species is listed by FWS as endangered in Arizona, but is recognized as a SOC in Texas. It is a rare, year-round resident at Santa Ana NWR (FWS, 1999). Ferruginous-pygmy owls may occur in the study area where suitable brushland habitat is present.

The northern beardless-tyrannulet is a small neotropical flycatcher that is a rare to locally uncommon resident in the Lower Rio Grande Valley (TOS, 1995). The species prefers mesquite woodlands, but is also found along the Rio Grande in riparian woodlands (Oberholser, 1974). Northern beardless-tyrannulets have been recorded at Anzalduas County Park (Sarkozi, 2002) and may be present elsewhere in the study area where appropriate habitat occurs.

The rose-throated becard is a medium-sized neotropical flycatcher that was formerly a rare resident in the Lower Rio Grande Valley, but is now typically a rare winter visitor to the region (TOS, 1995). The

species inhabits riparian woodlands, where it commonly nests in Montezuma baldcypress (*Taxodium mucronatum*), black willow, and sycamore (*Platanus occidentalis*). Recent nesting records exist from Anzalduas County Park (Sarkozi, 2002; TXBCD, 2003), therefore, the species may be present elsewhere in the study area where appropriate habitat occurs.

The southern yellow bat is a neotropical bat that is widespread in Mexico and South America, but has also been recorded in southern Arizona, southwestern New Mexico, and south Texas. Most of the specimens collected in Texas are from along the Rio Grande in Cameron County, but they have been collected as far north as Corpus Christi in Nueces County (Spencer et al., 1988; Schmidly, 1991). The southern yellow bat is a migratory species but is a permanent resident in Texas (Schmidly, 1991). They are a tree-roosting species, commonly roosting in palm trees. All of the specimens collected in Texas have been from palm groves or isolated palm trees. This species may be present in the study area where suitable roost sites are available.

The white-nosed coati is a raccoon-like (Procyonid) carnivore that inhabits woodlands from Central America and Mexico north to south Texas. In Texas white-nosed coatis are rare inhabitants from extreme south Texas (Cameron Co.) to the Big Bend region, with records from Aransas, Brewster, Cameron, Hidalgo, Kerr, Maverick, Starr, Uvalde, and Webb counties (Davis and Schmidly, 1994). This species may be present in the study area where appropriate habitat occurs.

3.5.2.3 Critical Habitat

Under the federal ESA, the Secretary of the Interior may designate “critical habitat” for an endangered or threatened species. The ESA defines critical habitat as “. . . the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of Section 4 of this Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and specific areas outside the geographical area occupied by the species at the time it is listed . . . upon a determination by the Secretary that such areas are essential for the conservation of the species.” No such designated critical habitat occurs within the study area.

3.6 AQUATIC ECOLOGY

3.6.1 Aquatic Habitats and Species

As noted above, the study area lies within the Tamaulipan Biotic Province. Although the various biotic provinces were originally separated on the basis of terrestrial animal distributions, Hubbs (1957) has shown that the distribution of freshwater fishes within the state generally coincides with the terrestrial-vertebrate province boundaries, although northeast Texas and the coastal zone show a number of departures from this general rule.

The natural flow in the Rio Grande has been greatly altered by upstream impoundments and diversionary floodways leading to the coastline. Flow in the river is composed mainly of precipitation from local rains, irrigation runoff, and effluent from upstream municipalities in both Texas and Mexico (Breur, 1970).

The aquatic biota comprise the living portion of the aquatic ecosystem, interacting through their preferred habitats and positions in the food web. Analysis of aquatic systems is usually approached through the better-understood elements phytoplankton (and/or periphyton), zooplankton, benthos, and fish.

Phytoplankton, the microscopic algal forms suspended in the water column, is usually a major component of the aquatic food chain in an impoundment. In flowing waters, however, phytoplankton has more difficulty in maintaining substantial populations, and much of the organic input in riverine systems is frequently due to washed-in organic material and sometimes aquatic macrophytes. Under eutrophic conditions, reservoir phytoplankton can adversely affect water quality by forming slime or scum, producing unpleasant tastes and odors, and increasing the organic load sinking into the deep hypolimnion during stratification periods. Nuisance blooms are frequently due to blue-green algae (Cyanobacteria), although numerous other forms can reach nuisance levels.

The zooplankton forms an important part of the food chain in reservoirs and in many slow-flowing waters. Zooplankton feeds on phytoplankton, detrital particles, bacteria, protozoa, and other zooplankton, and in turn is preyed upon by macroinvertebrates and numerous fish species. Rotifers are generally the dominant zooplankton in larger rivers and are also abundant in lakes and reservoirs. Cladocerans and copepods are relatively less common in flowing water and reach substantial concentrations only in a lake or reservoir environment.

The benthic macroinvertebrates of freshwater systems form a highly diverse group of organisms with a wide variety of functions in the aquatic community. In addition to serving as a major food source for vertebrate predators such as fish, macroinvertebrates have important roles as herbivores, detritivores, and carnivores. The major groups generally included in the macroinvertebrate category are the Insecta (particularly immature forms), Mollusca (mussels and snails), Oligochaeta (aquatic earthworms) and Crustacea (crawfishes and shrimp). The composition of macroinvertebrates in flowing waters is greatly influenced by the substratum type. Clinging and hiding forms occur in rocky areas of larger particle size, while burrowing forms are more common in sandy, silt-covered, and muddy bottoms. The greatest diversity generally occurs on rocky substrates. Many species require a current to satisfy food and respiratory needs, and cannot survive in a standing-water environment. The unionid mussels, crawfishes, prosobranch snails and the larvae of mayflies, stone flies, caddisflies and dobsonflies, usually reach maximum development in running waters. Generally, in ponds and resacas, the greatest diversity of macroinvertebrates is found along the shallow, vegetated littoral zones. A decline in diversity is typically noted in the deep benthos found in the soft bottom of Texas reservoirs, although the species that are present frequently reach substantial numbers. Various investigations have shown that the characteristic dominants of deeper zones are fly larvae and sometimes oligochaete worms. Some members of the deep

benthos are tolerant of low oxygen levels. *Tubifex* (an oligochaete) can persist under near-anoxic conditions, and very high densities of this genus may be an indication of organic pollution.

Fish are prominent in the trophic structure of most aquatic habitats, being the largest and most conspicuous of the ecosystem's resident consumers. Extensive environmental changes in an area can lead directly or indirectly to changes in the feeding habits of fish. However, changes in available feeding levels are not necessarily detrimental, unless the organism's feeding habits are very specialized. Food habits of fish vary with season, food availability and life cycle stages. For example, the diet of most young fish consists of microscopic plants and animals including algae, protozoans and crustaceans found on plants, in bottom material or suspended in the water column. As fish develop and attain sexual maturity, feeding adaptations develop and the diets of some species become very restricted. Some fish are herbivorous, while others (e.g., bass) are strictly carnivorous. Most of the sunfish and catfish are omnivorous.

Two indigenous fish assemblages occur in the Rio Grande drainage: one is upstream and composed mostly of freshwater species, and the other is downstream and composed of a mixture of the upstream species and estuarine and marine species. According to fish distribution data available for the Rio Grande drainage, 149 species have been recorded between Lake Amistad and the Gulf of Mexico (Espey, Huston & Associates, Inc. (EH&A), 1988). Flowing aquatic systems of the area appear to be restricted to the Rio Grande. The freshwater fauna is probably composed largely of small forage fish assemblages such as the Tamaulipas shiner (*Notropis braytoni*), red shiner (*Cyprinella lutrensis*), inland silverside (*Menidia beryllina*), sheepshead minnow (*Cyprinodon variegatus*), mosquitofish (*Gambusia affinis*), sailfin molly (*Poecilia latipinna*), threadfin shad (*Dorosoma petenense*), and gizzard shad (*Dorosoma cepedianum*). Other commonly encountered species include catfishes (Ictaluridae), common carp (*Cyprinus carpio*), buffalo (*Ictiobus* spp.), striped mullet (*Mugil cephalus*), the Mexican tetra (*Astyanax mexicanus*), and sunfishes (Centrarchidae).

3.6.2 Important Species

3.6.2.1 Recreationally and Commercially Important Species

No commercial fishing occurs in the study area. Sunfish, which are common in the Rio Grande watershed, offer limited recreational potential. Seven species of sunfish may occur, including the warmouth (*Lepomis gulosus*), green sunfish (*Lepomis cyanellus*), bluegill (*Lepomis macrochirus*), and longear sunfish (*Lepomis megalotis*). The largemouth bass (*Micropterus salmoides*) and white crappie (*Pomoxis annularis*) are known from the area, as well as five species of catfish. Only two of the catfish species are considered desirable by fishermen: the channel catfish (*Ictalurus punctatus*) and flathead catfish (*Pylodictis olivaris*).

3.6.2.2 Endangered and Threatened Species

Aquatic endangered and threatened species have been addressed in Section 3.5.2.2 of this report.

3.7 SOCIOECONOMICS

3.7.1 Regional Social and Economic Characteristics

The study area is located in southern Hidalgo County and includes portions of the cities of Granjeno, Mission, and McAllen, as well as the community of Madero. Economic and demographic characteristics for Hidalgo County were determined through a literature survey that included publications of the Texas Workforce Commission (TWC), Texas State Data Center (TSDC), U.S. Bureau of the Census (USBOC), TWDB, and the Texas Comptroller of Public Accounts (TCPA). Due to the inclusion in the study area of portions of the cities of Granjeno, Mission, and McAllen, these municipalities are included in the following discussions. No published data was available for Madero.

3.7.1.1 Population Trends

The study area lies within a region that has experienced one of the strongest growth rates in the United States. The McAllen-Edinburg-Mission Metropolitan Statistical Area (MSA) ranked as the fourth fastest growing MSA in the nation between 1990 and 2000 with a growth rate of nearly 49% (USBOC, 2001). Additionally, Hidalgo County ranked as the 12th fastest growing county in the state, and the 88th fastest growing county in the nation between July 2001 and July 2002 (USBOC, 2003).

As shown in Table 3-4, Hidalgo County's 2000 population of 569,463 more than doubled its 1980 population of 283,229. While the 2000 state population increased by approximately 20% over 1990 levels, the population in Mission and McAllen increased by 59% and 27%, respectively. The City of Granjeno's population was recorded at 313 in 2000 (USBOC, 1983, 1990, 2000).

Population forecasts provided by the TWDB predict continued steady growth within the region. Hidalgo County is expected to reach a population of 744,258 by 2010 while Mission and McAllen are predicted to increase to approximately 61,154 and 127,458, respectively. By 2020, the population in Hidalgo County is predicted to approach 1 million (TWDB, 2003).

3.7.1.2 Environmental Justice

This section was prepared in compliance with EO 12898, Federal Action to Address Environmental Justice (EJ) in Minority Populations and Low-Income Populations, which requires the determination of whether a project would have disproportionately high and adverse human health or environmental effects on low-income populations and minority populations. The EO, signed on February 11, 1994, requires all federal agencies to address the impact of their programs with respect to EJ. The EO requires that low-income and ethnic minority populations not receive disproportionately high adverse human health or environmental impacts and requires that representatives of any low-income or minority populations that could be affected by the project be involved in the community participation and public involvement process.

TABLE 3-4
POPULATION TRENDS AND PROJECTIONS

Place	Recorded Population			Population Projections				Growth Rate		
	1980 ¹	1990 ¹	2000 ¹	2010 ²	2020 ²	2030 ²	2040 ²	1980–1990	1990–2000	2000–2040 ²
Hidalgo County	283,229	383,545	569,463	744,258	948,488	1,177,243	1,424,767	35.4%	48.5%	150.2%
City of Mission	22,551	28,653	45,408	61,154	79,551	100,157	122,454	27.1%	58.5%	169.7%
City of McAllen	66,281	84,021	106,414	127,458	152,045	179,586	209,386	26.8%	26.7%	96.8%
State of Texas	14,229,191	16,986,512	20,851,791	24,890,040	29,072,272	32,988,142	36,762,760	19.4%	22.8%	76.3%

¹ USBOC Data.

² TWDB Projections.

Source: USBOC, 1983, 2003; TWDB, 2003.

Methodology

A five-step methodology was patterned in part after the EJ Evaluation Approach published in the Transportation Research Board's "Environmental Analysis in Transportation" (Shalkowski, 2001). The steps are discussed below.

Step One: Step One is a test of disproportionate effects. A U.S. Census analysis is used to determine whether populations living within the study area exhibit a high proportion of either ethnic minorities or persons living under the line of poverty. An analysis of the relevant census tracts (Figure 3-4) was conducted to complete the disproportionate effects test.

The data used in this test to determine the potential for disproportionate impacts to low-income or ethnic minority populations within the study area are presented in Table 3-5. The information is based on the 2000 USBOC census tract, city, county, and state level data for ethnicity and income. The study area is encompassed within three USBOC-designated census tracts. An average of the three census tracts, the potential EJ Effects Area, is used throughout this discussion.

Also as shown in Table 3-5, in 1999 the EJ Effects Area had a higher percentage of persons living below the poverty line (38.4%) than either of the cities, the county, or the state. Therefore, there is a disproportionate number of low-income residents living within the study area.

Step Two: Step Two provides an evaluation of the findings of the disproportionate effects test. In this step, the findings of Step 1 are assessed and a determination is made to see if the EJ process has been completed or if further studies are necessary. If the potential for disproportionate effects to either ethnic minorities or persons of poverty status does not exist, then documentation of these findings completes the EJ process. However, if the potential for disproportionate effects to either of these demographic groups does exist, then steps 3, 4, and 5 would be necessary to complete the process.

Step Three: Step Three involves the development of a public involvement and outreach program. The goal of the program is to provide a reasonable opportunity for project stakeholders who represent minority and low-income groups that may be disproportionately affected to participate in, and provide input to, the project development process.

Step Four: Step Four involves the evaluation of impacts (positive and negative) on all affected communities and/or stakeholders. This step involves documentation of interests, issues, concerns, and observations that relate to ethnic minority and low-income groups that are expressed in the public involvement and outreach program and in public comments on the draft EA.

Step Five: Step Five is the final step of the EJ process. It involves the development of EJ mitigation measures. According to the EO, the EJ disproportionate effects determination should take into account committed mitigation and enhancement measures and potential offsetting benefits to the affected minority

TABLE 3-5
ETHNIC MINORITY AND POVERTY DISTRIBUTIONS

Place	Total	Percent							Below Poverty Level (1999)	Median Household Income (1999)
		White	Minority				Total Minority Population			
			Hispanic or Latino	Black or African American	American Indian or Alaska Native	Asian				
Census Tracts										
201	9,450	15.4%	84.1%	0.1%	0.0%	0.0%	84.2%	38.9%	\$22,035	
204.02	2,179	22.6%	75.8%	1.5%	0.0%	0.0%	77.3%	15.4%	\$45,000	
213.01	8,314	1.9%	97.9%	0.1%	0.0%	0.1%	98.1%	43.7%	\$19,500	
<i>EJ Effects Area Total/Avg.</i>	<i>19,943</i>	<i>10.6%</i>	<i>89.4%</i>	<i>0.2%</i>	<i>0.0%</i>	<i>0.0%</i>	<i>89.6%</i>	<i>38.4%</i>	<i>\$28,845</i>	
McAllen City	106,211	17.1%	80.1%	0.5%	0.2%	1.8%	82.6%	23.5%	\$33,641	
Mission City	45,920	17.5%	81.3%	0.4%	0.1%	0.3%	82.1%	26.8%	\$30,647	
Hidalgo County	569,463	10.4%	88.4%	0.4%	0.1%	0.5%	89.4%	35.4%	\$24,863	
Texas (in 1,000's)	20,851,820	52.4%	32.0%	11.3%	0.3%	2.6%	46.2%	15.0%	\$39,927	

Source: USBOC, 2000.

and low-income populations. The EJ mitigation measures should reduce or offset adverse community impacts accrued by the proposed action. Mitigation measures are developed through public involvement with affected minority and low-income community leaders and citizen groups. This process involves public participation and is used to minimize adverse community impacts.

The results and documentation of the five-step process is presented in Section 4.5.2 of this document.

3.7.1.3 Economic Trends

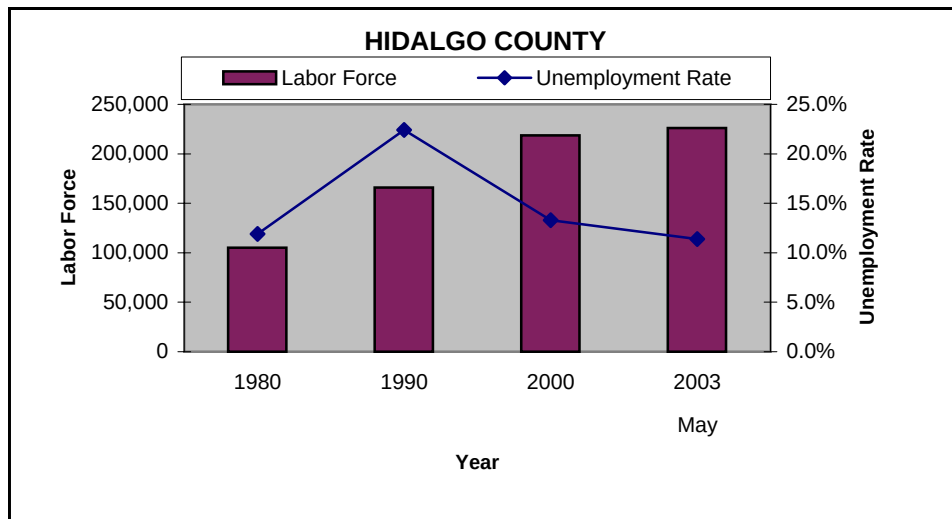
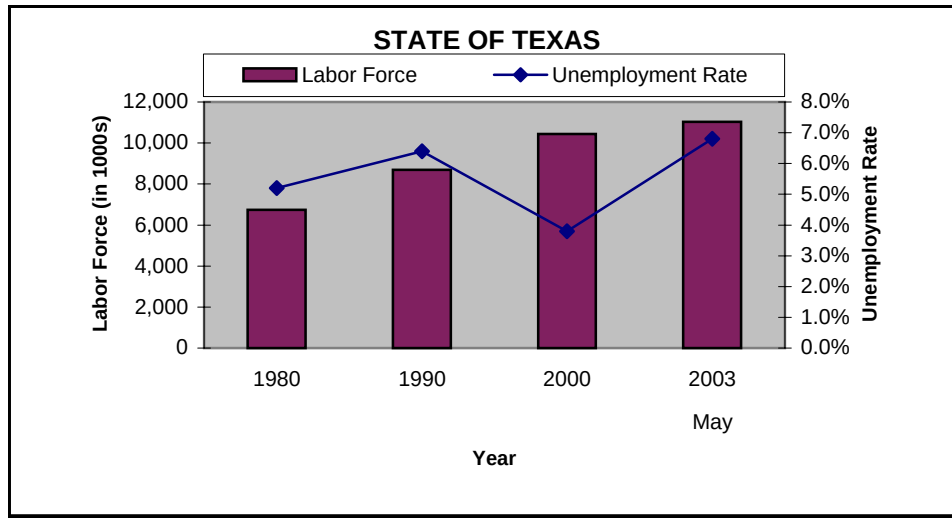
The economy within the study area exhibits many of the disparities that are characteristic to many border cities. Economic development within the region has been enhanced with the implementation of the North American Free Trade Agreement (NAFTA) in 1994. Much of this development is driven by the maquiladoras, which are U.S. or foreign-owned manufacturing facilities that process or assemble components in Mexico and ship them back to the country of origin, usually for more processing and distribution. Between 1988 and September 2001, 168 new companies had set up operations in McAllen, and another 210 had set up across the border in Reynosa. The McAllen-Edinburg-Mission MSA is now home to nearly 100 Fortune 500-company operations (McAllen Chamber of Commerce, 2003). Although the McAllen MSA is outpacing the rest of the nation in job growth, it also consistently ranks as the MSA with one of the highest unemployment rates, and the lowest per capita personal income level. In 2000, The McAllen-Edinburg-Mission MSA again recorded the lowest per capita income of all the MSAs in the nation at \$13,344 (Bureau of Economic Analysis (BEA), 2002). The area's high population growth seems to be the source of the paradox between the booming job market and the continuing stagnant income levels. A recent comparison of the six border cities in Texas found that each city recorded strong employment growth by national and state standards, but that each city's population growth always exceeded the national and state levels. The conclusion reached was that legal and illegal immigration and a high birth rate make it difficult to raise incomes in these six cities, despite what looks like solid economic progress from a labor market perspective (Gilmer, et. al., 2001).

As shown in Figure 3-5, May 2003 TWC employment figures for Hidalgo County report a civilian labor force of approximately 226,080, an increase of 36% from 1990 (TWC, 2003a). A comparison of 1997 and 2002 fourth quarter employment in Hidalgo County shows that covered employment in 2002 had grown by approximately 33,681 jobs over 1997 levels. This represents an increase of 24% in the county, which is more than twice the state increase of 11.5% (TWC, 1997, 2003b). Despite the tremendous job growth, Hidalgo County continues to record one of the highest unemployment rates in the nation. As of May 2003, the county unemployment was recorded at 11.4%.

3.7.1.4 Leading Economic Sectors

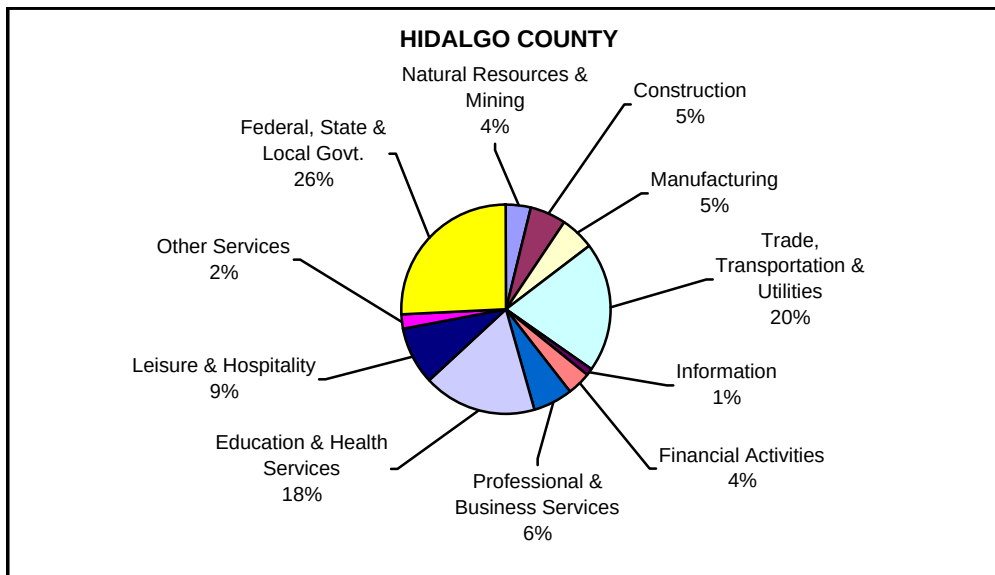
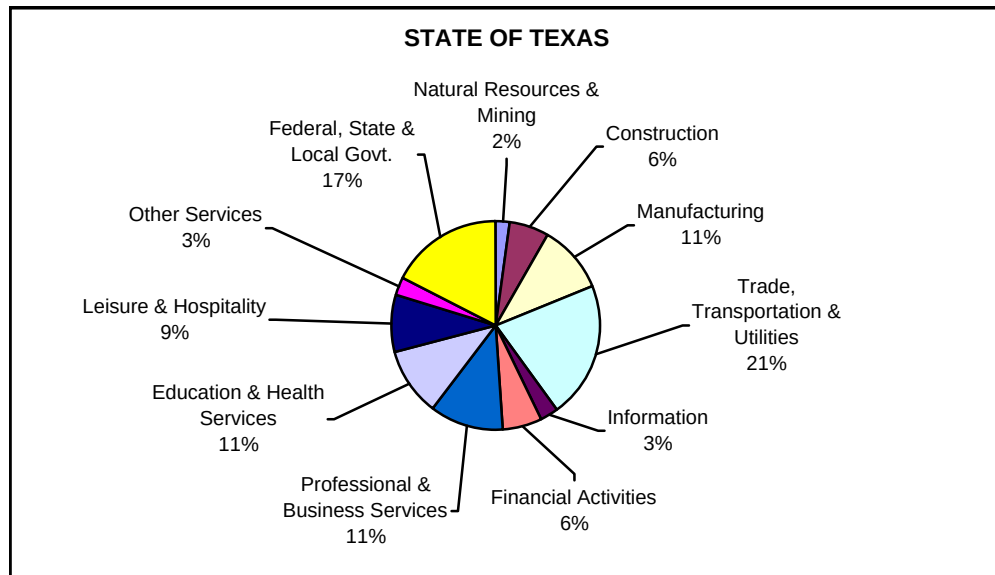
As shown in Figure 3-6, the three leading employment sectors (government; trade, transportation and utilities; education and health services) account for 64% of the jobs in the county. In addition, agriculture remains an important industry within Hidalgo County. Easy access to Mexico and South Padre Island, as

**FIGURE 3-5
CIVILIAN LABOR FORCE AND UNEMPLOYMENT RATE**



Source: TWC: 2003a.

**FIGURE 3-6
COVERED EMPLOYMENT AND MAJOR EMPLOYMENT SECTORS
FOURTH QUARTER 2002**



Source: TWC, 2003b.

well as an increase in world-class birding areas, has contributed to tourism being an important sector within the study area. Oil and gas activity also continues to be an important aspect of Hidalgo County's economy as well.

3.7.1.5 Agriculture

The market value of agricultural products sold in 1997 totaled \$197,235,000, with crop sales accounting for 92% of the total market value. Crops harvested within the county include citrus, cotton, grain sorghum, sugar cane, vegetables, and melons (TASS, 1997).

3.8 LAND USE, AESTHETICS AND RECREATION

3.8.1 Land Use

The study area lies within southern Hidalgo County, and includes portions of the cities of Mission, McAllen, and Granjeno, and the community of Madero. Review of aerial photography (August 2000), USGS topographic maps, and land use data from the 1992 National Resource Inventory (NRI) (NRCS, 1992), confirms that cropland is the dominant land use in the study area. The NRI records show that in Hidalgo County, cropland (most of it irrigated) is the primary land use, accounting for 47% of the county, while rangeland is the second largest land use category, accounting for 28%. Cropland is distributed primarily in the southern two-thirds of the county (which includes the study area), and rangeland is mainly located in the drier, northern third.

Developed land uses account for about 12% of the total county area (NRCS, 1992). Due to dramatic population increases in the region, it is likely that developed land uses within the county have increased to an extent that is not reflected by the information on USGS topographic maps or in available NRCS data. Currently, urban land uses within the study area are limited primarily to the City of Granjeno and the community of Madero.

Land use within the study area is primarily agricultural, with a mix of other developed and undeveloped uses. An approximation of the type and percent cover of land use within the study area is shown below:

- | | |
|-------------------------|-----|
| • Agricultural | 50% |
| • Park, wildlife refuge | 35% |
| • Undeveloped brushland | 5% |
| • Residential | 5% |
| • Commercial/ROW/other | 5% |

A large portion of the study area lies within the boundaries of Hunt Valley Development's Sharyland Plantation, a 2,428.1-ha (6,000-ac) master-planned development that is proposed to include residential, commercial, recreational, and industrial land uses. The design includes numerous neighborhoods, parks,

green spaces, six miles of jogging/biking paths, as well as retail, church, and medical buildings. Major elements of the development that are currently under construction or nearing completion include the Sharyland Business Park and Plantation Grove (including the Mission Sports Center). The business park is a 364.2-ha (900-ac), type A, master-planned facility with approximately 161.9 ha (400 ac) currently under development. Hawthorn Suites, LTD. has completed a facility that includes 101 fully equipped, one-bedroom suites (Hunt Valley Development, 2003).

Another large-scale project that will transform land use within the study area is the Anzalduas International Bridge Project. International border crossings between Texas and Mexico currently rank among the busiest in the nation. In 2001, the crossings in Hidalgo and Brownsville ranked third and fourth in the state, with 368,395 and 251,613 incoming trucks, respectively (Business and Industry Data Center, 2003). Construction of the \$60 million project is expected to begin in 2003 and reach completion in 2005. The bridge will connect the 2,428.1-ha (6,000-ac) Sharyland Plantation with 6,475 ha (16,000 ac) being developed in Reynosa by Grupo Rio San Juan. The proposed design includes four vehicular lanes, a pedestrian walkway, and an 80-ac border port with an initial daily handling capacity of 900 cargo vehicles. The bridge will provide additional infrastructure for the area's expanding maquiladoras operations, and eventually tie into the proposed Interstate Highway 69 on the U.S. side of the border and Highway 40 in Mexico (Grupo Rio San Juan, 2002).

3.8.2 Aesthetics

Consideration of the visual environment includes a determination of aesthetic values (where the major potential effect of a project on the resource is considered visual) and recreational values (where the location of a transmission line could potentially affect the scenic enjoyment of the area). Aesthetic values considered in this study, which combine to give an area its aesthetic identity, include:

- topographical variation (hills, valleys, etc.)
- prominence of water in the landscape (rivers, lakes, etc.)
- vegetation variety (woodlands, meadows)
- diversity of scenic elements
- degree of human development or alteration
- overall uniqueness of the scenic environment compared to the larger region

Generally, the affected portion of the study area exhibits a low to moderate level of aesthetic quality, whether in the developed areas or the predominately agricultural lands. Landscapes with water as a major element, such as the Rio Grande, are often considered to present strong aesthetic values. However, due to the generally low relief of the study area, the lack of public access to the river and the degree to which the native, riparian vegetation has been altered or cleared along the banks, the Rio Grande is not considered as an area of high aesthetic value in this location. In the agricultural portions of the study area, brushy or

wooded areas, although scarce, provide variety and contrast in the visual environment, especially where adjacent to fields and pasture.

TxDOT has mapped 10 separate “Travel Trails” throughout Texas to provide travel routes through different areas of the state, highlighting natural, cultural and scenic attractions. These routes are described in pamphlets distributed by TxDOT offices and tourist information centers and marked by special signs along the designated highways. The “Tropical Trail,” connecting Corpus Christi, Brownsville and Laredo, uses a portion FM 1016 and FM 494 within the study area as part of the overall route. Specific attractions noted within the study area include Anzalduas County Park, La Lomita Chapel, and La Lomita Museum and Farms (TxDOT, n.d.).

3.8.3 Recreation

Based on a review of aerial photography, USGS topographic maps, and TxDOT county highway maps, several parks/recreation areas were identified within the study area. Among these were the following:

Anzalduas County Park and Dam is an international diversion dam located on the Rio Grande in the southwestern portion of the study area. The park offers a boat ramp, picnic areas, and a large pavilion.

La Lomita Chapel, in the vicinity of Alternative B, is a historic site listed on the National Register of Historic Places (NRHP). The historic chapel is located in Capilla de la Lomita Historical Park, a Mission city park located south of Madero, just inside the IBWC levee.

The FWS has embarked on a high-priority program to acquire a wildlife corridor along the Rio Grande as part of the LRGV NWR. FWS is acquiring lands located generally between the IBWC levee and the Rio Grande, from Falcon Dam to the Gulf of Mexico, as well as other tracts that would either provide important habitat, or establish corridors between separate components of the NWR. FWS has already purchased over 36,421.8 ha (90,000 ac), comprised of numerous non-contiguous parcels and negotiations for other lands are ongoing throughout the region. Several tracts of this NWR are located in the southwestern portion of the study area and include the Tortuga Banco, Madero, Granjeno, Gabrielson, and Cottam tracts.

TPWD has also acquired numerous tracts across the Lower Rio Grande Valley that are operated as wildlife management areas (WMA). The Las Palomas WMA is comprised of 23 units (2,289 noncontiguous ha, or 5,656 ac) in Cameron, Hidalgo, and Presidio counties. Eleven of these tracts are in Hidalgo County, but none are located within the study area.

No national parks, national monuments, designated wilderness areas, or national grasslands/forests occur in Hidalgo County. The segment of the Rio Grande that forms the southern boundary of the county (and forms the United States border with Mexico) is not a part of the National Wild and Scenic Rivers System, nor has this stretch of the river been cited in the Nationwide Rivers Inventory (National Park Service

(NPS), 1982), or proposed for inclusion in a state Natural Rivers System. TPWD, however, lists the entire segment of the Rio Grande within the study area as permanently floatable for recreational purposes (TPWD, 1984). In 1998, President Clinton designated the Rio Grande as an “American Heritage River.” This designation is part of a non-regulatory federal program to support local efforts to restore and protect the environmental, economic, cultural, and historic values of selected American rivers. The study area also lies within the Lower Rio Grande Heritage Corridor, a 322-km (200-mile) long corridor along both sides of the Rio Grande from Brownsville past Laredo. The purpose of the corridor is to stimulate and develop “cultural and heritage tourism” throughout the region (THC, 1991). No Indian reservations or other lands owned by Native American groups are located in Hidalgo County. One National Natural Landmark is located in the county: the Santa Ana NWR. This 809.4 ha (2,000-ac) unit of the National Wildlife Refuge System is located on the Rio Grande south of Alamo, outside the study area boundary.

3.8.4 Aviation/Transportation

A review of photography, USGS topographic maps, the Brownsville sectional aeronautical chart (Federal Aviation Administration (FAA), 2003a), the Texas Airport Directory (TxDOT, 2001), and the Airport/Facility Directory for the South Central U.S. (FAA, 2003b) found no public, private, or military airfields or heliports within the study area vicinity. The use of aircraft in support of farming activities is widespread throughout the Lower Rio Grande Valley, including portions of the study area. Airplanes are used for fertilizing and the application of pesticides and herbicides. The necessities of agricultural aviation generally require aircraft to operate at very low altitudes and thus, the location of transmission lines could potentially impact these operations.

Although portions of the study area are located within the city limits of both Mission and McAllen, most of the area is still rural and agricultural, with a network of county roads making up most of the local transportation network. FM 1016 is the major traffic artery within the study area, connecting US 83 in Mission to FM 336 in McAllen. FM 494 connects the community of Granjeno to the local roads and highways. Annual average daily traffic (ADT) numbers for FM 1016 within the study area range between 5,700 (north of Madero) and 8,400 (south of Madero). ADT for FM 494, north and west of Granjeno, is 700 (TxDOT, 2002).

The Rio Valley Switching Company operates approximately 49 miles of rail track in the Lower Rio Grande Valley, including a branch line that runs parallel to portions of FM 1016, FM 494, and Acapulco Avenue, and ends in the McAllen Free Trade Zone, east of the study area.

Although the Rio Grande is listed as a navigable waterway by the USACE, there is no commercial shipping on the river. Boat traffic is limited to individual recreational use and guided tours.

3.9 CULTURAL RESOURCES

3.9.1 Cultural Setting

The study area is confined to a small portion of Hidalgo County, which lies within the Lower Rio Grande Heritage Corridor (Sanchez, 1991), and within the Rio Grande Plains Archeological Region of the Central and Southern Planning Region as delineated by the THC (Mercado-Allinger et al., 1996) and shown on Figure 3-7. The following discussion briefly summarizes each of the major archaeological and historical developmental stages relevant to the study area. Archaeological developments in this part of Texas are usually classified according to four primary chronological and developmental periods: Paleoindian, Archaic, Late Prehistoric, and Historic (includes Historic Indian). These classifications have been defined primarily by changes in material culture over time, as evidenced by the material remains, settlement patterns, and artifacts recovered from archaeological sites. A general theoretical tenet that underlies this classification scheme is that change in material culture reflects behavioral and cultural adaptation to changes in the natural and manmade environment. Historic developmental periods are generally divided according to major shifts in geopolitical control of the area other major economic developments that widely influence land use and occupation patterns.

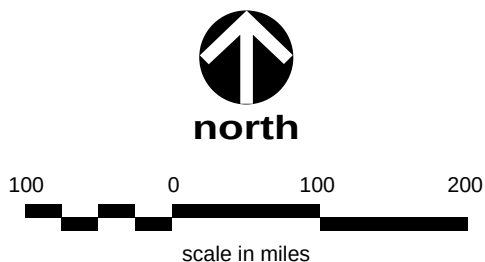
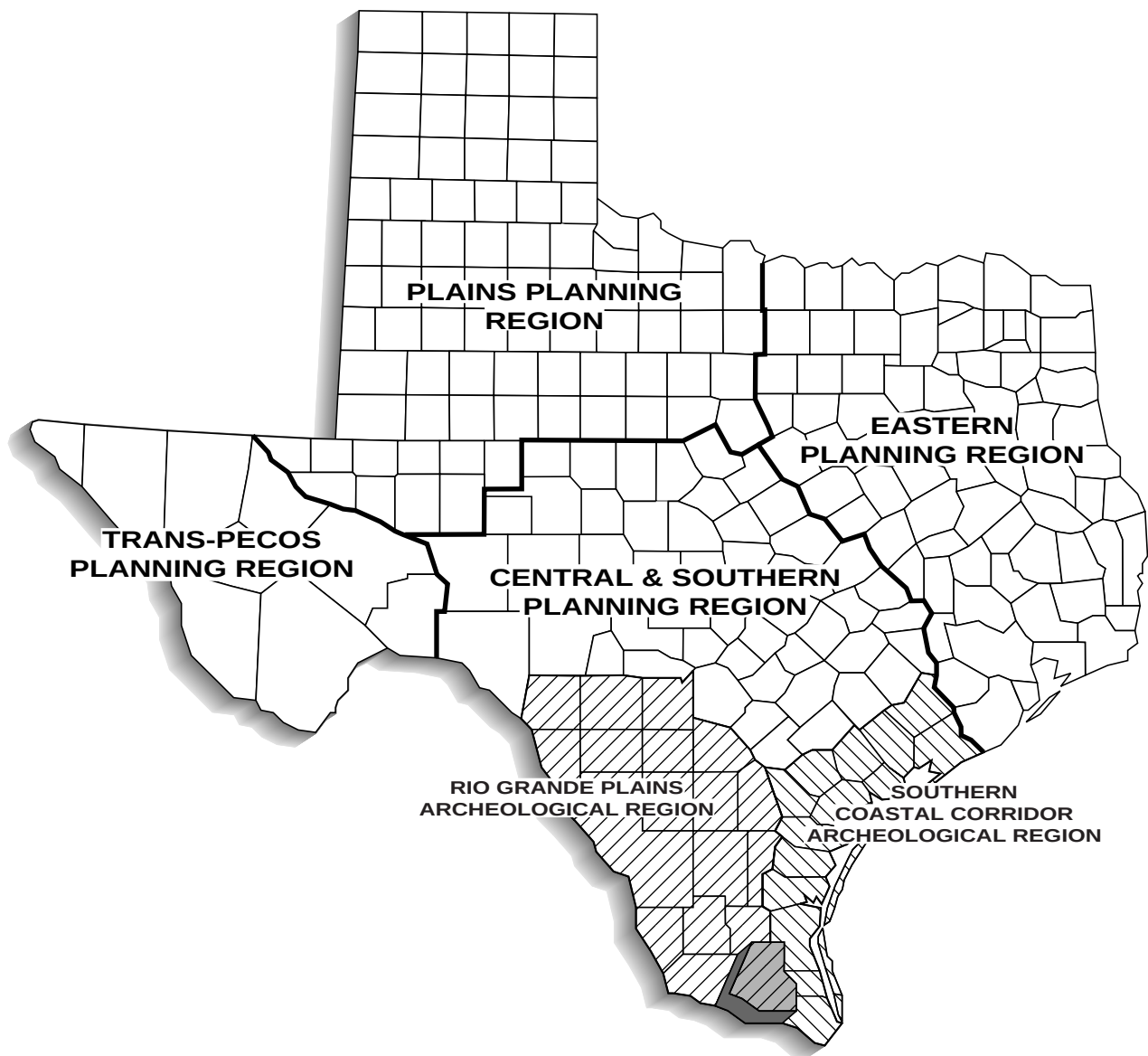
3.9.1.1 Archaeological Developments

The prehistory of the Rio Grande Plains of Texas is poorly understood, in part because archaeological investigations have primarily been limited to surface collections by professional and amateur archaeologists. To date, no extensive controlled excavations have been undertaken in the area and, except for burials occasionally found in the region, definable subsurface components and/or stratigraphy are only rarely found south from Baffin Bay to the Rio Grande. It is possible that resources from any of these periods could occur within the study area, although the likelihood that they may be impacted by the project is impossible to accurately predict.

Paleo-Indian

The earliest evidence of man in the Rio Grande Plains Archeological Region is recognized as the Paleoindian period. This period dates from about 10,000 B.C. to 6,000 B.C. Sites from this period are recognized based on diagnostic dart point types such as *Clovis*, *Plainview*, and *Angostura*. During the Paleoindian period, great expanses of land were inundated by the rising sea levels. The sea levels rose due to the melting of glacial masses at the end of the Pleistocene. The final rise in sea level began about 18,000 years ago, with the present coastline being achieved about 3,000 years ago (Brown et al., 1976).

In the greater south Texas and northeast Mexico area, several Paleoindian sites have been reported, and in a few cases excavated. At Falcon Reservoir, in Starr County, the Evans site on the U.S. side of the Rio Grande yielded an artifact possibly associated with extinct megafauna (Cason, 1952). On the Mexican side of the Rio Grande, archaeologists have found flint debitage and an artifact eroding out of a mammoth



- Engineering
- Environmental Consulting
- Surveying

Figure 3-7

LOCATION OF HIDALGO COUNTY
IN RELATION TO THE
CULTURAL RESOURCES
PLANNING REGIONS OF TEXAS
SHARYLAND - DC MEXICO TIE PROJECT

Source: Mercado Allinger, et al., 1996

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locality (Krieger, n.d.). A *Plainview* point was found at another Falcon Reservoir site (de la Borbolla and Arroyo de Anda, 1953) and excavations by Weir (1956) and Newton (1968) isolated a Paleoindian component at the La Perdida Site, also in Starr County, as identified by *Plainview*, *Meserve*, *Angostura*, *Scottsbluff*, and *Clovis* projectile points. The general location of these discoveries within environmentally and geographically similar portions of northern Mexico and southern Texas suggests that similar Paleo-Indian sites may occur in or near the study area.

Archaic

As the climate changed and the big game animals died out, there was a transition into the Archaic period. Recognized Archaic dart points in the Anderson collection collections made in south Texas by A.E. Anderson between 1908 and 1940 suggested the presence of Archaic peoples in the area; however, no Archaic sites on the lower Texas coast have ever been excavated.

South of the study area, MacNeish (1958) published pertinent information, including a chronology for the Archaic in Tamaulipas, after three seasons of survey and excavation. He considered diagnostic artifacts and geographic distributions in defining three Archaic complexes and phases for northern Tamaulipas. They are, from earliest too latest, the Nogales, Repelo, and Abasolo complexes, and span the period from 5,000 B.C. to A.D. 100. He made comparisons to Archaic materials from Falcon Reservoir, where the Archaic Falcon focus was defined with an estimated temporal span of approximately 5,000 B.C. to A.D. 500 or 1,000 (Suhm et al., 1954). The general location of these discoveries within environmentally and geographically similar portions of northern Mexico and southern Texas suggests that similar Archaic sites may occur in or near the study area.

Late Prehistoric

Following the Archaic, the Late Prehistoric period, termed Neo-American by Suhm et al. (1954), is the last prehistoric period in the Rio Grande Archeological Region. This period is marked by the presence of arrow points in the artifact inventory. Although in many areas of Texas ceramics appear on archaeological sites during this stage, ceramics are relatively scarce in the Lower Rio Grande Valley.

The bulk of our knowledge of the archaeology of south Texas is from the Late Prehistoric this period. MacNeish (1958) has defined two closely related complexes, the Brownsville and Barril, for the Lower Rio Grande delta. Common to both complexes are shell disks, pierced shell disk beads, plugs made from a columella that are round in cross section, rectangular conch shell pendants, mollusk shell scrapers, and *Starr*, *Fresno*, and *Matamoros* projectile points. Intrusive pottery of Huastec origin from southern Tamaulipas appears in occupation sites and in burials (Anderson, 1932; Mason, 1935; MacNeish, 1947). The general location of these discoveries within environmentally and geographically similar portions of northern Mexico and southern Texas suggests that similar Late Prehistoric sites may occur in or near the study area.

Historic Indian (16th century to Ca. 1870)

The term Historic Indian refers to the indigenous people described by the Spanish, who were the first Europeans to explore the coastal region of Texas. The Spanish encountered people speaking the Coahuiltecan language in southern Texas and northeastern Mexico (Salinas, 1990). Research has indicated that the Coahuiltecan probably never existed as a single tribe (Hester, 1999; Gardner, 2001). Rather, groups with similar language were identified by the Spanish as Coahuilteco presumably because the native homeland of many groups was Coahuila, Mexico. Although there is a group based in the San Antonio area that calls itself the Tap Pilam-the Coahuiltecan Nation (Gardner, 2001), there is no federally recognized Coahuiltecan tribe today. This group has filed a petition for recognition by the Secretary of the Interior that the group exists as an Indian tribe (*Federal Register*, 1998).

Historic Indian tribes that have in the past inhabited this part of Texas include the Comanche, Kiowa, and Lipan Apache. The traditional homeland of the Lipan Apache included the area between the Texas Panhandle and the Hill Country of central Texas (Gardner, 2001), but by 1775 they had gained control of south Texas as well (Tyler, 1996). The Comanche came into south Texas in the early nineteenth century following herds of wild mustangs and bison. The general presence of these tribes within south Texas suggests that related sites may occur in or near the study area.

3.9.1.2 Historical Developments

Spanish Exploration and Settlement

The Spanish are recognized as the first European nation to claim territory that encompasses the Lower Rio Grande Valley. Beginning with exploratory expeditions in the early part of the 16th century, their presence in the area for the next 300 years was for the most part limited to brief military expeditions. Though rarely found, archaeological sites dating from this period could occur in or near the study area and would be considered important for their historical and archaeological research value.

No serious attempts were made to colonize the Lower Rio Grande Valley until the mid-eighteenth century when Spanish authorities demonstrated renewed interest in settling land that included the Lower Rio Grande valley, present day Hidalgo County, and northern Mexico. Although originally deemed uninhabitable by the Spanish, between 1749 and 1752 four settlements (Reynosa, Camargo, Mier and Revilla (present day Guerrero)) were founded and large land grants, called *porciones*, were issued along the Rio Grande to prominent Spanish families. One of these original Spanish land grants, called *Rancho La Lomita*, was issued to Joseph Antonio Cantu in 1767. Ranching became the dominant use of the land and small rancheria settlements became scattered across the landscape. Very few surviving ranching operations in the area can be traced continuously back to this period, although abandoned sites from this period could be present and would be considered important for historical and archaeological research.

Mexican Statehood to Independent Republic of Texas

As Spain's claim to the area yielded to Mexico following the Mexican Revolution in 1821, settlement was still sparse except where it became focused around a few key port towns along the Rio Grande. Mexico, like Spain, continued to encourage immigration and settlement in the lower Rio Grande, especially along the navigable stretch of the river as far north as Roma in Starr County. Prior to this, Vera Cruz had served as Spain's sole open port in Mexico, which made the transporting of goods to more remote areas in the colony difficult, expensive, and time consuming. With the opening of a port at Matamoros in 1823, however, trade with the rich hinterlands of northern Mexico was more accessible. The port at Matamoros provided an important means to transport cattle from ranches in the area. As trade increased and Matamoros grew, Americans and Europeans came seeking economic opportunities as merchants (Graf, 1942). Eventually, immigrant Anglos such as the McAllens, and the Kings would adopt many of the traditional Spanish and Mexican ranching practices in developing their own ranches in valley and South Texas.

With the establishment of the port at Matamoros, steamboat service to the area was initiated. However, the difficulty of navigation on the river and the lack of cooperation among merchants in the area stalled early efforts to develop maritime commerce. In the mid to late nineteenth century period, steamboat travel and shipping gained considerable significance. As an indirect consequence, the Rio Grande is known to contain numerous shipwrecks, some of which may occur in the study area.

Mexico did not completely abandon its claim to the Lower Rio Grande Valley as a consequence of the Texas Revolution (1835-1836). Even after Texas was admitted to the United States in 1845, the Rio Grande River was still the subject of an international territorial dispute between Mexico and the United States. Military events associated the Texas Revolution and the American-Mexican War (1846-1848) occurred in the region but outside of the current study area. However, the Old Military Highway generally follows the river, and passes near the study area. Consequently, military sites from the nineteenth century could occur in or near the study area.

After the Treaty of Guadalupe Hidalgo in 1848 defined the Rio Grande as the United States-Mexico boundary, the study area became part of San Patricio County, then later the same year it became part of Cameron County. The formation of Hidalgo County occurred in 1852 (Tyler, 1996). Stock raising continued to provide the primary economic base for the region. However, with the parceling of the original land grants, areas near the Rio Grande grew into villages and the river communities became more involved in transportation, agriculture, and trade with Mexico (Thompson, 1965). In 1852 a village name La Habitation was renamed Edinburgh and made the county seat of Hidalgo County. The first court that convened in Edinburgh granted licenses for ferries to travel across the Rio Grande from the United States to Mexico. The ferries were located at Hidalgo, San Luis, Penitas, and Las Cuevas.

The Rise of the Irrigation Agriculture, Industry and Tourism

Throughout the latter nineteenth century rangeland was vast but crop production was limited to a subsistence level for most of the Rio Grande Valley. However, with the arrival of rail transportation in the early years of the twentieth century the economy and traditional patterns of land use in the valley were dramatically transformed. It suddenly became possible to bring in large-scale pumping equipment needed to irrigate large tracts of fertile land adjacent to the river. Through the efforts of enterprising businessmen and civic leaders, such as John H. Shary, dozens of pumping plants and hundreds of miles of public and private irrigation canals were constructed across the valley. Within the study area is an abandoned segment of the Old Edinburg Canal, part of a canal system operated by Hidalgo County Water Control and Improvement District No. 4. Proximity suggests that this canal provided water for the former Valley Brick and Tile Company and the nearby Madero community. More importantly, the Louisiana-Rio Grande Canal Company Irrigation System, located nearby but outside of the study area, is a National Register-listed landmark that exemplifies the relationship between these industrial operations and non-traditional settlement and employment patterns that developed in the valley during the early twentieth century.

Concurrent with the rise of irrigation agriculture and industry was the development of automotive technology, which, in turn, supported the development of tourism as an alternative industry. Since its early development in the 1920s, tourism has become a significant force in the local economy focusing on the natural and historical resources within the area. Historical places like La Lomita Chapel and Chimney Park (within the study area) have been redeveloped to accommodate the seasonal influx of winter tourists from northern states. Similarly, the establishments of natural parks, like Bentsen-Rio Grande Valley State Park, have served to expand the eco-tourism aspect of the area's economy. This trend toward natural and heritage tourism is being encouraged through studies sponsored by local environmental consortiums (Consortium of the Rio Grande, 1997) and the THC (1991), both of which have surveyed the Lower Rio Grande Valley and made recommendations regarding resources that are naturally and culturally important. For example, the THC's heritage tourism assessment of the lower Rio Grande Valley (Sanchez, 1991) identifies the Hidalgo Irrigation Pump Plant and El Granjeno Cemetery as important visible remnants of the early twentieth century rise of industry and irrigation agriculture and the influence those developments had on the many small river communities. Notably, the lower Rio Grande itself has been nominated as an American Heritage River for its combination of natural and cultural resources that represent the long history of the area.

3.9.2 Results of the Literature/Records Review

The records review and literature search for the Sharyland-Mexico Tie Project in Hidalgo County were conducted at the Texas Archeological Research Laboratory (TARL) at the University of Texas at Austin, and at the THC. The files at TARL were used to identify previously recorded archaeological sites within or near the study area. The files at the THC were used to learn if any sites listed on or determined eligible

for listing on the NRHP are within the study area boundaries. The THC files were also used to identify State Archeological Landmarks (SAL) and State Historical Markers in the vicinity of the study area.

The records at TARL identified 176 recorded archaeological sites in Hidalgo County, none of which are located in the study area. The THC files identified 15 NRHP-listed properties, three of which are historic districts. Based on this information, one of the NRHP-listed historic districts, the La Lomita Historic District, is in the study area. The THC's Texas Historic Sites Atlas website also identifies official state historical markers for the "Spiderweb Railroad" and Juan Davis Bradburn. One branch of the original early twentieth century "Spiderweb Railroad" still runs through the study area although it is now owned and operated by the Southern Pacific railway system. Juan Davis Bradburn was an Anglo military officer who was a leader of Mexican troops in Mexico's early nineteenth century revolution against Spain. His marker reports that his burial location is unknown but may be on the nearby hill called La Lomita.

The registered boundary of the La Lomita Historic District encompassed 49.4 ha of a much larger ranch given to the missionary Oblate Fathers by Rene Guyard, a native of France who acquired the "La Lomita" porcione in 1851 (THC, 1975). The Oblate Fathers constructed a simple chapel in 1865 that was destroyed by flooding and replaced by a second small chapel constructed in 1899 and restored in 1949. Two other significant historic structures on the property include a 2-story frame convent and St. Peter's Novitiate, a grand Mission style structure surmounting the landmark hill for which the original La Lomita ranch was named. Both of these were constructed in 1912, and have since been integrated into a redeveloped teaching complex with multiple bunkhouses, classrooms, and offices. Plans to build greenhouses and cultivate land for row crops were not completed and the hilltop today is densely covered with trees and dense vegetation. Since 1975, when the district was nominated for National Register listing, portions of the 49.4-ha registered site boundary have been subdivided, consequently disconnecting the old La Lomita Chapel, now operated as a city park, from St. Peters Novitiate and the hilltop for which it is named. The La Lomita Chapel and St. Peter's Novitiate are both marked with official state historical markers.

Since the La Lomita Historic District was established, the study area, like much of the Lower Rio Grande Valley, has undergone and continues to undergo dramatic urban and suburban expansion. Only in rare instances do sites like Rancho Toluca near Progreso survive sufficiently intact to represent the valley's Spanish ranching heritage. Similarly, sites representing the missionary heritage are exceedingly rare in the rapidly modernizing environment of the Lower Rio Grande Valley. Among the few surviving mission sites are La Lomita Chapel (1899/1949) and St Peter's Novitiate (1912), both of which have undergone dramatic setting changes and are now cut-off from each other by modern road and levee systems. These sites are increasingly surrounded by residential and commercial development that occupy the mission's former expanse of ranch land.

3.9.3 Archaeological Investigations

In addition to the records review, a review was conducted of previous archaeological survey reports and related literature regarding archaeological investigations in and around the study area. Because very few archaeological investigations have been conducted in the study area, the archaeological literature review examined investigations from across a much wider portion of South Texas and northern Mexico. A full summary of the literature review is provided in Appendix B of this document. For the immediate study area, the most relevant investigations have been those done for local area water control and drainage improvement projects (Prewitt, 1974; Mallouf, et al., 1977; Prewitt and Day, 1981; Etchieson and Boyd, 1982; Mercado-Allinger, 1983; Prewitt and Mercado-Allinger, 1983; Prewitt, 1986; Hall et al., 1987; Quigg et al., 1989; and Bouseman et al., 1990), which recorded hundreds of sites, all outside of the current study area. Within the current study area, EH&A conducted a cultural resources survey of a transmission substation for Central Power and Light Company's proposed 138-kV Sharyland Transmission Line Project (Schmidt, 1998), but no sites were identified.

Because complete archaeological survey information for the present study area is lacking, the area's potential for archaeological resource impacts was assessed through the identification of archaeological high probability areas (HPA). The HPA identification took into account topographic setting, environment, the availability of raw material, water, and subsistence resources, as well as historical maps. Most of the present study area occurs within an expansive alluvial floodplain, the type of setting that favors deposition and burial of intact sites, and thus qualifies as an HPA. Similarly, the area beyond the floodplain has a high probability for containing surficial or shallowly buried archaeological sites and, thus, was also considered to qualify as HPA.

After the preferred alternative (Alternative A) was selected, a pedestrian archaeological survey of the ROW was conducted, as required by the SHPO. The results of the required cultural resource survey are documented in detail in Appendix B of this document. Briefly summarized, no cultural resource sites were encountered in the survey and shovel testing proved negative, suggesting that shallow prehistoric deposits are unlikely to remain intact within the area of potential effect. However, the depth of soils within the HPA nearest the river were sufficient to recommend archaeological monitoring during excavation of transmission pole locations 1, 2, and 3 in order to document any cultural materials that may be displaced from deeply buried contexts. Completed and reported in November 2003, the survey results and recommendations were coordinated with and approved by SHPO (Martin 2004), clearing the project for federal permitting.

4.0 ENVIRONMENTAL IMPACTS

4.1 IMPACTS ON PHYSIOGRAPHY/GEOLOGY/AIR QUALITY/ SOILS

The initial construction and erection of the transmission line structures would require some disturbance and removal of small amounts of near-surface material, but no major impacts to either geologic resources or physiographic features would be anticipated. The soils of the study area would also be minimally impacted. The primary impact would occur with the construction phase of the project. An increased potential for erosion and soil compaction would occur as large equipment is used to install the transmission line. Clearing of the ROW, in the few areas where necessary, could decrease vegetative cover and increase erosion; while extended and continued use of large equipment could compact the soil. Natural revegetation would occur in undisturbed areas affected by construction efforts; farming activities could resume in agricultural/cropland areas.

Although much of the study area is composed of prime farmland soils, minimal impact to these soils would be expected. Alternative Routes A and B would cross areas of prime farmland soils. Construction-related erosion and compaction would occur; however, only small areas directly beneath the structures would be permanently removed from crop production. This would constitute a very small portion of the cropland/prime farmlands within the study area.

During construction of the proposed transmission line, air emissions would result from the operation of construction equipment and the generation of dust during construction activities. Construction equipment emits NO_x, VOC, CO, SO₂ and PM from the combustion of fuels. The movement of dirt produces dust or PM emissions to the air. It is expected that air contaminant emissions from construction activities would likely result in minor short-term impacts on air quality in the immediate vicinity of the project site, including increased levels of particulate matter and vehicular exhaust emissions. However, due to the relatively short duration of construction, long-term impacts would not be expected to adversely impact the air quality in the area.

4.1.1 No Action Alternative

Under this alternative, no impacts as a result of the project would occur. Changes to the soil would be limited to biological processes and changes in land use practices. Soil productivity would be affected naturally through leaching and weathering, but the effects would be negligible.

4.1.2 Applicant's Preferred Alternative (Route A)

Route A is the shorter of the two alternative routes (approximately 1,356.4 m or 4,450 ft) and crosses approximately 1,295.4 m (4,250 ft) of prime farmland soils. Construction-related erosion and compaction could occur but only very small areas (37.4 square meters (sq m) or 402.4 square feet (sq ft)) immediately

beneath the structures would be unavailable for use. Since the preferred route crosses no land currently used for farming, no prime farmland soils would be removed from crop production. The surface area of soil to be removed from potential production would include the area physically occupied by the structures plus any additional area removed from production as a result of limited access by farm equipment around the base of structures. The 2.8-ha (7-ac) converter station site would be permanently removed from crop production.

4.1.3 Route B

The general impacts would be similar to Route A except that Route B is longer (approximately 1,905 m or 6,250 ft) and crosses approximately 1,691.6 m (5,550 ft) of prime farmland soils (including 563.9 m (1,850 ft) of land currently used as cropland). Thus, impacts resulting from soil compaction, erosion, and loss of productivity would be greater than those from Route A, the bases of the structures taking up approximately 46.7 sq m, or 503 sq ft.

4.2 IMPACTS ON WATER RESOURCES

4.2.1 Surface Water

If the proposed transmission line is constructed, the surface water regime of the study area would remain almost unchanged from existing conditions; few impacts, if any, would be anticipated. Storm runoff, flow duration, low flow, and water quality characteristics should not experience any major alterations. Both alternatives must cross the Rio Grande. Additionally, both alternatives cross irrigation canals. All of these features are of a size and extent that can be spanned by the proposed project.

The main potential impact on surface waters from any major construction project is pollution resulting from erosion, and the accidental spillage of petroleum or other chemicals. Chemicals used during construction would include cleaners, paint, glues, etc. Electrical transformers and breakers at the converter station would use mineral oil. A sterilizing herbicide would be used on the converter station site for the control of weeds in and around the concrete slabs. Vegetation removal would likely be minimal, but could result in increased erosion potential of the affected areas, so that slightly higher-than-normal sediment yields could be delivered to drainages during a heavy rainfall. However, these short-term effects would likely be minor as a result of the relatively small area to be disturbed at any particular time and the short duration of the construction activities. A Storm Water Pollution Prevention Plan (SWPPP) would be prepared for the project, as required by the Texas Pollution Discharge and Elimination System (TPDES), and a Notice of Intent (NOI) would be filed with the TCEQ. Sharyland would use standard erosion-control measures (possibly including silt fences, hay bales, brush berms, etc.) to control erosion from construction areas that are adjacent to water bodies.

Alternative Routes A and B are located within the 100-year floodplain of the Rio Grande. Where it is necessary to locate transmission line structures within floodplains, they would be designed and

constructed so as not to impede the flow of any waterway or create any hazard during flooding, and be in compliance with IBWC requirements. These requirements include: minimum vertical clearances over levee crowns and the floodway design high water level; minimum horizontal distances from the toe of a levee and channel banks; and maintenance requirements for structures and ROW. Additional details of these requirements are included in the IBWC correspondence in Appendix A of this document. Construction activity in floodplains could result in erosion and sedimentation impacts, especially if flooding occurs during the construction period. Support structures and maintenance access routes in the floodplain should not significantly affect flooding if not located in obvious flood channels. Some scour may occur around structures if flood-flow depths and velocities become great enough. Careful siting of structures, however, should eliminate the possibility of significant scour. Neither Alternative Routes A or B are expected to have significant impacts on the function of the floodplains and no adverse effects from flooding to adjacent or downstream property owners would be anticipated.

4.2.1.1 No Action Alternative

Changes would be limited to biological and natural processes. Sedimentation as a result of soil disturbance through agricultural practices and natural erosion would continue. Effects would be negligible.

4.2.1.2 Applicant's Preferred Alternative (Route A)

Route A is the shorter of the two alternatives (approximately 1,356.4 m, or 4,450 ft). Therefore, this alternative would have less potential impact from pollution resulting from erosion or the accidental spillage of petroleum or other chemicals, than Route B. Route A would cross the lesser amount of 100-year floodplain (approximately 198.1 m, or 650 ft) and, therefore, would have less potential impact. It also crosses approximately 94.5 m (310 ft) of open water (river and canal).

4.2.1.3 Route B

Route B is approximately 1.3 times longer than Route A and thus would have more potential for impacts. It would cross approximately 457.2 m (1,500 ft) of 100-year floodplain and 155.5 m (510 ft) of open water (river and canal).

4.2.2 Groundwater

Potential impact on groundwater from construction activities associated with the project would possibly be contamination from the accidental spillage of petroleum products. Care would be exercised in the storage and handling of petroleum products, especially near waterways. The No Action Alternative would result in continued impacts from land-use activities and natural and biological processes. The relative impacts of Alternatives A and B would be similar in degree to those described for surface water, above.

4.2.3 Floodplain/Wetland Assessment

This assessment of potential floodplain/wetland effects of the proposed project is included in this EA in accordance with DOE requirements in 10 CFR 1022.

4.2.3.1 Project Description

The nature and purpose of the proposed project are described in sections 1 and 2. The FEMA-mapped floodplains in the vicinity of the proposed route and the area of floodplain that would be affected by the proposed project are shown in Figure 2-3 (map pocket). Some transmission towers may be located in the floodplain. The “high hazard area” of a floodplain is described in 10 CFR 1022 as “those portions of riverine and coastal floodplains nearest the source of flooding which are frequently flooded and where the likelihood of flood losses and adverse impacts on the natural and beneficial values served by floodplains is greatest.” Tower emplacement is not expected to occur in high hazard areas.

4.2.3.2 Floodplain/Wetlands Effects

Actions that would affect the 100-year floodplain would be construction of support structures for transmission towers, if necessary. Should the need for floodplain construction be required, Sharyland would comply with the requirements of the IBWC. Construction activity in floodplains could result in erosion and sedimentation impacts, especially if flooding occurs during the construction period. Support structures and maintenance access routes in the floodplain should not significantly affect flooding if not located in obvious flood channels.

4.2.3.3 Alternatives

All of the land in the study area, adjacent to the Rio Grande River, contains floodplains. The locations of the proposed transmission towers are constrained by the connection points to transmission lines in Mexico, south of the Rio Grande River. Neither Alternative Routes A or B are expected to have significant impacts on the function of the floodplains and no adverse effects from flooding to adjacent or downstream property owners is anticipated.

4.3 IMPACTS ON TERRESTRIAL ECOSYSTEMS

4.3.1 Vegetation

The primary impact to vegetation resulting from site preparation and construction of the proposed transmission line would be the removal of existing woody vegetation or danger trees from the areas required for the ROW. The greatest amount of clearing of vegetation would be required in brushland and riparian woodland, while minimal clearing would be necessary in cropland or pastureland. Within cropland and pastureland, the ROW may be temporarily unavailable for cultivation or grazing during

construction. Once construction is completed, the ROW could be used as the landowner desires. The only land lost to cultivation would be that occurring immediately beneath the structures.

Very little native vegetation would be removed along either of the alternatives. The study area consists almost entirely of cultivated or developed land. Some native vegetation is extant; however, these areas would generally be avoided. Along the banks of the Rio Grande, any vegetation clearing would be done by hand to a height below that of the conductors.

Potential jurisdictional waters, which include hydric habitats associated with rivers, streams, canals, impoundments, and depressions, may also be impacted by construction of the transmission line. These areas would be spanned such that support structures would not be placed within sensitive hydric communities.

4.3.1.1 No Action Alternative

Species composition would continue to change slowly as a result of natural succession and from natural occurrences such as wildfires, floods, and disease. Species composition would change more rapidly through agricultural practices such as brush clearing.

4.3.1.2 Applicant's Preferred Alternative (Route A)

Route A would require very little clearing of vegetation, as it crosses no brushland/woodland or thornscrub, which provides habitat for the endangered ocelot and jaguarundi. It would also cross a water of the U.S. (Rio Grande). Since the average span distance between structures would be approximately 121.9 to 198.1 m (400 to 650 ft), the river would be spanned without placing structures in the jurisdictional area, thus minimizing potential impacts.

4.3.1.3 Route B

Route B would require some vegetation clearing (crossing approximately 73.2 m (240 ft) of brushland/woodland) and would also cross a water of the U.S. (Rio Grande). The river would be spanned without placing structures in the jurisdictional area, thus minimizing potential impacts.

4.3.2 Endangered and Threatened Plant Species

As mentioned in Section 3.4.3, one federally endangered species, Walker's manioc, has been recorded from the study area. The approximate location of this species, in the southwest portion of the study area, could be equally close to both routes. Several other species, including the federally endangered Texas ayenia, have been recorded from Hidalgo County and are thus of potential occurrence in the study area. In all, three federally endangered plant species (Walker's manioc, star cactus, and Texas ayenia) and six federal SOCs have been recorded from Hidalgo County and, thus, are of potential occurrence within the alternative ROWs if suitable habitat occurs. The federal SOCs, however, have no legal federal protection

under the ESA. Field surveys during the time when these plant species are identifiable (usually during their flowering season) would reveal whether any populations occur within the ROW. If endangered plant species are found in areas that cannot be avoided during construction, individual plants could be fenced for protection or transplanted. No surveys for these species have been conducted within the proposed ROW.

4.3.3 Wildlife

The impacts of transmission lines on wildlife can be divided into short-term effects resulting from physical disturbance during construction and long-term effects resulting from habitat modification. The net effect on local wildlife of these two types of impacts is usually minor. A general discussion of the impacts of transmission line construction and operation on terrestrial wildlife ecology is presented below, followed by a discussion of the possible impact of each alternative route.

Clearing and construction would directly and/or indirectly affect most animals that reside or wander within the transmission line ROW. Heavy machinery could kill some small, low-mobility forms. These include several species of amphibians, reptiles, mammals and, if ROW clearing occurs during the breeding season, the young of many species including nestling and fledgling birds. Fossorial animals (i.e., those that live underground) could be negatively impacted as a result of soil compaction caused by heavy machinery. Larger, more-mobile species such as birds, coyotes, and squirrels would likely avoid the initial clearing and construction activities and move into adjacent areas outside the ROW. Wildlife in the immediate area could experience a slight loss of browse or forage material during construction; however, the prevalence of similar habitats in adjacent areas and re-growth of vegetation in the ROW following construction would minimize the effects of this loss.

The increased noise and activity levels during construction would potentially disturb breeding or other activities of species inhabiting the areas adjacent to the ROW. However, these impacts would be temporary. Although the normal behavior of some wildlife species would be disturbed during construction, little long-term damage to the populations of such organisms would be expected.

Once construction is completed and the vegetation recovers, most forms of wildlife would be expected to move back into the ROW. Periodic clearing, while producing largely temporary negative impacts to some wildlife, improves the habitat for ecotonal or edge species, such as the eastern cottontail, white-tailed deer, and northern bobwhite, with increased production of small shrubs, perennial forbs, and grasses.

Transmission line structures can benefit some bird species, particularly raptors, by providing nest sites and hunting perches. One of the more common species that uses such structures for nesting is the red-tailed hawk (*Buteo jamaicensis*). The greatest use, however, is for hunting perches (Olendorff, et al., 1981). The wires and structures could increase the number of roosting (or perching) sites over parts of the transmission line route for such species as the red-tailed hawk, American kestrel (*Falco sparverius*), mourning dove, loggerhead shrike, and meadowlarks (*Sturnella* spp.). The danger of electrocution to

birds would not be expected to be significant since the distance between conductors or conductor and structure or ground wire on 138-kV transmission lines is usually greater than the wingspan of any common bird in the area (i.e., greater than 1.8 m, or 6 ft).

The transmission line (both structures and wires) would present a hazard to flying birds, particularly migrants. During a workshop on impacts of transmission lines on birds in flight, it was concluded that mitigation may best be accomplished by the initial siting of transmission line routes (Avery, 1978). Because small birds such as passerines tend to migrate at lower altitudes than large birds (Tucker, 1975, cited by Gauthreaux, 1978), their potential for collisions should be greater. Most migrant species, however, including passerines, should be minimally affected during migration since their normal flying altitudes are greater than the heights of the proposed transmission structures (Willard, 1978; Gauthreaux, 1978). Large birds are more prone to collisions, because their large wingspans and lack of maneuverability make avoiding obstacles more difficult (Avian Power Line Interaction Committee (APLIC), 1994).

Collisions tend to increase in frequency during the fall when migrating flocks are denser and flight altitudes are lower in association with cold air masses, fog, and inclement weather. The greatest danger of mortality exists during periods of low ceiling, poor visibility, and drizzle, when birds are flying low, perhaps commencing or terminating a flight, and may have difficulty seeing obstructions. For resident birds or for birds during periods of non-migration, those most prone to collision are often the largest and most common in a given area (Rusz et al., 1986; APLIC, 1994). Resident birds, or those in an area for an extended period, learn the location of powerlines and become less susceptible to wire strikes (Avery, 1978). Raptors, typically, are uncommon victims of transmission line collisions due to their great visual acuity (Thompson, 1978). In addition, many raptors only become active after sufficient thermal currents develop, which is usually late in the morning when poor light is not a factor (Avery, 1978).

Powerlines within daily use areas are responsible for most bird collisions. Waterfowl species are vulnerable because of their low altitude flight and high speed. Species that travel in large flocks, such as blackbirds and many shorebirds, are also vulnerable, since dense flocks makes movement around obstacles more difficult for individuals in the flock (APLIC, 1994).

Several means can be employed to minimize transmission line impacts on birds in flight. The initial placement of a transmission line is the most important consideration (Avery, 1978; APLIC, 1994). The proximity of a transmission line to areas of frequent bird use is crucial. This is especially true for daily use areas (such as feeding areas) or other areas where birds may be taking off or landing regularly (APLIC, 1994). The position of the individual structures can also help reduce collisions. Faanes (1987), in an in-depth study in North Dakota, found that birds in flight tend to avoid the transmission line structures, presumably because such structures are visible from a distance; most appear to fly over the lines in the mid-span region. In areas where the transmission line passes between roosting and foraging areas, the

structures can be placed in the center of the flyway (i.e., where the birds are more likely to fly) to increase their visibility, in addition to heavily marking the wires.

The configuration of wires of a transmission line, including the ground wires, also should be considered. Faanes (1987) reported that 97% of birds observed colliding with a powerline did so with the ground wire, largely as a result of trying to avoid the conductors. Beaulaurier (1981) found that removal of the ground wire at two study sites in Oregon resulted in a reduction in collisions of 35% and 69%. Lines grouped more into a horizontal plane are generally better than lines grouped in a vertical plane (APLIC, 1994).

Increasing the visibility of the wires by using markers such as orange aviation balls, black-and-white ribbons or spiral vibration dampers, particularly at mid-span, has been shown to reduce the number of collisions. Beaulaurier (1981) reviewed 17 studies involving marking ground wires or conductors and found an average reduction in collisions of 45% compared to unmarked lines.

Waterfowl are among the birds most susceptible to wire strikes (Faanes, 1987) and yet, despite these hazards, it has been estimated that wire strikes (including lower voltage distribution lines) account for less than 0.1% of waterfowl non-hunting mortality, compared to 88% from diseases and poisoning and 7.4% due to the weather (Stout and Cornwell, 1976). In some areas, hunting affects 20 to 30% of waterfowl populations (Thompson, 1978).

In general, because vegetation provides habitat for wildlife, the preferred route from a vegetation standpoint is usually also the preferred route from a wildlife standpoint. In the study area, the greatest potential impact to wildlife would primarily result from the clearing of brushland/woodland habitat, having the ROW parallel and within 100 ft of canals/rivers, and crossing riparian areas and wetlands.

4.3.3.1 No Action Alternative

Impacts to wildlife would be limited to biological changes and changes resulting from continued agricultural and other land use practices. Any brush clearing that took place as a result of these activities would reduce habitat for certain species. Effects would be negligible.

4.3.3.2 Applicant's Preferred Alternative (Route A)

Route A traverses no brushland, woodland, or riparian habitats. Route A crosses approximately 94.5 m (310 ft) of open water; however, these areas would be spanned. In general, the longer the route the greater the potential impact for avian mortality through wire strikes. In this regard, Route A, being the shortest, is the preferred alternative.

4.3.3.3 Route B

The greatest diversity of wildlife species probably occurs in the brushland, woodland, and riparian habitat types. Route B crosses approximately 73.2 m (240 ft) of brushland/woodland and 155.5 m (510 ft) of open water. Again, these areas would be spanned, thus minimizing impacts.

Route B, being approximately 1,905 m (6,250 ft) in length, is the least desirable from an avian wirestrike perspective.

4.3.4 Endangered and Threatened Wildlife

No impacts to any of the endangered, threatened, or SOC avian species mentioned in Section 3.5.2.2 are anticipated. The federal SOC northern gray hawk, tropical parula, and loggerhead shrike, and the state-threatened zone-tailed hawk, northern beardless-tyrannulet, and rose-throated becard have been recorded within the study area (TXBCD, 2003; Sarkozi, 2002). Many of the listed species are unlikely to occur in the study area except as rare migrants or occasional visitors.

Of the non-avian species in Table 3-3, only the federally endangered jaguarundi and state-threatened river goby have been recorded from the study area (TXBCD, 2003). The federal SOC and state-threatened black-spotted newt, and the state-threatened sheep frog, South Texas siren, Texas indigo snake, and black-striped snake have been recorded from the vicinity of the study area (TXBCD, 2003). These, together with the subtropical blue-black tiger beetle, the Rio Grande lesser siren, the reticulate collared lizard, Texas horned lizard, Coues' rice rat, Mexican treefrog, white-lipped frog, Texas tortoise, speckled racer, and northern cat-eyed snake are typical of low-mobility forms that may be impacted during the initial clearing and construction phases of the project if the species should occur along the ROW. However, the likelihood of impact is minimal and short-term, and the project would not constitute a serious threat to any populations of these species.

The federally endangered jaguarundi has been reported from the study area (TXBCD, 2003) and records of the federally endangered ocelot are known from the vicinity of the study area. Photographs, carcasses, or trapped individuals have not supported these sightings; however, sufficient sightings from reliable observers exist to acknowledge these species' presence is possible. A jaguarundi was sighted in early 1993 by TPWD biologist Gary Waggenerman on the FWS tract just south of the Anzalduas Dam, within the study area (Waggenerman, 1994). In addition, both species have been reported from nearby Bentsen-Rio Grande State Park and Santa Ana NWR (outside the study area). According to the recovery plan for the ocelot and jaguarundi (FWS, 1990b), any area, except for human habitations, within a 16.1-km (10-mile) radius of an ocelot or jaguarundi occurrence is considered occupied habitat (i.e., the areas are considered to be occupied by ocelots/jaguarundis at some time of the year). The 16.1-km (10-mile) radius accommodates the known movement pattern of ocelots/jaguarundis. If the endangered cat sightings in the project area and vicinity are accurate, the entire study area, except for human habitations could be considered occupied habitat. In addition, a 16.1-km (10-mile) radius from Waggenerman's 1993 jaguarundi

sighting would include the entire study area. Thus, any brushland tracts in the study area, particularly those within or adjacent to FWS refuge land or along the Rio Grande, are potential habitat for these two species. Even small patches of brushland habitat in the study area may provide temporary refuge for jaguarundis, and perhaps ocelots, dispersing between the few large tracts of native woodland and brushland still extant along the Rio Grande. During construction of the line, any jaguarundis or ocelots in the vicinity would likely avoid the areas of construction.

Potential habitat for these two endangered species in the study area, although limited in extent, was generally avoided when developing the routing alternatives. No potential brushland would be crossed by the Applicant's Preferred Route (Route A) and Route B crosses only 73.2 m (240 ft) of brushland, which would be spanned. Therefore, no long-term or permanent impacts to either the ocelot or jaguarundi are anticipated as a result of the project.

4.3.5 Critical Habitat

Since no designated critical habitat for any endangered or threatened species of plant or animal occurs in the study area, the proposed project would not impact critical habitat.

4.4 IMPACTS ON AQUATIC ECOSYSTEMS

The impact on aquatic flora and fauna is expected to be minimal. No major impact on fish or other aquatic organisms in the Rio Grande, canals or ponds as a result of the proposed action is anticipated, since these aquatic environments would generally be avoided or spanned. Impacts to be expected at the river, canal, and stream crossings are primarily those associated with temporary erosion and turbidity. The greatest potential for impacts to aquatic features are primarily from erosion in the vicinity of the river, canal, and stream crossings. Alteration of water quality as a result of particulate loading caused by direct mechanical damage from workers and equipment operating in streambeds, by clearing of riparian vegetation, and by siltation from erosion in newly disturbed areas, could also have effects on downstream areas. With appropriate erosion-control measures used during construction, these short-term effects would be expected to be minor as a result of the relatively small area to be disturbed at any particular time and the short duration of the construction activities. Similarly, while spillage of petroleum products directly into a water body could cause some minor temporary effects, careful construction practices would minimize this potential impact. No herbicides or other chemicals that might otherwise enter the aquatic system and negatively impact the aquatic communities would be used in association with the project. No impacts to any endangered or threatened aquatic flora or fauna would be anticipated. The applicant and its contractors would use standard erosion-control measures (including silt fences, hay bales, brush berms, etc.) to protect aquatic ecosystems during construction.

4.4.1 No Action Alternative

Changes would be limited to biological and natural processes. Sedimentation as a result of soil disturbance through agricultural practices, including vegetation removal in riparian areas, would continue. Effects would be negligible.

4.4.2 Applicant's Preferred Alternative (Route A)

Of the two alternatives, Route A has the least potential for aquatic impacts, although it would cross one water of the U.S. (Rio Grande). No potential wetlands would be crossed. It would also cross approximately 94.5 m (310 ft) of open water (river and canal). These areas would all be spanned.

4.4.3 Route B

Route B would cross one water of the U.S. (Rio Grande), but no potential wetlands. It would also cross approximately 155.5 m (510 ft) of open water (river and canal). These areas would all be spanned.

4.5 SOCIOECONOMIC IMPACTS

4.5.1 Socioeconomic Effects

For this project, minimal short-term local employment would be generated. Sharyland normally uses contractors during the clearing and construction phase of transmission line projects. A portion of the project wages would find their way into the local economy through purchases such as fuel, food, lodging, and possibly building materials. ROW easement payments would be made to individuals whose lands are crossed by the transmission line based on the appraised land value, and this would result in increased income to those landowners. Sharyland is also required to pay sales tax on purchases and is subject to paying local property tax on land or improvements. Since Sharyland would only require easements for the proposed line, none of this land would be taken off the tax rolls. The cost of permitting, designing, and constructing the line would be paid for through revenue generated by the sale of electrical service.

The transmission line portion of the project would employ two 4-man crews and one contract Crew Foreman. The converter station would have several different crews performing basic construction, as well as very specialized construction. These crews would construct the main building to house the converter unit, assemble the converter equipment, test the equipment, install security fencing, clean the premises and other basic construction tasks. There could potentially be as many as 20 workers on site at any time. The number of construction workers may vary according to work plan.

The proposed construction schedule calls for approximately 11 months of actual construction time on the converter station after all engineering and procurement is complete. Actual construction would likely start in June 2005 and be complete by May 2006. Work would progress throughout the year in all seasons.

Potential long-term economic benefits to the community resulting from construction of this project are based on the necessity for electric utilities to provide an adequate and reliable level of power throughout their service areas. Economic growth and development rely heavily on adequate public utilities, including a reliable electrical power supply. Without basic infrastructure a community's potential for economic growth is constrained.

4.5.2 No Action Alternative

If the proposed project is not approved, the existing (domestic) regional 138-kV transmission system could experience substantial congestion and reliability problems. In the absence of the proposed project, electric utilities in south Texas could incur RMR costs, as the existing transmission system may be inadequate under certain contingency situations. Economic benefits to both the U.S. and Mexican electrical systems, including improved service reliability and the development of markets to trade power across the border, would also not occur at this location.

4.5.3 Environmental Justice Evaluation

Step One: Disproportionate Effects Test – Census Tract Analysis

The EJ Effects Area exhibits a disproportionately high percentage of ethnic minorities because over 50% of the population is classified as minority. Data for the nearby cities of McAllen and Mission, Hidalgo County, and the State of Texas were used for comparison purposes.

As shown in Table 3-5, the EJ Effects Area has a total minority population of 89.6%, which is a higher rate than the cities of McAllen and Mission and the State of Texas, and slightly higher than Hidalgo County. There are no Native American communities located within the study area.

The EJ Effects Area also contains a disproportionate number of low-income residents (38.4%) when compared to the cities of Mission and McAllen, and the State of Texas. The percentage of low-income residents is only slightly higher than that of Hidalgo County. This level is sufficient to trigger an analysis of potential disproportionate environmental or human health impacts to this population.

Step 2 – Evaluation of Findings of the Disproportionate Effects Test

The determination of whether disproportionately high and adverse human health or environmental effects would impact the minority and low-income populations within the EJ effects Area was based on the determination of potential impacts addressed in this EA. Since the EA has found no verifiable adverse human health effects will likely result from the construction or operation of this project, there will be no such effects on either the minority or low-income populations addressed. Likewise, since there will be no significant, adverse impacts to the ecological, cultural, human, economic, or social environments within the EJ Effects Area, and only minor and temporary impacts within or adjacent to the actual ROW (which

is generally unpopulated), there will be no significant adverse environmental effects to either of these two populations, as described in EO 12898. Because no disproportionately high and adverse human health or environmental effects to low-income and minority populations living in the study area was found, steps 3 through 5 are not necessary.

4.6 IMPACTS ON LAND USE, AESTHETICS AND RECREATION

4.6.1 Land Use

Land use impacts from transmission line construction are usually determined by the amount of land (of whatever use) displaced by the actual ROW and by the compatibility of electric transmission line ROW with adjacent land uses. During construction, temporary impacts to land uses within the ROW could occur due to the movement of workers and materials through the area. Construction noise and dust, as well as temporary disruption of traffic flow, could also temporarily affect residents and businesses in the area immediately adjacent to the ROW. Coordination between Sharyland, contractors, and landowners regarding access to the ROW and construction scheduling could minimize these disruptions.

The primary criteria considered to measure potential land use impacts for this project included proximity to habitable structures (i.e., residences, businesses, schools, churches, hospitals, nursing homes, etc.), overall length, length using or paralleling existing transmission line ROW, and length parallel to other existing ROW (roads, utilities, canals, etc.).

One of the more important measures of potential land use impacts is the number of habitable structures located within the vicinity of each route. The number of, and distance to, habitable structures along each route was determined by evaluating and measuring aerial photographs and ground-truthing that information in the field, where possible.

The least impact to land use generally results from locating new lines either within, or parallel to, existing transmission line ROW. However, when existing transmission line ROW is not available, paralleling other existing compatible ROW is also generally considered a positive routing criteria.

Agriculture comprises a good portion of the land use within the study area and along alternative routes A and B. Potential impacts to agricultural land uses include the disruption or preemption of agricultural activities. Disruption includes the time lost going around or backing up to structures in order to cultivate as much area as possible and the general loss of efficiency compared to plowing or planting unimpeded in straight rows. Preemption of agricultural activities refers to the actual amount of land lost to production around the base of the structure. Construction activities associated with the proposed project could slightly impact agricultural production, depending on the timing of activities. However, due to the relatively small area affected and the short duration of construction activities, agricultural impacts would be minor.

Since the ROW for this project would not be fenced or otherwise separated from adjacent lands, there would be no long-term or significant displacement of farming or grazing activities. Most existing agricultural land uses could be resumed following construction. No crop or pasture land irrigated by circle-pivot or other above-ground mechanical means would be crossed by routes A or B.

Finally, the overall length of a particular alternative route can be an indicator of the relative level of land use impacts. That is, generally (all other things being approximately equal), the shorter the route, the less land is crossed and the fewer potential impacts would result.

4.6.1.1 No Action Alternative

Under this alternative, current land use practices would continue. Any land use impacts as a result of the project would not occur.

4.6.1.2 Applicant's Preferred Alternative (Route A)

For this project, although Route A lies within 91.4 m (300 ft) of a greater number of habitable structures (11), it is the shorter of the two alternatives (1,356.4 m, or 4,450 ft), parallels a greater amount (987.6 m, or 3,240 ft) of existing ROW (the Old Edinburg Canal), and does not cross any cultivated cropland.

4.6.1.3 Route B

Route B lies within 91.4 m (300 ft) of fewer habitable structures (4), but is the longer of the alternatives (1,905 m, or 6,250 ft), parallels less existing ROW (591.3 m, or 1,940 ft), and crosses approximately 554.7 m (1,820 ft) of cultivated cropland.

Neither of the alternative routes would affect any local, state, or federal land use plans. Both of the alternatives are located within the Mission City Limits; however, neither would conflict with future land use as defined in the Mission Comprehensive Plan. The study area lies in the southwestern portion of the master planned community of Sharyland Plantation. Any potential conflicts between the proposed project and the master plan for Sharyland Plantation would be resolved between the developer and the utility.

4.6.2 Aesthetics

Aesthetic impacts, or impacts on visual resources, exist when the ROW, lines and/or structures of a transmission line system, create an intrusion into, or substantially alter the character of the existing view. The significance of the impact is directly related to the quality of the view, in the case of natural scenic areas, or to the importance of the existing setting in the use and/or enjoyment of an area, in the case of valued community resources and recreational areas.

Construction of the proposed 138-kV transmission line could have both temporary and permanent aesthetic effects. Temporary impacts would include views of the actual assembly and erection of the

structures and clearing of the ROW. Where wooded areas are cleared, the brush and wood debris could have a temporary negative impact on the local visual environment. Permanent impacts from the project would involve the views of the structures and lines as well as views of cleared ROW.

As stated in Section 3.8.2, the study area exhibits a generally low to moderate level of aesthetic quality in an area that presents an intensive level of landscape modification due to agricultural, commercial, and residential development. However, both routes A and B would be visible from FM 1016, which comprises a portion of TxDOT's "Tropical Trail." Additionally, La Lomita Historical Park (which includes La Lomita Chapel), a designated attraction along the Tropical Trail, and St. Peter's Novitiate (within the La Lomita Historic District), are both located in close proximity to the proposed routes (potential visual impacts to these areas are discussed in more detail in Section 4.7 of this document). Other recreational areas that are located within close proximity to the routes include Time Out Campgrounds, the LRGV NWR, and Chimney Park.

4.6.2.1 No Action Alternative

The aesthetics of the study area under this alternative could arguably be affected by any type of development in the area. Aesthetic impacts from the proposed project would not occur.

4.6.2.2 Applicant's Preferred Alternative (Route A)

Route A would be less visible from recreational areas when compared to Route B. Approximately 2,350 ft of Route A would fall within the foreground visual zone (0.8 km, or 0.5 mile) of the Time Out Campground, and an additional 685.8 m (2,250 ft) would be visible from Chimney Park. No portion of Route A would be within the foreground zone of La Lomita Historical Park or the LRGV NWR. Approximately 914.4 m (3,000 ft) of Route A would be within the foreground zone of the Tropical Trail (FM 1016). Potential visual impacts to the La Lomita Historic District are discussed in Section 4.7.2 of this report.

4.6.2.3 Route B

Route B is located approximately 76.2 m (250 ft) north of La Lomita Historical Park, and therefore approximately 1,371.6 m (4,500 ft) of this alternative would be within the foreground visual zone of the park. Additionally, Route B would also fall within the foreground visual zone of Time Out Campgrounds (1,371.6 m, or 4,500 ft) and the LRGV NWR (approximately 1,082 m, or 3,550 ft). Approximately 1,219.2 m (4,000 ft) of Route B would be within the foreground zone of the Tropical Trail (FM 1016). Potential visual impacts to the La Lomita Historic District are discussed in Section 4.7.2 of this report.

4.6.3 Recreation

4.6.3.1 No Action Alternative

Potential effects on recreation in the study area as a result of the proposed project would not occur.

4.6.3.2 Applicant's Preferred Alternative (Route A)

Route A would not cross or directly impact any existing public or private park or recreation area. This alternative, however, is located within 304.8 m (1,000 ft) of the Time Out Campgrounds and the Chimney Park RV Resort. Because Route A is not located within any portion of these park boundaries, there would be no interference with any potential recreational activities.

Additionally, the TPWD considers the Rio Grande to be a permanently floatable waterway within the study area as well as a regional attraction. However, recreational use of the Rio Grande is limited by the lack of public access points or other recreation facilities. The proposed transmission line would span the entire surface area of the river and not likely interfere with any river-related recreational activities.

4.6.3.3 Route B

Route B would also not cross or directly impact any existing public or private park or recreation area. However, Route B would pass within 304.8 m (1,000 ft) of the Time Out Campgrounds, the La Lomita Historical Park, and a tract of the LRGV NWR. However, because this alternative is not located within any portion of park boundaries, there would be no interference with any potential recreational activities.

Additionally, the TPWD considers the Rio Grande to be a permanently floatable waterway within the study area as well as a regional attraction. However, recreational use of the Rio Grande is limited by the lack of public access points or other recreation facilities. The proposed transmission line would span the entire surface area of the river and not likely interfere with any river-related recreational activities.

4.6.4 Aviation/Transportation

4.6.4.1 No Action Alternative

Any potential effects on aviation/transportation in the study area as a result of the proposed project would not occur.

4.6.4.2 Applicant's Preferred Alternative (Route A)

The proposed transmission line facilities would have only a minimal effect on aviation operations within the study area. Structure heights would average approximately 26 m (85 ft), depending upon structure design and location. According to Federal Aviation Regulations (FAR), Part 77, notification of the

construction of the proposed transmission line would be required if structure heights exceed the height of an imaginary surface extending outward and upward at a slope of 100 to 1 for a horizontal distance of 6,096 m (20,000 ft) from the nearest point of the nearest runway of a public or military airport having at least one runway longer than 975.4 m (3,200 ft). If a runway is less than 975.4 m (3,200 ft), notification is required if structure heights exceed the height of an imaginary surface extending outward and upward at a slope of 50 to 1, for a distance of 3,048 m (10,000 ft). There are no public, private, or military airfields within 6,096 m (20,000 ft) of Route A and, therefore, FAA notification would not be required for the applicant's preferred alternative.

The use of aircraft in support of farming activities is widespread throughout the Lower Rio Grande Valley, including portions of the study area. Airplanes are used for fertilizing and the application of pesticides and herbicides. The necessities of agricultural aviation generally require aircraft to operate at very low altitudes and thus, the location of transmission lines could potentially impact these operations. Route A crosses no farmland and thus, should pose no direct problem to these operations. The route is adjacent to several agricultural fields, however, so there could be some concerns. Hunt Development, developers of Sharyland, owns all of the tracts currently used for cropland and has plans to develop each into non-agricultural uses, thus eventually eliminating potential conflict.

Potential impacts to transportation could include disruption of traffic and conflicts with proposed roadway and/or utility improvements, and may include increased traffic during construction of the proposed project. The project would generate only minor construction traffic. This traffic would consist of construction employee's personal vehicles, truck traffic for material deliveries, and concrete trucks for structure foundation work. At the peak of construction, it is estimated the project would generate no more than 40 vehicles per day (compared to ADTs of 5,000–8,000 on study area roads). These impacts are usually temporary and short-term. Because Route A crosses FM 1016, Sharyland would be required to obtain a road-crossing permit from TxDOT.

The proposed transmission line would have a minimal effect on communication operations in the area. No AM/FM radio transmitters were identified within the study area. Additionally, no electronic communications towers are located within 609.6 m (2,000 ft) of the applicant's preferred alternative.

4.6.4.3 Route B

The proposed transmission line facilities along Route B would also have only a minimal effect on aviation operations within the study area (see discussion in Section 4.6.4.2 above). There are no public, private, or military airfields within 6,096 m (20,000 ft) of Route B and, therefore, FAA notification would not be required for this route.

Route B crosses two small, isolated agricultural fields, so there could potentially be some conflicts with aerial spraying. However, these activities have coexisted with numerous and increasing numbers of both distribution and transmission lines for decades throughout the valley. In addition, Hunt Development,

developers of Sharyland, owns both tracts and plans to develop each into non-agricultural uses, thus eventually eliminating potential conflict.

Potential impacts to transportation could include disruption of traffic and conflicts with proposed roadway and/or utility improvements, and may include increased traffic during construction of the proposed project. The project would likely generate only minor construction traffic. This traffic would consist of construction employee's personal vehicles, truck traffic for material deliveries, and concrete trucks for structure foundation work. At the peak of construction, it is estimated the project would generate no more than 40 vehicles per day (compared to ADTs of 5,000–8,000 on study area roads). These impacts are usually temporary and short-term. Because Route B crosses FM 1016 and FM 494, Sharyland will be required to obtain road-crossing permits from TxDOT for this alternative.

The proposed transmission line would have a minimal effect on communication operations in the area. No AM/FM radio transmitters were identified within the study area. Additionally, no electronic communications towers are located within 609.6 m (2,000 ft) of Route B.

4.7 IMPACTS ON CULTURAL RESOURCES

This project's requirement of a Presidential Permit and regulatory review by the DOE triggers cultural resource management requirements under NEPA and the NHPA. Both of these laws require that the lead federal agency, the DOE, consider potential impacts to significant cultural resources before the project is approved for construction. Specific cultural resource management requirements are defined under Section 106 of the NHPA, as amended.

Section 106 requires that a good-faith effort be conducted to identify all significant historic (meaning National Register eligible) cultural properties within the project's area of potential effect. Archaeologically, the area of potential effect is usually limited to the ROW within which construction-related activities occur. This is the area within which direct effects may occur to resources located within the ROW. However, Section 106 further requires that possible indirect effects be considered for historical resources in close proximity to the proposed alternative routes. In this sense, the area of potential effect for non-archaeological resources includes the area within a variable visual range surrounding a transmission line project. This type of indirect effect can become adverse when the historical value of an affected resource depends on the visual historical integrity of its setting or visible surroundings. Other types of indirect affects (e.g. noise, vibration, or air quality) are not typically a matter of concern for transmission line projects. Analysis of the direct and indirect effects of the project upon identified cultural resources is presented as follows.

4.7.1 Archaeological Impact Assessment

During the alternatives analysis for this project, archaeological survey data was lacking for the study area. To address this deficiency, a preliminary assessment of archaeological resource potential was developed

for each alternative by identifying archaeological HPA along the ROW of each proposed route. This method took into account topographic setting, environment, availability of raw materials, water, and subsistence resources, as well as historical maps for each route. Most of the study area occurs within an expansive alluvial floodplain, the type of setting that favors deposition and burial of intact archaeological sites and thus qualifies as a HPA. The routes were compared and the amount of HPA was used in selection of a preferred alternative. Summary assessments for each of the alternative routes is presented below.

4.7.1.1 No Action Alternative

Under the No Action Alternative, cultural resources will not be directly affected by construction but such resources would be subject to continued developmental alterations occurring across the study area.

4.7.1.2 Applicant's Preferred Alternative (Route A)

No cultural resource sites are currently recorded within the ROW of Route A, nor are any recorded within 304.8 m (1,000 ft) of the ROW. However, the entire length of Route A, 1,356 m (4,448 ft), is considered a HPA for unrecorded archaeological resources. The area within the Rio Grande's natural floodplain is a likely location for deeply buried archaeological sites. The area away from the floodplain has a high probability for containing surficial or shallowly buried archaeological sites. Consequently, the entire length of Route A presents a high likelihood for impacts to archaeological resource sites. Archaeologists would monitor construction in the area near the Rio Grande, especially the excavation for structures. If previously undiscovered cultural resources are found elsewhere on the project, work at that location would be temporarily suspended and the SHPO consulted before proceeding. To avoid impacting shallowly buried sites along the ROW, traffic would be restricted to only those vehicles necessary for construction. Off-site parking areas would be designated for construction worker's vehicles.

4.7.1.3 Route B

No cultural resource sites are currently recorded within the ROW of Route B, nor are any recorded within 304.8 m (1,000 feet) of the ROW. The entire length of Route B, 1,904 m (6,245 ft), is also considered to have a high probability for the presence of unrecorded archaeological sites. Again, like Route A, the area within the Rio Grande's natural floodplain has the potential to contain deeply buried sites, while the area outside of the floodplain is likely to contain surficial or shallowly buried sites. Therefore, Route B is also considered to have a high potential for impacts to unrecorded cultural resource sites, but to a greater extent, as a result of its greater length of HPA.

4.7.2 Historical/Non-Archaeological Resource Impacts

The area of potential effect for non-archaeological historic resources includes the area within a variable visual range surrounding the proposed transmission line project. Because significant historical resources

have been identified within and near the study area through previous resource identification and assessment efforts, the known resources were examined by a historian with specialized expertise in assessing effects in accordance with Section 106 and Secretary of the Interior standards. Attention was paid to the overall visual historic integrity of the study area as well as visible non-historic alterations or intrusions within the view shed surrounding the known historic resources. Other types of indirect affects (e.g. noise, vibration, or air quality) were not given as much consideration because such effects are not usually caused by transmission line projects. Analysis of the project's effects upon known non-archaeological historic resources is presented as follows.

4.7.2.1 No Action Alternative

Under the No Action Alternative, no historic resources would be visually affected, but impacts to such resources would continue to occur as a result of the ongoing patterns of general development in the area.

4.7.2.2 Applicant's Preferred Alternative (Route A)

Adverse visual impacts to historic resources are unlikely to occur in connection with Route A because rapid development in and around this route has already changed the historical setting that existed across the area 50 or more years ago. While the nearby community of Madero may contain historic buildings never before assessed for historical significance, the altered visual setting surrounding the community's buildings would not likely be a favorable factor in any future determinations of National Register eligibility. The immediate setting of the Old Edinburg Canal irrigation canal that occurs within the study area would be highly affected by the preferred alternative. However, the individual historical significance of this segment of canal is limited, and the resource type is better represented by the 43,000-ac system listed in the National Register as the Louisiana-Rio Grande Canal Company, currently operated by Hidalgo County Water District No. 2, which would be unaffected by the project.

The most well known historic resource in the APE is the La Lomita Historic District. Its nearest boundary is located approximately 490 m (1,607 ft) from Route A, but its original rural agricultural setting has been affected by changes in land use and other visible alterations to the surrounding landscape. Within the viewshed of La Lomita, a small railway crossed by Route A was once part of the "Spiderweb Railway." Its tracks and signs have been replaced, thereby limiting its individual historical integrity and the setting around it.

Route B

Indirect visual impacts to significant cultural resources are more likely to occur for Route B than Route A because this route is much closer to the La Lomita Historic District. Route B is located less than 33 m (108 ft) from the nearest district boundary, thus it would be highly visible from the district and its significant historic buildings. Such an impact is probably non-adverse because rapid, ongoing development in and around this route has already changed to a great extent the mission's historical setting

that existed 50 or more years ago. Recent development has similarly altered the physical integrity and historical setting of the “Spiderweb Railway,” and the early 20th century irrigation canals that occur within the study area

4.7.3 Summary of Cultural Resources Impacts Analysis

In the absence of complete archaeological survey information for the study area, the survey area’s potential for impacts to archaeological resources was first assessed by analysis of archaeological HPAs. Topographic setting, environment, the availability of raw material, water, and subsistence resources, as well as historical maps, were all taken into consideration in the HPA assessments. The two build alternatives, Route A and Route B, were then compared in terms of their length of HPA. Route A is 1,356 m (4,448 ft) long and the entire route was considered HPA. Route B is 1,904 m (6,245 ft) long and the entirety of this route also was considered HPA. For both routes, the area within the Rio Grande’s natural floodplain has the potential to contain deeply buried sites, while the area outside of the floodplain would likely contain surficial or shallowly buried sites.

A simple comparison of the archaeological site potential for these two alternatives favors Route A. This route contains substantially less HPA than Route B. In addition, a cultural resources survey of the applicant’s preferred route, Route A, was performed on October 20, 2003. Given the negative results of shovel testing along the proposed ROW, and the degree of landscape modification, it is unlikely that shallow prehistoric deposits remain intact within the ROW, further reducing the area of concern for archaeological impacts along this route. Rather than conduct deep mechanical survey at all impact locations in the deep floodplain soils along the river, which would cause more extensive impacts to deeply buried sites, if any are present, archaeological monitoring of proposed pole locations 1, 2, and 3 was recommended. SHPO concurred with this recommendation. The complete results of this survey are presented in a report contained in Appendix B of this document.

As noted in Section 3.9.2 of this document, a review of official listings of recorded historic properties within Hidalgo County identified one National Register-listed property, La Lomita Historic District, in the study area. A brief visit to the district was conducted by an architectural historian to verify the existing condition of the district and its surroundings. Despite a variety of modern alterations to the setting in and around the district, both of the church buildings retain a high degree of individual integrity and, therefore, continue to maintain their architectural and historical importance to the local area. However, alterations to the original rural agricultural environment diminish the historical integrity of the setting beyond the district boundaries. Ongoing patterns of residential, commercial, and industrial redevelopment across the study area since the mid-twentieth century have further diminished the integrity of other historic age resources in the area, such as the Madero Community, the Spiderweb Railroad, and the Old Edinburg Canal. The balance of cultural resource factors considered favors selection and construction of the Applicant’s Preferred Alternative, Route A, with the understanding that archaeological

monitoring would be conducted at proposed pole locations 1, 2 and 3 along the river terrace portion of the route.

4.7.4 Mitigation (All Alternative Routes)

Mitigation is required when a significant (National Register listed or eligible) historic resource is adversely affected by a project. The preferred method is avoidance through careful route selection or redesign. In this sense, the route selection process provided a level of analysis and consideration that mitigated possible effects to cultural resources in the study area. Alternative forms of mitigation could include detailed historical documentation for historical sites, data retrieval for archaeological sites, relocation of historic buildings, or planting of visual screening elements, depending on the type and extent of the impact upon the resource. In terms of historic resources, Route A, the Applicant's Preferred Alternative, presents less impact to the La Lomita Historic District because its visibility will be less than of Route B. However, neither Route A or Route B are likely to cause adverse effects to significant historic resources as defined under Section 106 of the NHPA. Consequently, formal agreements to define mitigative procedures and treatments are not necessary for either alternative route. However, in terms of archaeological resources, a preemptive mitigative requirement has been recommended and approved by SHPO. During construction, archaeological monitoring would be conducted at Pole Locations 1, 2, and 3, as indicated in Appendix B, to minimize disturbance and record evidence of deeply buried archaeological resources, if any exist, in the floodplain spoils near the river.

4.8 ELECTRIC AND MAGNETIC FIELDS

Sharyland's proposed transmission line would be a single-circuit, 138-kV line constructed on wood, concrete, or steel single-pole structures within a 30.5-m (100-ft) wide ROW. The line would be designed to carry a sustained load of 300 MVA (300,000 kVA).

Any device which transmits, distributes, or uses electric power produces electric and magnetic fields (EMFs). As discussed below, extensive research has not revealed any conclusive evidence that magnetic fields from powerlines pose a hazard to animal or human health.

The electric field from a transmission or distribution line is a function of the voltage of the line. Because the voltage of a line is essentially constant over time, the magnitude of the electric field remains constant regardless of the amount of the load on the line. Electric fields are grounded by large objects such as trees and buildings.

The level of the magnetic field produced by an electric transmission line depends on the electrical load, the configuration of the conductors (spacing and orientation), the height of the conductors, the distance from the line, the electrical load on the line, and the proximity of other electrical lines. The load on a transmission line varies continually on a daily and seasonal basis. The magnetic fields likewise vary throughout the year and during the day.

Extensive research has been conducted to determine whether electric or magnetic fields may cause or promote adverse health effects. This research continues, including studies funded by the United States Government. In recent years, the main emphasis has been on magnetic fields. Electrical fields were studied in previous years, and were not found to be a concern for levels typical of powerlines. Independent reviews of the literature on potential health effects are consistent; research has not revealed any conclusive evidence that magnetic fields from powerlines pose a hazard to animal or human health.

One of these studies is the report by the National Research Council (National Research Council, 1997). The National Research Council consists of members of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. The committee reached the following conclusion regarding the potential health effects of EMFs:

“Based on a comprehensive evaluation of published studies relating to the effects of power-frequency electric and magnetic fields on cells, tissues, and organisms (including humans), the conclusion of the committee is that the current body of evidence does not show that exposure to these fields presents a human-health hazard. Specifically, no conclusive and consistent evidence shows that exposures to residential electric and magnetic fields produce cancer, adverse neurobehavioral effects, or reproductive and developmental effects.”

This conclusion is consistent with other reviews of the scientific literature, including ones by the Oak Ridge Associated Universities (1992), the American Medical Association (Council on Scientific Affairs, 1994), the American Physical Society (Hafemeister, 1995), and the American Cancer Society (Heath, 1996). These conclusions are also consistent with the findings of a previous study prepared for the Public Utility Commission of Texas entitled, *Health Effects of Exposure to Powerline-Frequency Electric and Magnetic Fields*. That study stated that “. . . the evidence at this time is insufficient to conclude that exposure to EMF from electric power transmission lines poses an imminent or major public health risk.” (PUC, 1992).

Other studies completed since the mid-1990s have not shown a strong correlation between electric and/or magnetic fields and the future development of cancers. A voluminous amount of data is available in printed and electronic formats concerning epidemiologic studies undertaken to address this subject. Two sources of information that are fairly detailed, yet easy to navigate, are websites for the World Health Organization’s “International EMF Project” (www.who.int/peh-emf/en/), and the Medical College of Wisconsin’s “Electromagnetic Fields and Human Health” (www.mcw.edu/gcrc/cop/powerlines-cancer-FAQ/toc.html).

The proposed transmission line would generate EMFs. Additional measures would be implemented to ensure that the field strengths are minimized outside of the transmission line ROW. Notably, conductors would be designed to be in a “delta-shaped” configuration, and the minimum conductor height above ground would be approximately 8.5 m (28 ft), with a ROW width of approximately 30.5 m (100 ft). The

“delta-shaped” configuration has been recommended, as it ensures that the mutual magnetic fields are minimized within the structure itself, thereby reducing external magnetic fields. The minimum conductor height of 8.5 m (28 ft) is greater than the minimum allowed by existing electric codes to increase the distance from field generating conductors and nearby structures. The ROW width of 30.5 m (100 ft) would maintain a minimum distance of 12.2 m (40 ft) from field generating conductors to structures which might be constructed at the edge of the ROW in the future. These factors have been comparatively evaluated to minimize EMFs at the edge of the ROW while being economically justifiable. The maximum EMFs have been calculated to be 1.17 kilovolts per meter (kV/m) and 26.3 milligauss (mG) at the edge of the ROW, respectively.

Project economics would also be re-evaluated when final design parameters are established to confirm the most economical minimum height of conductors and ROW width are utilized to minimize the field strengths at the edge of the ROW. Where possible, minimum design conductor height and ROW width would be increased.

The effect of powerline EMF upon living organisms continues to be studied worldwide and advances in techniques to minimize impacts of EMF are expected to result from these studies. Any information concerning the mitigation of EMF that becomes available prior to the construction of the proposed project would be incorporated into the final routing and design.

Efforts to reduce corona discharge (e.g., ensuring tight, unscratched hardware) should result in no noticeable ozone production and, thus, no effects are expected. Radio and television interference may also result from corona discharges. The level of AM radio and television interference depends upon a number of factors including voltage, conductor diameter, number of conductors per phase, phase spacing, conductor height, conductor surface factor, relative air density (humidity), and wind speed. Of greatest importance are conductor diameter and configuration and conductor surface factor. Hardware would be designed to reduce radio noise. Excessive AM radio interference is uncommon from 138-kV lines. However, should radio interference become a problem due to equipment defects, such defects would be addressed. Television interference (in the low VHF bands) may occur, especially if the signal is weak and the antenna is directional and too close to the transmission line. Complaints would be checked and problems corrected if determined to be caused by the transmission line.

Any noticeable voltage induced in fences, gates, and other metal objects beneath the line is not anticipated. None of the agricultural lands crossed by the alternative transmission line routes were observed to use either fixed or portable irrigation systems. Voltages induced in conducting bodies adjacent to transmission lines are proportional to line voltage, distance, and conductor length.

4.9 TRANSBOUNDARY IMPACTS

In July 1997, the Council on Environmental Quality (CEQ) issued a guidance pertaining to NEPA requirements for analysis and disclosure of transboundary impacts (impacts across an international

border) of proposed federal actions taking place in the U.S. This guidance determined that federal agencies must include a description of reasonably foreseeable transboundary effects of proposed actions in the U.S. in their analysis.

CFE has prepared a document that describes the project on the Mexican side of the border and includes information on the prevention of environmental impacts related to the proposed project. This document will be provided to the DOE to assist in their compliance with the CEQ requirements.

4.10 MITIGATION

The proposed Sharyland Mexico Tie Project would be constructed as a single-circuit, 138-kV line, on wood, concrete, or steel single-pole structures.

The following is a summary of measures that Sharyland proposes to undertake to mitigate the effects of the construction and operation of the proposed transmission line:

- Efforts would be made during construction for proper control and handling of any petroleum or other chemical products used.
- Appropriate erosion-control measures would be utilized during construction of the transmission line and converter station.
- Sharyland does not propose to use herbicides for ROW maintenance. However, should woody species become a problem within the ROW and herbicide use is required, Sharyland would use only EPA-approved herbicides, and application would be made according to label directions.
- With the permission of the landowner, cleared or trimmed woody vegetation may be stacked outside the ROW to enhance habitat for some wildlife species.
- Construction within the ROW would be performed in such a manner as to minimize adverse impacts to vegetation adjacent to the ROW.
- All work in agricultural fields would be conducted in dry weather with rubber-tired vehicles.
- Sharyland has taken into account archaeological and historical resources in the selection and evaluation of alternative routes. If cultural resources consultation is required during any future permitting activities for this project, Sharyland would coordinate with the SHPO. If any cultural resource sites are discovered during construction, they would be reported to the SHPO.
- The transmission line would be designed to reduce audible noise, ozone production, and radio/television interference.

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- The clean-up operation would involve the removal of debris and the restoration of items damaged by the construction of the project as required. Sharyland would assure that affected areas are restored as close to the original condition as practical. All unavoidable damage claims would be resolved by Sharyland's ROW contractor.
 - Archaeological monitoring of construction would be conducted in areas of high archaeological potential at poles 1, 2, and 3, to record any cultural materials displaced from deeply buried contexts. If human skeletal remains are encountered, construction in the vicinity would be stopped and the SHPO contacted for further direction.

Table 4-1 provides a summary of impacts for each resource category (e.g., vegetation, wildlife, etc.) that would result from the three alternatives (No Action, Proposed Action, and Alternate Action).

TABLE 4-1
SUMMARY OF ALTERNATIVES IMPACTS

Resource Category	No-Action Alternative	Proposed Action (Route A)	Alternate Action (Route B)
Geology/Soils	No impacts would result from the project. Changes to the soil would be limited to biological processes and changes in land use practices. Soil productivity would be affected naturally through leaching and weathering, but the effects would be negligible.	Construction-related erosion and compaction could occur but only very small areas (37.4 sq m or 402.4 sq ft) immediately beneath the structures would be unavailable for use. No prime farmland soils would be removed from crop production. The area of soil to be removed from potential production would be restricted to the area physically occupied by the structures plus any additional area removed from production as a result of limited access by farm equipment around the base of structures. The 2.8-ha (7-ac) converter station site would be permanently removed from crop production.	The general impacts would be similar to Route A except that Route B is longer and crosses approximately 1,691.6 m (5,550 ft) of prime farmland soils (including 563.9 m (1,850 ft) of land currently used as cropland). Impacts resulting from soil compaction, erosion, and loss of productivity would be greater than those from Route A, the bases of the structures taking up approximately 46.7 sq m, or 503 sq ft.
Water	No impacts would result from the project. Changes would be limited to biological and natural processes. Sedimentation as a result of soil disturbance through agricultural practices and natural erosion would continue. Effects would be negligible.	Route A would have less potential impact from pollution resulting from erosion or the accidental spillage of petroleum or other chemicals, than Route B. Route A would cross the lesser amount of 100-year floodplain (approximately 198.1 m, or 650 ft) and, therefore, would have less potential impact. It also crosses less open water (river and canal), approximately 94.5 m (310 ft).	Route B is approximately 1.3 times longer than Route A and thus would have more potential for impacts. It would cross more 100-year floodplain and open water (river and canal), approximately 457.2 m (1,500 ft) of 100-year floodplain and 155.5 m (510 ft) of open water.
Vegetation	No impacts would result from the project. Species composition would continue to change slowly as a result of natural succession and from natural occurrences. Species composition would change more rapidly through agricultural practices and urban/suburban development.	Route A would require little clearing of vegetation (crossing no brushland/woodland). The Rio Grande would be spanned without placing structures in the jurisdictional area, thus minimizing potential impacts.	Route B would require more vegetation clearing than Route A (crossing approximately 73.2 m (240 ft) of brushland/ woodland). Potential impacts to the Rio Grande would be similar to that of Route A.

TABLE 4-1 (CONT'D)

Resource Category	No-Action Alternative	Proposed Action (Route A)	Alternate Action (Route B)
Wildlife	No impact would result from the project. Impacts would be limited to biological changes and changes resulting from continued agricultural and other land use practices. Any brush clearing that took place as a result of these activities would reduce habitat for certain species. Effects would be negligible.	Route A traverses no brushland, woodland, or riparian habitats. Route A crosses approximately 94.5 m (310 ft) of open water; however, these areas would be spanned. Route A represents less potential impact for avian mortality through wire strikes than Route B because it is the shorter route (1,356.4 m or 4,450 ft). No impacts to endangered species are expected.	Route B crosses approximately 73.2 m (240 ft) of brushland/woodland and 155.5 m (510 ft) of open water. Route B, being approximately 1,905 m (6,250 ft) in length, has a greater potential than Route A for avian wirestrikes. No impacts to endangered species are expected.
Aquatic Ecosystems	No impacts would result from the project. Changes would be limited to biological and natural processes. Sedimentation as a result of soil disturbance through agricultural practices, including vegetation removal in riparian areas, would continue. Effects would be negligible.	No potential wetlands would be crossed. Route A would cross approximately 94.5 m (310 ft) of open water (river and canal); however, these areas would all be spanned.	No potential wetlands would be crossed. Route B would cross approximately 155.5 m (510 ft) of open water (river and canal); however, these areas would all be spanned. Route B has a greater potential than Route A for sedimentation resulting from soil disturbance because it is the longer route.
Socioeconomics	If the proposed project is not constructed, benefits to both the U.S. and Mexican electrical systems, including improved service reliability and the development of markets to trade power across the border, would not occur at this location.	Benefits to both the U.S. and Mexican electrical systems, including improved service reliability and the development of markets to trade power across the border, would occur at this location.	Benefits to both the U.S. and Mexican electrical systems, including improved service reliability and the development of markets to trade power across the border, would occur at this location.
Land Use	No impacts would result from the project. Current land use practices would continue.	Although Route A lies within 91.4 m (300 ft) of a greater number of habitable structures (11), it is the shorter of the two alternatives (1,356.4 m, or 4,450 ft), parallels a greater amount (987.6 m, or 3,240 ft) of existing ROW (the Old Edinburg Canal), and does not cross any cultivated cropland.	Route B lies within 91.4 m (300 ft) of fewer habitable structures (4), but is the longer of the alternatives (1,905 m, or 6,250 ft), parallels less existing ROW (591.3 m, or 1,940 ft), and crosses approximately 554.7 m (1,820 ft) of cultivated cropland.

TABLE 4-1 (CONT'D)

Resource Category	No-Action Alternative	Proposed Action (Route A)	Alternate Action (Route B)
Aesthetics	No impacts would result from the project.	Route A would be less visible from recreational areas than Route B. Approximately 2,350 ft of Route A would fall within the foreground visual zone (0.8 km, or 0.5 mile) of the Time Out Campground, and an additional 685.8 m (2,250 ft) would be visible from Chimney Park. No portion of Route A would be within the foreground visual zone of La Lomita Historical Park or the LRGV NWR. Approximately 914.4 m (3,000 ft) of Route A would be within the foreground zone of the Tropical Trail (FM 1016).	Approximately 1,371.6 m (4,500 ft) of this alternative would be within the foreground visual zone of La Lomita Historical Park. Route B would also fall within the foreground visual zone of Time Out Campgrounds (1,371.6 m, or 4,500 ft) and the LRGV NWR (approximately 1,082 m, or 3,550 ft). Approximately 1,219.2 m (4,000 ft) of Route B would be within the foreground visual zone of the Tropical Trail (FM 1016).
Recreation	No impacts would result from the project.	Route A would not cross or directly impact any existing public or private park or recreation area, but is located within 304.8 m (1,000 ft) of the Time Out Campgrounds and the Chimney Park RV Resort. There would be no interference, however, with any potential recreational activities. The proposed transmission line would span the Rio Grande and would not interfere with any river-related recreational activities.	Potential impacts to recreation from this alternative would be similar to those of Route A.
Aviation/Transportation	No impacts would result from the project.	Potential impacts to aviation from this alternative are expected to be less than those from Route B because it crosses no cropland. This Route is located adjacent to several agricultural fields; however, so there is some potential for conflicts with aerial spraying. Potential impacts to transportation could include disruption of traffic and conflicts with proposed roadway and/or utility improvements. Increased traffic may occur during construction; however, this would be minor and short-term.	Route B crosses two small, agricultural fields, so there is the potential for conflicts with aerial spraying. Generally, transportation impacts from this alternative are similar to those of Route A. Route B crosses FM 1016 and FM 494, requiring Sharyland to obtain road-crossing permits from TxDOT.

TABLE 4-1 (CONT'D)

Resource Category	No-Action Alternative	Proposed Action (Route A)	Alternate Action (Route B)
Cultural Resources	No impacts would result from the project.	Although the entire length of Route A; 1,356 m (4,448 ft), is considered a HPA for unrecorded archaeological resources, a pedestrian cultural resources survey found no sites and the SHPO concurred with the survey results. The area within the Rio Grande's natural floodplain is a likely location for deeply buried archaeological sites and so an archaeologist will monitor construction in the Rio Grande floodplain and if cultural resources are discovered, the SHPO will be consulted.	The entire length of Route B, 1,904 m (6,245 ft), is considered to have a high probability for the presence of unrecorded archaeological sites. The area within the Rio Grande's natural floodplain has the potential to contain deeply buried sites, while the area outside of the floodplain is likely to contain surficial or shallowly buried sites. Route B is considered to have a greater potential for impacts to unrecorded cultural resource sites than Route A because of its greater length of HPA.
Historic Resources	No impacts would result from the project.	Adverse visual impacts to historic resources are unlikely to occur in connection with Route A because rapid development in and around this route has already changed the historical setting that existed across the area 50 or more years ago.	Indirect visual impacts to significant cultural resources are more likely to occur for Route B than Route A because this route is much closer to the La Lomita Historic District and Park (33 m (108 ft)) from the nearest district boundary, making it highly visible from the significant historic buildings of that District. These potential impacts; however, are not likely to be significant because of the extent of development that is proposed and development that has already occurred in the vicinity of this route.

5.0 CUMULATIVE IMPACTS

According to the U.S. Census Bureau, the McAllen-Edinburg-Mission MSA was the fourth fastest-growing area in the nation during the 1990s. Despite a national recession and relatively slow growth nationwide, the MSA has continued to show positive growth. The location of the study area within Sharyland Plantation, a 2,428.1-ha (6,000-ac) master-planned development, assures future growth and development would occur in the area. Construction is also planned to begin on the Anzalduas International Bridge and Port of Entry on the eastern edge of the study area. This new international crossing should accelerate NAFTA-related trade and commerce in the region, connecting the Mission and McAllen free-trade areas with Reynosa, and the rest of northern Mexico.

This projected growth and development, combined with the potential impacts from the Sharyland-Mexico 138-kV DC Tie Project could, cumulatively, affect the natural and human environment of the study area. These impacts could potentially include increased air emissions, increased water demand, increased surface water runoff, the conversion of farmland to urban and suburban development, and the possible loss of some native vegetation and wildlife habitat. The latter impact would be somewhat mitigated by the acquisition of lands for wildlife habitat by the TPWD, FWS, and private conservation groups. Other specific, future related impacts and/or developments in the immediate vicinity of the proposed transmission line are unknown by PBS&J at this time.

Sharyland's previously approved (by the PUC) 138-kV transmission line and substation project is currently under way, and should be completed by August 2004. The poles, conductor, and hardware for this project are currently on-site and the construction contract was awarded on or about May 10, 2004. It is anticipated that this project would employ two 4-man crews, one contract Crew Foreman, an Owner/Engineer Inspector, and one Project Manager, for the duration of the construction. The proposed Railroad Substation would be built on 1.6 ha (4 ac) of land adjacent to the transmission line. However, construction of this project would not overlap construction of the HVDC Interconnection Project.

While Sharyland would irreversibly expend labor, materials, fuel, etc., in the construction and operation of the proposed DC tie transmission line, no other known irreversible or irretrievable commitments of natural resources would occur. As the purpose of the proposed transmission line is to help meet rising energy demands along the U.S.-Mexico border, it would not create any major new energy demand. In addition, no new, unusual, or limited sources or types of materials are proposed for use in this project.

6.0 AGENCIES AND PERSONS CONSULTED

The following federal, state, and local agencies/offices were contacted by letter in May 2003 to solicit comments, concerns, and additional information pertaining to permits or approvals regarding the construction of a transmission line within the study area. A map of the study area was included with each letter. A list of agencies/officials who were contacted, a sample letter, and study area map are included in Appendix A.

- Texas Department of Transportation (TxDOT), Division of Aviation
- Texas Department of Transportation (TxDOT), Division of Environmental Affairs
- Texas Historical Commission (THC)
- Texas Parks and Wildlife Department (TPWD)
- Texas Biological and Conservation Data System (TXBCD)
- Texas Water Development Board (TWDB)
- Federal Aviation Administration (FAA)
- Federal Emergency Management Agency (FEMA)
- U.S. International Boundary and Water Commission (IBWC)
- National Park Service (NPS)
- Natural Resources Conservation Service (NRCS)
- U.S. Army Corps of Engineers (USACE), Galveston District
- U.S. Environmental Protection Agency (EPA), Region 6
- U.S. Fish and Wildlife Service (FWS), Ecological Services Field Office
- U.S. Fish and Wildlife Service (FWS), Lower Rio Grande Valley NWR
- City of Mission Planning Department
- Hidalgo County Judge
- Hidalgo County Commissioners (precincts 2 and 3)
- Lower Rio Grande Valley Development Council
- City of Mission Officials
- Mission Economic Development Association
- City of McAllen Officials
- McAllen Economic Development Corporation
- Frontera Audubon Society
- Sierra Club, Lower Rio Grande Valley Chapter
- Friends of the Wildlife Corridor
- Nature Conservancy of Texas, South Texas Office

As of the date of this report, written responses have been received from the following agencies/offices. Copies of all responses received are included in Appendix A. The concerns noted in the following agency comments are addressed in the appropriate subsections of Section 4.0 of this document.

The FEMA requested that the local Floodplain Administrator be contacted regarding the proper permits if any work is within a Special Flood Hazard Area.

The FAA was unaware of any particular environmental concerns or other relative matters that would require FAA involvement. They did, however, enclose FAA Form 7460-1 (Notice of Proposed Construction or Alteration) for review in the event that the proposed transmission line meets the criteria established under FAR Part 77.

The TPWD noted that the most sensitive wildlife habitats within the study area are mature native brush areas, the Bentsen Rio Grande Valley State Park, and units of the LRGV NWR, and that alternative route analysis should include specific planning considerations to avoid these areas. They also noted that additional planning considerations should include following existing ROWs; spanning drainage crossings at the narrowest points; avoiding being adjacent to and paralleling drainages; avoiding complete vegetation removal within the ROW if possible; and routing the line through non-native grasslands or pastures or previously disturbed areas.

The IBWC stated that the information provided in the letter was not sufficient to determine what effects the project might have on their Lower Rio Grande Flood Control Project (LRGFCP) and whether environmental or international impacts might occur. They also provided information for consideration in the preparation of environmental documentation for the proposed project. The IBWC would be opposed to any structure placed within the levee containment area that would reduce the design flood capacity of the international LRGFCP in the project vicinity. They noted that a license from the IBWC would be required for crossing or encroaching upon the LRGFCP. The IBWC provided information on an existing agreement between the IBWC and the FWS regarding a vegetated wildlife travel corridor along the Rio Grande. They also provided information on the criteria for levee crossing.

The TxDOT, Division of Aviation, stated that the FAA should be contacted if either of the following criteria applies: 1) if any construction or alteration obstructs a slope of 0.3 m (1 ft) of vertical height for each 30.5 m (100 ft) of horizontal distance out to a total distance of 6,096 m (20,000 ft) from the nearest point on any runway at a public-use airport with at least one runway, existing or planned, more than 975.4 m (3,200 ft) in length; or 2) any construction or alteration of more than 61 m (200 ft) above the surface of the ground. TxDOT stated that three public-use airports occur in Hidalgo County: Edinburg International Airport in Edinburg; Mid Valley Airport in Weslaco; and McAllen International Airport in McAllen. They further stated that nine private-use airports occur in the area: Putz in Mission; Moore near McCook; Norman and White near Edinburg; Cannon near Edcouch; Old Reb near Mercedes; Progreso in Progreso; Skalitsky near LaVilla; and Bell near Raymondville.

The FWS provided a list of nine federally listed/federal candidate species that have been recorded from Hidalgo County. They noted the importance of brush for wildlife in general and the ocelot and jaguarundi in particular. Because birds are protected under the MBTA, FWS recommended that brush-clearing activities be conducted outside the general nesting period of March through August. They also recommended that the lines be designed and constructed to prevent the electrocution of raptors, using guidelines in the publication entitled "Suggested Practices for Powerlines: State of the Art in 1981." FWS stated that the USACE should be contacted if it appears that the proposed construction plans could impact wetlands. They provided a map of several tracts of the LRGV NWR in the vicinity of the project. Finally, FWS recommended that the least impact would be if the powerline went due south instead of east and then south.

The THC responded that because the area had a high potential for containing archaeological sites, that an archaeological survey be conducted. An archaeological survey was conducted by archeologists of the firm of PBS&J on 5-7 January 1999. The findings were presented to the SHPO and a clearance letter for the project was issued by the SHPO on 16 February 1999. This clearance letter is included as Appendix B.

The BIA, contacted by phone, stated that no federally recognized Indian tribes occur in this area of Texas.

The USACE stated that some of the alternative transmission line routes being evaluated lie in the 100-year floodplain and that impacts to the floodplain as a result of the project should be defined and a plan to mitigate for any negative impacts should be developed. They also stated that the Chief of the Evaluation Section should be contacted to determine whether Department of the Army permits are needed.

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Glossary

Asynchronous Interconnection

A non-synchronous transmission interconnection between two electric power systems. Usually interconnected by means of a DC Tie.

Converter Station

The main component of an HVDC Interconnection that connects two separate high voltage AC Systems via a DC link. The basic principle of operation of an HVDC system is based on the conversion of AC to DC and vice-versa by means of converter valves comprised of power thyristors. Along with the converter transformers, AC switchyard, AC filters, capacitor banks, smoothing reactors and DC filters these components create a DC Tie.

Direct Current (DC) Tie

The tie normally connects to independent systems with different and incompatible electrical parameters such as frequency, voltage level, or short circuit power levels by converting the power from AC to DC and back to AC.

Reliability Must Run (RMR) Unit

A Generation Resource unit operated under the terms of an annual agreement that would not otherwise be operated except that they are necessary to provide voltage support, stability or management of localized transmission constraints under first contingency criteria where market solutions do not exist.

Appendix A

Agency Correspondence



An employee-owned company

May 27, 2003

Mr. Allan Strand
Field Supervisor
U.S. Fish and Wildlife Service
Ecological Services Field Office
c/o Texas A&M Univ. at Corpus Christi
6300 Ocean Drive, Campus Box 338
Corpus Christi, Texas 78412-5599

PBS&J Job No. 441216.00

Dear Mr. Strand:

Sharyland Utilities, L.P. (Sharyland) is proposing to construct new electric transmission facilities in Hidalgo County, Texas. Specifically, Sharyland is planning to build a new 138-kilovolt (kV) DC tie transmission line between an AC/DC Converter Station and the Comision Federal de Electricidad (CFE) electrical system in the State of Tamaulipas, Republic of Mexico. The location of the study area is shown on the attached figure. The new line will be approximately 1 to 3 miles long, depending upon the route selected, and built on steel or concrete single-pole structures within a 100-ft wide right-of-way (ROW).

PBS&J is preparing an Environmental Assessment and Alternative Route Analysis for the project to support Sharyland's applications for a Certificate of Convenience and Necessity (CCN) from the Public Utility Commission of Texas (PUCT) and a Presidential Permit from the U.S. Department of Energy. PBS&J is currently in the process of collecting and evaluating environmental data for the study area. As part of this effort, we are requesting that your agency/office relate any comments or concerns that you may have regarding the potential environmental effects from the construction of these facilities within the designated study area. Alternative routes/sites will be evaluated following the analysis of the existing environment in the study area and Sharyland will consider using existing facilities and ROW wherever feasible. PBS&J would appreciate receiving your comments regarding the natural, cultural, or human resources of the study area that are of concern to your agency/office.

Your comments will be an important consideration in the evaluation of alternative routes and in the assessment of impacts. In addition, should you identify any area requiring permits, easements, or other approvals by your agency/office, we would also appreciate receiving this information. If you have any questions concerning this project or our request for information, please call me or Mr. France Davis at (512) 327-6840. Your earliest reply will be appreciated.

Sincerely,

A handwritten signature in cursive script that reads 'Rob Reid'.

Rob Reid
Project Manager/Vice President

RRR:FD

attachment

cc: Mark Caskey (Sharyland)
France Davis (PBS&J)

Mr. Ken Merritt
Superintendent
Lower Rio Grande Valley NWR
U.S. Fish and Wildlife Service
Route 2, Box 202-A
Alamo, Texas 78516

Ms. Nancy Millar
President
Friends of the Wildlife Corridor
Route 2, Box 204
Alamo, Texas 78516

The Nature Conservancy of Texas
South Texas Office
P.O. Box 6281
McAllen, Texas 78502-6281

Ms. Selina King
Executive Director
Frontera Audubon Society
1027 S. Texas Blvd.
Weslaco, Texas 78596

Mr. Jim Chapman
Chairman
Lower Rio Grande Valley Chapter
Sierra Club
200 East 11th Street
Weslaco, Texas 78596

Sharyland Utilities Representatives will hand deliver the Informational Packets to the contacts on the following list.

The Honorable Ramon Garcia
Hidalgo County Judge
P.O. Box 58
Edinburg, Texas 78540

The Honorable Hector "Tito" Palacios
Hidalgo County Commissioner
Precinct 2
301 E. State
Pharr, Texas 78577

The Honorable Jose Flores
Hidalgo County Commissioner
Precinct 3
400 W. 13th St.

Mission, Texas 78572

Mr. Ken Jones
Executive Director
Lower Rio Grande Valley Development
Council
311 N. 15th Street
McAllen, Texas 78501-4705

The Honorable Norberto Salinas
Mayor
City of Mission
1201 E. 8th Street
Mission, Texas 78572

Mr. Isauro Trevino
City Manager
City of Mission
1201 E. 8th Street
Mission, Texas 78572

Mr. Sergil Zavala
City Planner
City of Mission
1201 E. 8th Street
Mission, Texas 78572

Mr. Pat Townsend
Mission Economic Development Association
901 Business Park Drive, Suite 200
Mission, Texas 78573-0968

The Honorable Leo Montalvo
Mayor
City of McAllen
P.O. Box 220
McAllen, Texas 78505

Ms. Julie Anne Rankin
City Planner
City of McAllen
P.O. Box 220
McAllen, Texas 78505

Mr. Mike Perez
City Manager
City of McAllen
P.O. Box 220
McAllen, Texas 78505

Mr. Mike Allen
President
McAllen Economic Development Corporation
6401 S. 33rd Street
McAllen, Texas 78503



TEXAS
HISTORICAL
COMMISSION

The State Agency for Historic Preservation

RICK PERRY, GOVERNOR

JOHN L. NAU, III, CHAIRMAN

F. LAWRENCE OAKS, EXECUTIVE DIRECTOR

June 02, 2003

Rob R. Reid
Senior Manager/Vice President
PBS&J
206 Wild Basin Road, Suite 300
Austin, Texas 78746-3343

Re: Project review under Section 106 of the National Historic Preservation Act of 1966 and the Antiquities Code of Texas; Sharyland Utilities, L.P.'s proposed electric transmission line between an AC/DC Converter Station and the Comision Federal de Electricidad (CEF) electrical system, Tamaulipas, Mexico), Hidalgo County, Texas (PUC, U.S. Dept. of Energy)

Dear Mr. Reid:

Thank you for your correspondence describing the above referenced project. This letter serves as comment on the proposed federal undertaking from the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission. As the state agency responsible for administering the Antiquities Code of Texas, these comments also provide recommendations on compliance with state antiquities laws and regulations.

The review staff, led by Debra L. Beene, has completed its review. Much of the study area has a moderate to high probability of containing cultural resources; therefore, a cultural resources survey may be required. However, without a specific project map we cannot determine whether the precise area of potential effect (APE) has been previously surveyed or whether one would have been necessary. We will be pleased to review the project again once we receive the requested information. To facilitate a quick review, consider having a PBS&J archeologist review the transmission line APE and determine whether it was previously surveyed and if not, locate the high probability areas for investigation.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this federal and state review process, and for your efforts to preserve the irreplaceable heritage of Texas. **If you have any questions concerning our review or if we can be of further assistance, please contact Debra L. Beene at 512/463-5865.**

Sincerely,

A handwritten signature in cursive script, appearing to read "F. Lawrence Oaks".

for
F. Lawrence Oaks, State Historic Preservation Officer

FLO/dlb



An employee-owned company

December 3, 2003

RECEIVED

DEC 08 2003

TEXAS HISTORICAL COMMISSION

Mr. Mark Denton
Texas Historical Commission
PO Box 12276
Austin, TX 78711-2276

**Re: Draft Survey Report Submittal, Sharyland Utilities-Mexico Tie Transmission Line Project,
Hidalgo County, Texas; PBS&J Project No. 441216.00**

Dear Mr. Denton:

PBS&J hereby submits on behalf of Sharyland Utilities and their agent Sutherland, Asbill and Brennan, LLP., one copy of the draft survey report for the Sharyland Utilities-Mexico Tie Transmission Line Project, Hidalgo County, Texas. This project requires your agency's review as a Section 106 undertaking, but does not require a state antiquities permit for archaeological investigation because the project area is and will be entirely privately owned. I look forward to receiving your concurrence or comments on the assessments and recommendations presented in the report. If you have any questions please feel free to contact me at 342-3367 or bmdixon@pbsj.com.

Sincerely,

Boyd Dixon

Dr. Boyd Dixon
Project Archaeologist

Xc: F. Davis, PBS&J w/o enclosure
J. Bushee, SAB w/o enclosure

Encl.

CONCUR	
by	<i>William C. Pratt</i>
for F. Lawrence Oaks State Historic Preservation Officer	
Date	<i>1/2/04</i>

DRAFT	
ADD ON FILE	
Please submit report copies	
by	<i>William C. Pratt</i>
for F. Lawrence Oaks State Historic Preservation Officer	
Date	<i>1/2/04</i>



Federal Emergency Management Agency

Region VI
Federal Regional Center
800 North Loop 288
Denton, TX 76201-3698

June 10, 2003

Rob Reid
Project Manager
PBS&J
206 Wild West Road, Suite 300
Austin, Texas 78746

Dear Mr. Reid:

This letter is in response to your correspondence of May 27, 2003, in which you describe a project Hidalgo County, PBS&J Job Number 441216.00.

Hidalgo County participates in the National Flood Insurance program (NFIP). Therefore, all development must be reviewed by the County Floodplain Administrator, Ms. Sylvia Sanchez, to ensure compliance with the County Flood Damage Prevention Court Order.

If you require any further assistance, please feel free to call me at 940-898-5128.

Sincerely,

Carlton R. Watts



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
Corpus Christi Regulatory Field Office
5151 Flynn Parkway, Suite 306
Corpus Christi, Texas 78411-4318

June 10, 2003

Regulatory Branch

SUBJECT: D-14827

Mark Caskey
Sharyland Utilities, L.P.
4403 W. Military Road, Suite 712
McAllen, Texas 78503

Dear Mr. Caskey:

The U.S. Army Corps of Engineers (Corps) is responding to a request on your behalf, submitted by PBS&J, in letter dated May 27, 2003. The proposed project, Sharyland Electric Transmission Facilities, is located within Hidalgo County, Texas.

The Corps has the authority to regulate certain work under the provisions of Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act. Section 404 regulates the discharge of dredged and fill material into waters of the United States, which includes all tidal waters, and wetlands adjacent to tidal and nontidal waters. Isolated wetlands and outlying areas that are seasonally saturated may be regulated under the provisions of Section 404 depending on their relationship with interstate commerce.

The information you provided states that the project consists of the construction of new 138-kilovolt (kV) DC tie transmission line, approximately 1 to 3 miles in length, and built on steel or concrete single pole structures within a 100 foot wide right-of-way (ROW). While the information provided does not describe construction methods, the pipeline appears to cross the Rio Grande River, a water of the United States. If work is proposed for this area a Department of the Army permit will be required, in addition if work is proposed in any other water bodies or wetlands, a permit may be required. It is possible that impacts associated with transmission line installations would qualify for a Nationwide Permit 12 Utility Line Activities.

This preliminary determination is valid for 5 years from the date of this letter unless new information warrants a revision of the determination prior to the expiration date. Please reference determination number D-14827 in future correspondence pertaining to this project. If you have any questions concerning this matter, please contact Shelly Carter at the letterhead address or by telephone at 361-814-5847.

Sincerely,

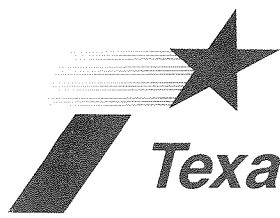
A handwritten signature in black ink, appearing to read "Lloyd Mullins", written in a cursive style.

Lloyd Mullins
Unit Leader,
Corpus Christi Regulatory Field Office

Enclosure

Copy furnished:

Rob Reid, PBS&J, 206 Wild Basin Road, Suite 300, Austin, Texas 78746



Texas Department of Transportation

AVIATION DIVISION

125 E. 11TH STREET • AUSTIN, TEXAS 78701-2483 • 512/416-4500 • FAX 512/416-4510

June 12, 2003

Mr. Rob Reid / PBS&J
206 Wild Basin Road, Suite 300
Austin, TX 78746

Dear Mr. Reid:

I received your letter dated May 27, 2003, concerning the proposed construction of a electric transmission facility in Hildalgo County.

Title 14, US Code, Part 77 of the Federal Aviation Administration's (FAA) Federal Aviation Regulations (FAR) requires notice to the FAA if the facility to be constructed fits either of the below listed conditions:

77.13(2)(i) Any construction or alteration which obstructs a slope of one foot of vertical height for each 100' of horizontal distance out to a total distance of 25,000' from the nearest point on any runway at a public use airport with at least one runway, existing or planned, more than 3200' in length or:

77.13(1) Any construction or alteration of more than 200' above the surface of the ground at its location.

There is one public use airport which may be within the study area which meets the criteria of 77.13(2)(i): McAllen International Airport (KMFE) at 26-10-33.0N / 098-14-19.0W Airport Reference Point. If the proposed construction is within the above criteria, the FAA must be notified in four copies using FAA Form 7460-1, "Notice of Proposed Construction or Alteration". Copies are enclosed. Additionally, if within the criteria as above, the Director of Aviation for McAllen should be contacted at 2500 S. Bicentennial, McAllen, Texas 78503 (956) 682-9101 to coordinate any construction.

If you have any questions, please feel free to contact me at (512) 416-4507 or <wgunn@dot.state.tx.us>

Sincerely,


William B. Gunn



An employee-owned company

May 27, 2003

Ms. Linda Howard
Manager, Planning & Programming
Texas Department of Transportation
Department of Aviation
125 East 11th Street
Austin, Texas 78711

PBS&J Job No. 441216.00

Dear Ms. Howard:

Sharyland Utilities, L.P. (Sharyland) is proposing to construct new electric transmission facilities in Hildalgo County, Texas. Specifically, Sharyland is planning to build a new 138-kilovolt (kV) DC tie transmission line between an AC/DC Converter Station and the Comision Federal de Electricidad (CFE) electrical system in the State of Tamaulipas, Republic of Mexico. The location of the study area is shown on the attached figure. The new line will be approximately 1 to 3 miles long, depending upon the route selected, and built on steel or concrete single-pole structures within a 100-ft wide right-of-way (ROW).

PBS&J is preparing an Environmental Assessment and Alternative Route Analysis for the project to support Sharyland's applications for a Certificate of Convenience and Necessity (CCN) from the Public Utility Commission of Texas (PUCT) and a Presidential Permit from the U.S. Department of Energy. PBS&J is currently in the process of collecting and evaluating environmental data for the study area. As part of this effort, we are requesting that your agency/office relate any comments or concerns that you may have regarding the potential environmental effects from the construction of these facilities within the designated study area. Alternative routes/sites will be evaluated following the analysis of the existing environment in the study area and Sharyland will consider using existing facilities and ROW wherever feasible. PBS&J would appreciate receiving your comments regarding the natural, cultural, or human resources of the study area that are of concern to your agency/office.

Your comments will be an important consideration in the evaluation of alternative routes and in the assessment of impacts. In addition, should you identify any area requiring permits, easements, or other approvals by your agency/office, we would also appreciate receiving this information. If you have any questions concerning this project or our request for information, please call me or Mr. France Davis at (512) 327-6840. Your earliest reply will be appreciated.

Sincerely,

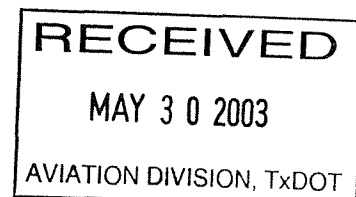
A handwritten signature in cursive script that reads 'Rob Reid'.

Rob Reid
Project Manager/Vice President

RRR:FD

attachment

cc: Mark Caskey (Sharyland)
France Davis (PBS&J)



United States Department of Agriculture



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

June 12, 2003

Mr. Rob R. Reid
Project Manager/Vice President
PBS&J
206 Wild Basin Road, Suite 300
Austin, Texas 78746

Dear Mr. Reid:

We have reviewed the proposed construction of new electric transmission facilities in Hidalgo County, Texas. Based on the data submitted, the project should not have any adverse environmental impacts on the natural resources in the area. This office does not require permits, easements, or other approvals.

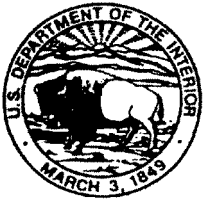
Thank you for the opportunity to provide comments on this proposed project.

Sincerely,

A handwritten signature in cursive script that reads "Salvador Salinas".

For

LARRY D. BUTLER, Ph.D.
State Conservationist



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
June 13, 2003

Mr. Rob Reid
Project Manager
PBS&J
206 Wild Basin Road
Suite 300
Austin, Texas 78746

Consultation No. 2-11-03-I-0304

Dear Mr. Reid:

This responds to the letter received on June 2, 2003, regarding the effects of the proposed electric transmission facilities on species federally-listed or proposed for listing as threatened or endangered occurring within Hidalgo County, Texas. In addition, your project was evaluated with respect to wetlands and other important fish and wildlife resources.

Sharyland Utilities, L.P. (Sharyland) is proposing to construct new electric transmission facilities in Hidalgo County. Sharyland is planning to build a new 138-kilovolt (kV) DC tie transmission line between an AC/DC Converter Station and the Comision Federal de Electricidad (CFE) electrical system in the State of Tamaulipas, Mexico. The new line will be approximately 1 to 3 miles long, depending upon the route selected, and built on steel or concrete single-pole structures within a 100-ft wide right-of-way (ROW).

PBS&J is preparing an Environmental Assessment and Alternative Route Analysis for the project to support Sharyland's application for a Certificate of Convenience and Necessity from the Public Utility Commission of Texas. PBS&J is currently in the process of collecting and evaluating environmental data for the study area. Alternative routes/sites will be evaluated following the analysis of the existing environment in the study area and Sharyland will consider using existing facilities and ROW wherever feasible.

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
 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 rufivirgatus) - SOC
 Tropical parula (Parula pitaiayumi 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 nigrocoerulea subtropica) - SOC
 Maculated manfreda skipper (Stallingsia maculosus) - SOC

The Alternative Route Analysis study area indicated on the map includes several Lower Rio Grande Valley National Wildlife Refuge (LRGVNWR) tracts of land. These tracts of land include Madero, Tortuga Banco, Cottam and Gabrielson (please see attached map). The Service is concerned about environmental impacts to these refuge tracts that are part of the wildlife corridor. As you are aware, the Anzalduas International Bridge will be located between Cottam and Gabrielson refuge tracts which will fragment the wildlife corridor between these two tracts. The Service recommends plant surveys to be conducted if impacts to native brush or endangered species is required anywhere throughout the entire selected route. Also, if the project requires an easement through the Service's LRGVNWR tracts for a right-of-way, then it would require a compatibility determination conducted by the Refuge in association with right-of-way application. This compatibility determination is used to examine whether the proposed use interferes or detracts from the purpose for which the Refuge was established. No right-of-way can be issued if the project is determined to be incompatible. For further information on the application procedures, please contact Christina Montoya (Refuge Operation Specialist) for the LRGVNWR at (956) 784-7540.

Keep in mind that ten valley communities, TPWD and others including the Service are about to spend \$21 million dollars on World Birding Centers to protect and to promote birdwatching to further the Rio Grande Valley's ecotourism industry. Bentsen State Park has been selected to be the main birding center for the entire Lower Rio Grande Valley. Birding in the Valley is conservatively worth over \$100 million to the local economy annually, and is expected to grow in the Valley as an industry.

The ocelot and jaguarundi inhabit dense native brushland, generally occurring near watercourses, throughout South Texas. Population declines in both species of felids are primarily due to habitat loss associated with clearing of brush. In a July 7, 1992 report, "Potential Impacts of the proposed Anzalduas International Bridge upon Endangered Cats," Dr. Michael E. Tewes, the foremost recognized authority on ocelots and jaguarundi in South Texas, describes the results of his examination of two LRGNNWR tracts of native habitat that occur on either side of the proposed international crossing. The Gabrielson Unit includes the habitat tract immediately west of the proposed international crossing and the Cottam Unit includes the tract immediately east of the crossing. Dr. Tewes believes that a significant patch of optimal ocelot habitat covers much of the Gabrielson Unit. The southern portion of habitat within the Gabrielson Unit (the area parallel to the river) contains a less dominant shrub layer and would normally be classified as marginal or non-habitat for the ocelot. However, the proximity of the optimal habitat within the Gabrielson Unit lends a potential ocelot use value to this portion as (1) a "buffer habitat" to reduce the disturbance effects of anthropogenic activities, (2) "overflow habitat" for ocelots from nearby saturated optimal habitat, and (3) "travel habitat" for dispersing or transient ocelots. At the time of the report, it was quite possible that the Gabrielson Unit was either currently occupied by one or a few ocelots or may possibly experience periodic occupancy by dispersing or transient ocelots during the year.

According to Dr. Tewes' report, the Cottam Unit contained less optimal habitat than the Gabrielson Unit. Much of the Cottam Unit appeared to be old farmland undergoing successional transformation. Some areas within the Cottam Unit may contain optimal habitat, particularly sites within the resacas (ox-bow) landscape feature. Also, narrow corridor habitat occurs along the banks of the Rio Grande. A resident ocelot can regularly travel two to three miles within its established home range. Home range data from the Santa Ana National Wildlife Refuge (SANWR) demonstrated that ocelots will leave large patches and travel to surrounding sites. Consequently, the proximity of optimal habitat on the Gabrielson Unit similarly lends increased value to the habitats on the Cottam Unit. Additional tracts of native habitats occur along the river west of the Gabrielson Unit and east of the Cottam Unit, increasing the likelihood that ocelots move through both.

Ocelots frequently travel along habitat corridors parallel to linear water courses (e.g., resacas, rivers). Because two large tracts of acquires native habitat exists on both sides of the proposed international crossing, the vegetation adjacent to the river has additional value as a potential travel corridor for ocelots. The radio tracking of the ocelot on SANWR indicated this cat swims across the Rio Grande to use habitat on both sides of the river. Consequently, removal of habitat on either side of the river may have an impact on a resident ocelot.

Regarding other important fish and wildlife resources, please keep in mind that many bird species protected under the Migratory Bird Treaty Act may nest in an area containing trees or other suitable habitat. As the Federal agency responsible for the protection of migratory birds, the Service recommends vegetation disturbances potentially associated with these activities avoid the general nesting period of March through August or that areas proposed for disturbance be surveyed first for nesting birds, in order to avoid the inadvertent destruction of nests, eggs, etc.

Birds of prey (eagles, hawks, owls, etc) frequently use powerlines and support structures for perching and nesting. Raptors can be electrocuted while using power lines, thus contributing to the cumulative mortality factors effecting these biologically important sensitive species. Electrical distribution lines carrying voltages between 12kv to 69kv present the greatest threat of electrocution, in areas supporting high concentrations and diversity of raptors (e.g. southwest region of the United States).

Standard techniques have been developed to prevent raptor electrocutions at electrical distribution lines. The latest guidance is included in the publication: Suggested Practices for Powerlines-State of the Art in 1981/ Raptor Research. Report No. 4, Raptor Research Foundation, Inc. Department Veterinary Biology, University of Minnesota, St. Paul, MN 55108.

As a Federal agency responsible for the protection of migratory birds (including birds of prey), the U.S. Fish and Wildlife Service recommends that all new or modified electrical distribution lines be designed and constructed to prevent the electrocution of raptors, using the above referenced techniques. Proper design includes adequate separation of energized hardware or insulation of wires sufficient separation cannot be attained. The use of grounded steel cross-arm braces should be avoided. The measures should be implemented on each line and pole associated with new or converted lines. Failure to implement these measures could subject companies to civil or criminal liability under the Migratory Bird Treaty Act, Endangered Species Act, and Bald Eagle Protection Act.

With regard to wetland resources, many in the area occur as resacas (relic river oxbows), creek crossings, coastal/inland potholes, marshes, etc. Executive order 11990 asserts that each Federal agency shall provide leadership and take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities. The U.S. Army Corps of Engineers should be contacted for permitting requirements under section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act, if it appears that proposed construction plans could impact wetlands.

The Service recommends that the alternative route to be selected avoid the LRGVNWR tracts of land; the process for a compatibility determination is lengthy and not guaranteed that a ROW will be given if it is found not compatible with what the refuge was established for. Also, select a route that avoids taking of ocelot habitat by avoiding or minimizing brush clearing along the route and along the river; leave a vegetation buffer along the river where the transmission line will cross into Mexico.

This letter is for general information only and does not constitute a review and clearance over potential effects to federally-listed species resulting from any specific project or activity. Upon completion of the route alternative selection and environmental document, 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,

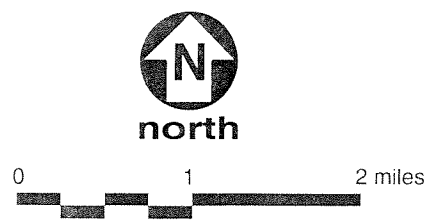


Ernesto Reyes
Senior Fish & Wildlife Biologist

For
Allan M. Strand
Field Supervisor

cc:

Field Supervisor, U.S. Fish and Wildlife Service, Corpus Christi, TX
Christina Montoya, LRGVNWR ROS, Alamo, TX



- Engineering
- Environmental Consulting
- Surveying

STUDY AREA LOCATION

SHARYLAND – MEXICO DC TIE PROJECT

Base Map: TxDOT County Highway Map; Hidalgo County, Texas

I:/projects/hc1/sharyland/441216/cad/studyarea.dgn



INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

OFFICE OF THE COMMISSIONER
UNITED STATES SECTION

JUL 30 2003

Mr. Rob Reid
Project Manager/Vice President
PBS&J
206 Wild Basin Road Suite 300
Austin, Texas 78746

Dear Mr. Reid:

The United States Section, International Boundary and Water Commission (USIBWC) appreciates the opportunity to provide comments on the Electrical Transmission Line crossing the Rio Grande in Hidalgo County, Texas, proposed by Sharyland Utilities, L.P. (Sharyland) described in your May 27, 2003 letter (PBS& J Job #441216.00). USIBWC staff attended a project briefing by Mr. James M. Bushee and Mr. Ralph Goodlet, at our Headquarters Office in El Paso, Texas, on June 18, 2003.

The USIBWC understands the proposed project is for the construction and operation of an electrical transmission line connecting services in Hidalgo County, Texas with facilities in Tamaulipas, Mexico. The installations will provide electrical service to customers in the southeastern Texas and northeast Tamaulipas, Mexico. The project proponent, Sharyland, is seeking authorization to construct, operate, and maintain electrical transmission facilities in both the United States and Mexico to import and export electrical energy. The new system will convert alternating current to direct current to allow transmission in two directions. The proposed project alternatives include construction and operation of up to 3 miles of transmission line. Sharyland is in the process of developing an Environmental Assessment and Alternative Route Assessment for the project to support a Certificate of Convenience and Necessity from the Public Utility Commission of Texas and a Presidential Permit from the United States Department of Energy. The final route for the transmission line has not been selected.

The route alternatives for the project include transmission lines which cross the Rio Grande and properties owned and/or managed by the USIBWC. Construction of structures within the floodway of the Rio Grande is not anticipated. The USIBWC must authorize the crossing of this property. The project description indicates the line will have a 100-foot wide right-of-way. The project description and environmental assessment should clearly indicate if clearing of this right-of-way in the Rio Grande floodway is required. Once the final alternative is selected, the proponent should contact the USIBWC for guidance on securing this authorization.

The USIBWC reviews the environmental impacts of each project in accordance with the agency procedures for implementation of the National Environmental Policy Act (NEPA). Typically this requires documentation that consultations with United States Army Corps of Engineers (USACOE), the United States Fish and Wildlife Service (USFWS) and the Texas Historical Commission (THC) have been completed. Based on the project description, one concern in this area is the migration corridor for the gulf coast jaguarundi and the ocelot. The USIBWC has implemented a modified maintenance program in some areas of the Rio Grande floodway to preserve this corridor. If the project crosses the corridor, the proponent should mitigate impacts in accordance with guidance from the USFWS. Impacts to migratory bird species and raptors must be evaluated. The proponent is encouraged to incorporate the Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996, developed by the "Avian Power Line Interaction Committee." The USIBWC is concerned with impacts to transboundary air and water quality associated with development near the international boundary. In many locations along the international boundary, rapid development has resulted in detrimental impacts to shared air and water resources. Reasonably foreseeable development which is related to this project should be evaluated in accordance the Council on Environmental Quality guidance on cumulative impacts. In addition, ongoing maintenance work that will occur within the floodway must be evaluated. The Environmental Assessment supporting the Presidential Permit application should include most information required for the USIBWC evaluation.

The USIBWC requests that proposed construction activities be accomplished in a manner that does not change historic surface runoff characteristics at the international boundary. This requirement is intended to ensure that developments in one country will not cause damage to lands or resources in the other country. The proponent must ensure structures constructed along the United States/Mexico border are maintained in an adequate manner and that liability issues created by these structures are addressed.

The USIBWC must review the Environmental Assessment, draft drawings, and supporting documentation for the selected alternative. Drawings must show the location of each component in relation to the international boundary and the Rio Grande. One drawing should be a cross section of the Rio Grande illustrating the elevation of the power line crossing in relation to the flood level of the river and the top of the levees. The attached criteria provides guidance on allowable clearances for electrical and telephone lines. These criteria are general and are minimums based on residential voltages and telephone lines. Clearance must be adequate to ensure the safety of USIBWC equipment and personnel operating near the power line. Construction plans for the selected alternative and supporting information should be submitted to the USIBWC as soon as possible. The USIBWC requires that final engineering drawings be submitted to the USIBWC for review and approval prior to beginning construction of the proposed electrical transmission line and related facilities. Works in Mexico must be reviewed by the appropriate agencies in Mexico and be constructed in accordance with Mexican laws. USIBWC project authorization is limited to property within the United States of America. Typically, for an international project, the proponent from the United States joins with a business entity in Mexico and each firm secures the required authorizations in their respective countries.

Project proponests in Mexico should provide plans and project information to the Mexican Section of the International Boundary and Water Commission (MXIBWC) in Ciudad Juarez, Chihuahua, Mexico. The USIBWC requires that the proponent verify that coordination with proper authorities in Mexico is complete prior to construction.

Thank you for the opportunity to provide comments on the proposed electrical transmission line. Please continue to keep us informed with the progress of the project. If you have any questions regarding this information, please call me at (915) 832-4740.

Sincerely,

A handwritten signature in cursive script that reads "Sylvia A. Waggoner".

Sylvia A. Waggoner

Division Engineer

Environmental Management Division

Attachment:

As stated

XIII ELECTRICAL AND TELEPHONE CRITERIA FOR OVERHEAD WIRE CROSSING

The overhead transmission line shall be constructed and maintained in such a manner as to provide a minimum vertical clearance (at the temperature of 60 degrees Fahrenheit) of not less than 28 feet above the levee crown and at least 12 feet (3.7 meters) above the floodway design high water surface level in the area of the floodway channel.

No structure (poles or guy wires) shall be located closer than 35 feet from the toes of any levee. No structure (poles or otherwise) shall be located closer than 15 feet from the top of any channel bank.

Guy wires may be anchored within the USIBWC right-of-way in such a manner that they do not interfere with the operation and/or maintenance of the channel, levees, or related structures. A witness post, not less than five feet (5') above the ground, shall be installed by each anchor or the cable shall be wrapped up to a point at least five feet (5') above the ground with a bright colored material to make it obviously visible.

It shall be the Sponsor's responsibility to maintain the areas clear of brush within a ten foot (10') radius of each pole, under the guy wires and around the anchors, on both sides of the levee and within the USIBWC right-of-way limits.

XIV LOW DAMS OR DIVERSIONS OF FLOWS

The Sponsor shall submit plans, hydraulic and structural computations and specifications for low dams or other obstructions for review and comments prior to the construction of any type dam structure in a floodway area. These plans will be reviewed to determine if adverse hydraulic or structural effects would occur within the floodway as a result of the proposed construction. Prior to an extensive engineering study for any type of water barrier in a floodway, the concept plan, proposed location, and purpose shall be reviewed by the USIBWC and MXIBWC (international projects).

Further, the Sponsor(s) are responsible for obtaining the proper water rights permits from the Texas National Resource Conservation Commission, Water Master before providing diversions structure plans to the USIBWC. Additional permits mentioned in Section IV must also be obtained.

Should such diversions be permissible, the Sponsor of the facilities shall install at his expense, the measuring devices that the USIBWC considers necessary to carry out treaty-required water measurements and water accounting.

XV CONSTRUCTION OF RECREATION FACILITIES

The Sponsor shall submit plans to USIBWC for review and approval on any proposed recreation type facilities to be constructed in an existing or approved floodway area. Each plan including hydraulic computations will be reviewed for individual and cumulative effects to determine if the proposed construction would produce adverse effects on an existing or approved floodway area.



August 13, 2003

Mr. Rob Reid
PBS&J
206 Wild Basin Road, Suite 300
Austin, TX 78746

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ROBERT L. COOK
EXECUTIVE DIRECTOR

RE: Proposed new 138-kV electric transmission facilities, Hidalgo County.

Dear Mr. Reid:

This letter is in response to your request for concerns about potential environmental effects regarding the proposal by Sharyland Utilities to construct a new 138-kV DC tie transmission line. Texas Parks and Wildlife Department (TPWD) staff appreciates your interest in natural resources and provides the following comments to assist your planning efforts.

The proposed transmission line tie would be located between an AC/DC Converter Station in Hidalgo County, Texas and the Comision Federal de Electricidad (CFE) electrical system in the State of Tamaulipas, Republic of Mexico. The Department recommends that the new transmission line be constructed within existing, previously disturbed rights-of way (ROW) and easements, rather than clearing new ROW. Avoid fragmenting contiguous tracts of dense, native brush and clearing mature trees. Please find *TPWD Recommendations for Electrical Transmission Line Design and Construction* for your assistance.

Texas Parks and Wildlife recently provided the legislature with the Land and Water Resources Conservation and Recreation Plan. That plan will serve as a guide for the management of the fish and wildlife resources of the State for the coming years. This plan designates native prairies, grasslands and riparian habitats as the most important wildlife habitats, containing the highest numbers of rare species and are the most threatened. These habitat types will be a priority for TPWD in the future. Therefore, TPWD will be concentrating on reducing impacts to these habitats and when necessary, seeking compensation for impacts to those habitats that cannot be avoided or minimized.

Minimizing clearing of native vegetation is particularly important in riparian areas, which provide valuable wildlife habitat. If the transmission line crosses riparian areas staff recommends that the ROW width be reduced or the riparian area be crossed at the most narrow part of the corridor, to minimize habitat fragmentation. Staff recommends that Sharyland Utilities minimize removal of native vegetation within the riparian zone and destruction of inert microhabitats *i.e.* snags, brush piles, fallen logs, creek banks, pools, and gravel stream bottoms



Take a kid
hunting or fishing



Visit a state park
or historic site

as these provide habitat for a variety of fish and wildlife species and their food sources. Staging and disposal areas should be located in previously disturbed upland areas to avoid impacts to habitats associated with the riparian and aquatic systems. Find the attachment entitled *TPWD Guidelines for Construction and Clearing within Riparian Areas*.

The Clean Water Act (CWA) sets the basic regulatory framework for regulating discharges of pollutants to U.S. waters. Section 404 of the CWA establishes a federal program to regulate the discharge of dredge and fill material into waters of the U.S., including wetlands. The U.S. Army Corps of Engineers (COE) and the Environmental Protection Agency (EPA) are primarily responsible for making jurisdictional determinations and regulating wetlands under Section 404 of the CWA. The COE also makes jurisdictional determinations under Section 10 of the Rivers and Harbors Act of 1899. If the proposed construction would impact aquatic resources then the project sponsor should contact the U.S. Army Corp of Engineers (Corpus Christi Regulatory Field Office) for determination of jurisdictional wetlands and for permitting requirements. Compensation may be required for any encroachment into these areas.

In order to protect migratory birds construction activities should occur outside the March – August migratory bird nesting season of each year the project is authorized and lasting for the life of the project. Construction activities include (but are not limited to) removal of nests or nest structures, tree felling as well as vegetation clearing, trampling or maintenance. Additional information regarding the Migratory Bird Treaty Act may be obtained from the U.S. Fish and Wildlife Service Southwest Regional Office (Region 2) at (505) 248-6879.

Line alterations to prevent bird electrocutions should be completed prior to construction as all electrocutions may not be known or documented. Incorporation of preventative measures along portions of the routes that are most attractive to birds such as riparian corridors (or other areas indicated by frequent sightings) prior to any electrocutions is a preferred alternative. If you would like more information about avian mortality prevention measures, please contact me.

Please find the list of special species that occur in Hidalgo County. Measures should be taken to ensure that rare species are not present along the route and are not subject to adverse impacts. ROW and access easements often display exceptional biotic diversity and quality by representing isolated areas free from agricultural grazing and cultivation impacts. Consequently, caution should be taken to avoid any unique and rare plant communities that may occur. More site-specific information about rare species and wildlife refuges can be obtained

Mr. Reid
Page 3

from a search of the BCD database. A review of potential project impacts to endangered and threatened species can be obtained for a \$50 fee. For more information about the BCD or threatened and endangered species in the project area please contact Celeste Brancel at (512) 912-7021.

If any proposed route would affect area wildlife refuges, management areas, or parks, please include that information in the environmental document and coordinate with area managers.

We appreciate the opportunity to review and comment on your project during the planning stages. Please send maps and descriptions of route alternatives when they become available. If you have any questions contact me in San Marcos at (512) 396-9211.

Sincerely,

A handwritten signature in cursive script that reads "Renée Fields".

Renée Fields
Wildlife Habitat Assessment Program
Wildlife Division

/jrf

Attachments

TPWD Recommendations for Electrical Transmission Line Design and Construction

Construction of the line should be performed to avoid adverse environmental impact and to restore or enhance environmental quality to the greatest extent practical. In order to minimize the possible project effects upon wildlife, the following measures are recommended:

1. Use wood or non-conducting crossarms to minimize the possibility of electrical contact with perching birds.
2. When possible, install electrical equipment on the bottom crossarm to allow top crossarm for perching.
3. To protect raptors, procedures should be followed as outlined in:
"Suggested Practices for Raptor Protection on Power Lines, the State of the Art in 1996,"
by Richard R. Olendorff, A. Dean Miller and Robert N. Lehman; distributed by the
Raptor Research Foundation Incorporated, for Edison Electric Institute.
REA Bulletin 61-10, "Protection of Bald and Golden Eagles from Power Lines."
USDI-EPA report entitled "Impacts of Transmission Lines on Birds in Flight,"
(FWS/OBS-78/48).
4. Construction should avoid identified wetland areas. Coordination with appropriate agencies should be accomplished to ensure regulatory compliance. Construction should occur during dry periods.
5. Construction should attempt to minimize the amount of flora and fauna disturbed. Reclamation of construction sites should emphasize replanting with native grasses and leguminous forbs.
6. Existing rights-of-way should be used to upgrade facilities, where possible, in order to avoid additional clearing and prevent adverse impacts associated with habitat loss and fragmentation of existing blocks of wooded habitat.
7. Because forest and woody areas provide food and cover for wildlife, these cover types should be preserved. Mature trees, particularly those which produce nuts or acorns, should be retained. Shrubs and trees should be trimmed rather than cleared.
8. All pole design should be single phase (without arms), where possible, to preserve the aesthetics of the area.
9. Lines should be buried, when practical.
10. Birds typically establish flight corridors along and within river and creek drainages. Transmission lines that cross or are located very near these drainages should have line markers installed at the crossings or closest points to the drainages to reduce the potential of collisions by birds flying along or near the drainage corridors.
11. Line alterations to prevent bird electrocutions should not necessarily be implemented after such events occur, as all electrocutions may not be known or documented. Incorporation

of preventative measures along portions of the routes that are most attractive to birds (as indicated by frequent sightings) prior to any electrocutions is much preferred.

12. Transmission lines should be designed to cross streams at right angles, at points of narrowest width, and/or at the lowest banks whenever feasible to provide the least disturbance to stream corridor habitat.
13. Implementation of wildlife management plans along rights-of-way should be considered whenever feasible.

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
- 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
- Rose-throated Becard** (*Pachyrhamphus aglaiae*) - riparian trees, woodlands, open forest, scrub, and mangroves; breeding April to July T

	Federal Status	State Status
Sennett's Hooded Oriole (<i>Icterus cucullatus senneti</i>) - often builds nests in and of Spanish moss (<i>Tillandsia usneoides</i>); feeds on invertebrates, fruit, and nectar; breeding March to August		
Tropical Parula (<i>Parula pitaiayuma</i>) - dense or open woods, undergrowth, brush, and trees along edges of rivers and resacas; breeding April to July		T
White-faced Ibis (<i>Plegadis chihi</i>) - 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 (<i>Buteo albicaudatus</i>) - 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 (<i>Mycteria americana</i>) - 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 (<i>Buteo albonotatus</i>) - rough, deep, rocky canyons and streamsides in semiarid mesa, hill, and mountain terrain; breeding March to July		T

*** FISHES ***

Bluntnose Shiner (<i>Notropis simus</i>) (extirpated) - main river channels, often below obstructions over substrate of sand, gravel, and silt; damming and irrigation practices presumed major factors contributing to decline		T
River Goby (<i>Awaous banana</i>) - 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 Silvery Minnow (<i>Hybognathus amarus</i>) (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 (<i>Cicindela nigrocoerulea subtropica</i>) - 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		
Maculated Manfreda Skipper (<i>Stallingsia maculosus</i>) - 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 State
Status Status

*** MAMMALS ***

- Cave Myotis Bat (*Myotis velifer*)** - colonial and cave-dwelling; also roosts in rock crevices, old buildings, carports, under bridges, and even in abandoned Cliff Swallow (*Hirundo 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
	T

Northern Cat-eyed Snake (*Leptodeira septentrionalis*) - Gulf Coastal Plain south of the Nueces River; thorn brush woodland; dense thickets bordering ponds and streams; semi-arboreal; nocturnal

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

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

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

*** 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

Small papillosus cactus (*Echinocereus papillosus* var. *angusticeps*) - endemic; sandy to gravelly soils in grasslands or mesquite-acacia shrublands

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

Texas ayenia (*Ayenia limitaris*) - woodlands on alluvial deposits on floodplains and terraces along the Rio Grande; flowering throughout the year with sufficient rainfall

Texas windmill-grass (*Chloris texensis*) - endemic; sandy to sandy loam soils in open to sometimes barren areas in prairies and grasslands, including ditches and roadsides; flowering in fall

Vasey's adelia (*Adelia vaseyi*) - subtropical woodlands in Lower Rio Grande Valley; flowering January-June

LE	E
LE	E

	Federal	State
	Status	Status
Walker's manioc (<i>Manihot walkerae</i>) - periphery of native brush in sandy loam; also on	LE	E
caliche cuestras?; flowering April-September (following rains?)		

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

CI - 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.

Appendix B

Cultural Resources Report

Document No. 030345
PBS&J Job No. 441216

ARCHAEOLOGICAL SURVEY OF
SHARYLAND UTILITIES-MEXICO TIE
TRANSMISSION LINE PROJECT
HIDALGO COUNTY, TEXAS

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ABSTRACT

On behalf of Sharyland Utilities and their legal representatives, Sutherland, Asbill and Brennan, LLP, PBS&J was contracted to conduct a survey level archaeological examination of the proposed Sharyland-Mexico Tie project right-of-way (ROW) near McAllen, Texas. The proposed project is intended to provide a 138 kV single-circuit direct current (DC) tie between electrical utility facilities in Texas and Mexico. The circuit will be supported by single-pole support structures that will range in height from 65 to 100 feet (19.8 to 30.5 meters). Foundation footings for the support poles will vary in depth, but could be in excess of 15 feet (4.5 meters). No cultural resources were encountered in the ROW during the archaeological survey. Consequently, no artifacts will be subject to curation.

Given the negative results of shovel testing west of West Military Highway, and the degree of landscape modification due to canal and drainage ditch construction east of West Military Highway, it is unlikely that shallow prehistoric deposits remain intact within the ROW. Deeper mechanical testing efforts are not recommended because the amount of excavation required to test the full depth of project-related impacts would cause far greater disturbance to possible cultural deposits than drilling of the actual utility pole locations. Therefore, once the precise locations of utility poles can be determined and staked in the ROW with a high degree of accuracy, monitoring of construction is recommended in the T¹, T², and T³ terraces at Poles 1, 2, and 3, to record any cultural materials displaced from deeply buried contexts. In the event that human skeletal remains are encountered, construction at the location of the find should be stopped and the Texas Historical Commission notified to determine the proper treatment of the remains.

I. INTRODUCTION

This report has been prepared on behalf of Sharyland Utilities and their legal representatives, Sutherland, Asbill and Brennan, LLP, to document the results of a survey level archaeological examination of the proposed Sharyland-Mexico Tie project right-of-way (ROW) near McAllen, Texas. The need for an archaeological survey was determined via a telephone conference between PBS&J cultural resources staff and Bill Martin of the Texas Historical Commission (THC) on September 16, 2003. Construction of this project will require a Presidential Permit from the U.S. Department of Energy (DOE). Consequently, impacts to cultural resources must be considered under Section 106 of the National Historic Preservation Act. However, because the project will be privately owned and operated, compliance with the Texas Antiquities Code is not required.

The preferred route for the proposed project was selected through a previous route analysis process conducted and documented in a draft environmental assessment currently under review by the Public Utilities Commission of Texas. This report will be appended to a separate environmental assessment that is being prepared by PBS&J for federal review and coordination through the DOE. The proposed project is intended to provide a 138 kV single-circuit DC tie between electrical utility facilities in Texas and Mexico. The circuit will be supported by single-pole support structures that will range in height from 65 to 100 feet (19.8 to 30.5 meters [m]). Foundation footings for the support poles will vary in depth, but could be in excess of 15 feet (4.5 m). Preliminary locations for the eight support poles are illustrated in Figure 1.

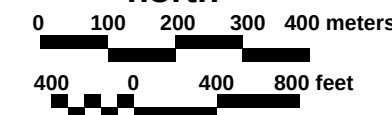
The ROW is approximately 4,300 feet (1,400 m) in length (Figure 1) and is described hereafter in three segments. The first segment is from the edge of the Rio Grande (Figure 2a) to the Pole #1 location (Figure 2b). The second segment is a diagonal from Pole #1 across an earthen berm and a raised access road surrounding a holding pond and pumping station (Figure 3a) to Pole #2 on the east side of an International Boundary and Water Commission (IBWC) flood control levee (Figure 3b). The third segment is from Pole #2 across the Union Pacific Railroad track and Farm-to-Market (FM) 1016 (West Military Highway) to the end of the Old Edinburg Canal remnant (Figure 4a). Poles #3 through #8 are located in Segment 3 between the Edinburg Canal berm and a lower berm formed from the excavation of an adjacent drainage ditch (Figure 4b).



- Preferred Route
- Existing Transmission Line
- La Lomita Historic District Boundary
- Pedestrian Survey
- ST1 Sterile Shovel Test
- P1 Proposed Pole Location
- ★ Historical Marker



north



Date of Photography: August 2000



- Engineering
- Environmental Consulting
- Surveying

Figure 1

MAP OF PROJECT AREA
WITH SHOVEL TEST AND
PEDESTRIAN SURVEY LOCATIONS

SHARYLAND - MEXICO TIE PROJECT





Figure 2a. Shovel Test ST1 setting on T¹ terrace, view to northwest.



Figure 2b. Shovel Test ST4 setting on T² terrace, view to northeast.



Figure 3a. Pump house on T¹ terrace, view to southwest.



Figure 3b. Spillway on north-south canal and T² terrace, view to northwest.



Figure 4a. Edinburg Canal from spillway to railroad bridge, view to northeast.

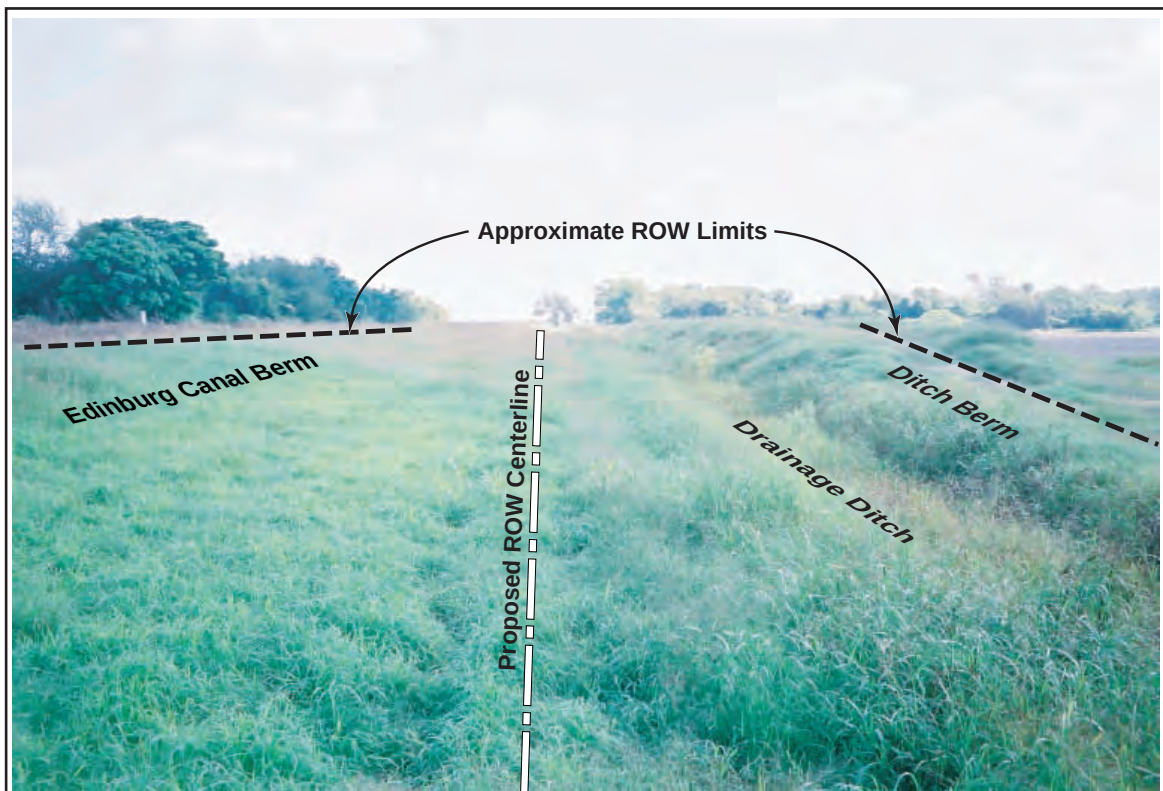


Figure 4b. Staked ROW between Edinburg Canal berm on left and ditch on right, view to northeast from West Military Road.

II. BACKGROUND INFORMATION

The following background section of the report includes information on the environmental and cultural setting of the project area, plus the results of a review of previous archaeological research conducted in the vicinity, and a review of historic literature relevant to the project area.

ENVIRONMENTAL SETTING

The project area is located along the U.S./Mexico border within the Interior Coastal Plains Physiographic Region (Bureau of Economic Geology (BEG) 1996). The plain was formed during the Cenozoic Era as rivers deposited large volumes of sediment into the deltas of the Gulf of Mexico (Swanson 1995). The topography is therefore very flat, with the exception of a small hill, locally referred to as a “Lomita,” that rises to approximately 135 feet (41.2 m) in the project vicinity.

Geology

Vicinity bedrock geology consists of Quaternary-aged Alluvium and the Tertiary-aged Goliad Formation. Recent alluvial deposits underlie the ROW. These alluvial materials consist of floodplain deposits associated with the Rio Grande and include mud, silts, and sands (BEG 1976). The Goliad Formation consists of clay, sand, sandstone, marl, caliche, limestone, and conglomerate and reaches a thickness of up to 600 feet (182.9 m) (BEG 1976).

Soils

Three general soil associations occupy the study area, as described by the Soil Conservation Service (SCS [now the Natural Resources Conservation Service (NRCS)] 1981). These Harlingen-Runn-Reynosa silty clay loam is located east of West Military Highway. The Rio Grande-Matamoros Association silt loam located between the river and the IBWC Canal. Camargo silt loams make up the remaining area between West Military Highway and the IBWC Canal.

Vegetation

Hidalgo County lies within the South Texas Plains Vegetational Area as delineated by Hatch et al. (1990). The South Texas Plains includes level to rolling land dissected by streams flowing to the Gulf of Mexico. Elevations range from sea level to approximately 1,000 feet (300 m) above mean sea level (MSL). Average annual precipitation ranges from 16 to 35 inches (40 to 89 cm), occurring mostly in the spring and fall. Summers are often characterized by drought conditions that are frequently of sufficient duration to depress crop growth.

The South Texas Plains vegetation area approximates the Tamaulipan Biotic Province of Texas (Blair 1950). Blair further describes the Lower Rio Grande Valley (Starr, Hidalgo, Cameron, and Willacy counties) as a distinct biotic district (the Matamorán) within the Tamaulipan Biotic Province (Blair 1952). Thorny brush is the dominant vegetation type in the Matamorán District. The Matamorán District has poorer drainage and more-luxuriant vegetation than northern portions of the Tamaulipan Biotic Province.

Climate, edaphic factors, and past human activity have influenced the vegetation of the Lower Rio Grande Valley, resulting in a shrubland climax of mixed-brush and acacia associations. The unique ecology of the Lower Rio Grande Valley is characterized by a combination of climate, vegetation, and wildlife associations unlike anywhere else in the U.S. (Jahrsdoerfer and Leslie 1988). Plants with western desert, northern, coastal, and tropical affinities comprise the vegetation community of the region. Historically, the Tamaulipan brushland was characterized by two vegetation communities, mesquital and chaparral.

The vegetation in the ROW consists of a mixture of agricultural crops, native brushlands, woodlands, and grasslands. Agricultural crops include food, forage, and fiber crops, with cotton, grain sorghum, sugar cane, and citrus being of primary importance. Native plant communities within the ROW include riparian and scrub forests. Riparian and scrub forests are associated with the Rio Grande and consist of several intergrading habitat types of taller stature than adjacent vegetation communities.

Fauna

The fauna of the Tamaulipan Biotic Province includes numerous neotropical species, numerous grassland species that also range north of the province, some Austroriparian species from the east, and a small number of Chihuahuan species from the west (Blair 1950, 1952). Numerous neotropical invertebrates and vertebrates are limited in their U.S. distribution to the Tamaulipan Biotic Province, and many are found within the U.S. only in the Lower Rio Grande Valley. The ROW supports an abundant and diverse avifauna on a seasonal basis.

CULTURAL SETTING

The prehistory of the Rio Grande Plains of Texas is poorly understood. Archaeological investigations have primarily been limited to surface collections by professional and amateur archaeologists. To date, no extensive controlled excavations have been undertaken in the area and, except for occasionally-found burials, definable subsurface components and/or stratigraphy are only rarely found south from Baffin Bay to the Rio Grande. The sections below briefly summarize developmental stages in the region.

Paleoindian

The earliest evidence of man in the Rio Grande Plains Archeological Region is recognized as the Paleoindian period. This period dates from about 10,000 B.C. to 6,000 B.C. Sites from this period are recognized based on diagnostic dart point types such as Clovis, Plainview, and Angostura. During the Paleoindian period, great expanses of land were inundated by the rising sea levels. The sea levels were increasing due to the melting of glacial masses at the end of the Pleistocene. The final rise in sea level began about 18,000 years ago, with the present coastline being achieved about 3,000 years ago (Brown et al. 1976).

In the greater south Texas and northeast Mexico area, several Paleoindian sites have been reported, and in a few cases excavated. At the Falcon Reservoir, in Starr County, the Evans site on the U.S. side of the Rio Grande yielded an artifact possibly associated with extinct megafauna (Cason 1952). On the Mexican side of the Rio Grande, archaeologists have found flint debitage and an artifact eroding out of a mammoth locality (Krieger n.d.). A Plainview point was found at another Falcon Reservoir site (de la Borbolla and Arroyo de Anda 1953) and excavations by Weir (1956) and Newton (1968) isolated a Paleoindian component at the La Perdida Site, also in Starr County, as identified by Plainview, Meserve, Angostura, Scottsbluff, and Clovis projectile points.

Archaic

As the climate changed and the big game animals died out, there was a transition into the Archaic period. Recognized Archaic dart points in the Anderson collection (see previous Archaeological Investigations) suggested the presence of Archaic peoples in the area. South of the project area, MacNeish (1958) published pertinent information, including a chronology for the Archaic in Tamaulipas, after three seasons of survey and excavation. He considered diagnostic artifacts and geographic distributions in defining three Archaic complexes and phases for northern Tamaulipas. They are, from earliest to latest, the Nogales, Repelo, and Abasolo complexes, and span the period from 5,000 B.C. to A.D. 100. He made comparisons to Archaic materials from the Falcon Reservoir where the Archaic Falcon focus was defined with an estimated temporal span of approximately 5,000 B.C. to A.D. 500 or 1,000 (Suhm et al. 1954).

Following the Archaic, the Late Prehistoric period, termed Neo-American by Suhm et al. (1954), is the last prehistoric period in the Rio Grande Archeological Region. This period is marked by the presence of arrow points in the artifact inventory. Although, in many areas of Texas, ceramics appear on archaeological sites during this stage, ceramics are relatively scarce in the Lower Rio Grande Valley.

Late Prehistoric

The bulk of our knowledge of the archaeology of south Texas is from the Late Prehistoric. MacNeish (1958) has defined two closely related complexes, the Brownsville and Barril, for the Lower Rio Grande delta. Common to both complexes are shell disks, pierced shell disk beads, plugs made from a columella that are round in cross section, rectangular conch shell pendants, mollusc shell scrapers, and Starr, Fresno, and Matamoros projectile points. Intrusive pottery of Huastec origin from southern Tamaulipas appears in occupation sites and in burials (Anderson 1932; Mason 1935; MacNeish 1947).

The first Europeans, the Spanish, encountered indigenous people speaking the Coahuiltecan language in southern Texas and northeastern Mexico (Salinas 1990). The Coahuiltecan language is similar to the Karankawan, which was spoken by coastal peoples north of Corpus Christi up to the west side of Galveston Bay (Swanton 1940). From Corpus Christi, the Coahuiltecan area extended northwestward to San Antonio, westward to just below the point where the Pecos River empties into the Rio Grande, and southward into Nuevo Leon, northeast of Coahuila, northern San Luis, Potosi, northeast Zacatecas, and northern Tamaulipas. Coahuiltecan peoples are linguistically related to the Hokan groups of languages in California (Sapir 1920; Swanton 1940; Ruecking 1955).

Indian sites from the final stage, Historic Indian, are distinguished by the presence of European and non-aboriginal American trade goods that date from the sixteenth through mid-nineteenth centuries. Debris on historic Indian sites indicates a continuing nomadic hunting and gathering existence. The best account of the native people's of Texas comes from the chronicle of Alvar Nunez Cabeza de Vaca, a survivor of a Spanish shipwreck in 1528 (Covey 1972). The names and locations of some historic Coahuiltecan groups are listed in the *Handbook of Texas*, Volume III (Branda 1976). By the 1850s, a combination of European-introduced diseases and tribal wars stimulated by Europeans had decimated the Indians of south Texas (Campbell 1958).

Research has indicated that the Coahuiltecan probably never existed as a single tribe (Hester 1999). Rather groups with similar language were identified by the Spanish as Coahuilteco presumably because the native homeland of many groups was Coahuila, Mexico. There is no extant Coahuiltecan tribe today, however there is a group based in the San Antonio area that calls itself the Tap Pilam-the Coahuiltecan Nation. They are not a federally recognized tribe at this time, but the tribe has filed a petition for recognition by the Secretary of the Interior that the group exists as an Indian tribe (Federal Register 1998).

There are no indigenous tribes extant in the area. Indian tribes that have in the past inhabited this part of Texas include the Comanche, Kiowa, and Lipan Apache. The Comanche and the Kiowa came into south Texas following herds of wild mustangs and bison. The traditional homeland of

the Lipan Apache included the area between the Texas Panhandle and the Hill Country of Central Texas, but there were incursion by the Lipan Apache into south Texas.

Spanish Exploration and Settlement

The Spanish are recognized as the first European nation to claim territory that encompasses the Lower Rio Grande Valley. Alonso Alvarez de Pineada is believed by many to have been the first European to reach the mouth of the river, arriving in 1519 (Scott 1937; Stambaugh and Stambaugh 1954). Pineada, who was commissioned to map and explore the Gulf of Mexico by Francisco de Garay, Governor of Jamaica, discovered a large river with a grove of palm trees at its delta. He subsequently named this waterway Rio de las Palmas. Historians do not agree as to which river Pineada actually discovered. Some maintain that it was the Rio Grande; while others believe it was the Rio Soto la Marina in Tamaulipas, Mexico (Hill 1926). Weddle (1985) supports that latter contention, pointing out that the Rio Soto la Marina was known until the mid-eighteenth century as the Rio de la Palmas, while one of its southern tributaries continues under that name today. Despite the uncertainty surrounding the exact location of Rio de las Palmas, Pineada's efforts spurred further exploration of territory in the region.

In 1520, a year after Pineda's trip, Garay sent an expedition led by Diego de Camargo to colonize the territory. Although unsuccessful because of conflicts with native tribes in the area, this effort demonstrated the strong desire of the Spanish to consolidate their claims to the region. In addition, Camargo is credited with naming the narrow waterway that extends between Brazos and Padre Islands. He called this pass Brazos de San Iago, in honor of Saint James Day. A.A. Champion, a local historian, notes that Iago is the ancient form of Diego which, translated into English, is James. In subsequent years, the name evolved into Brazos Santiago, by which it is known today.

Several other attempts were made by the Spanish to explore and settle the Lower Rio Grande Valley during the sixteenth century, including expeditions led by Gonzalo de Ocampo in 1523, Sancho de Caniello in 1528, and Pedro de Alvarado in 1535; however, no permanent settlements were established (Rogers 1996). After these efforts, Spanish activity was severely curtailed and no serious attempts were made to colonize the Lower Rio Grande Valley until the mid-eighteenth century.

Spanish activity during the intervening 200 years was primarily military in nature, as efforts were made to locate and counter expeditions of, or settlements established by, other European nations. Such intrusions were regarded as direct threats to Spanish sovereignty and, despite an occasional lack of concrete evidence for their existence, were always taken seriously. In 1638, for example, rumors of a Dutch invasion at the mouth of the Rio Grande prompted the Spanish to send Jacinto Garcia de Sepulveda and his men to find these intruders. None, however, were found (Stambaugh and Stambaugh 1954; Ruecking 1955). In 1685, Alonso de Leon led the first of several expeditions assigned to locate Fort Saint Louis which had been established near Lavaca Bay by the Frenchmen Rene Robert Cavalier, Sieure de La Salle. De Leon's search eventually took him throughout the southern Texas coastal areas

and he is believed to have crossed the Arroyo Colorado in mid-Cameron County. De Leon eventually discovered the fort, abandoned (Stambaugh and Stambaugh 1954; Tyler 1996).

By the mid-eighteenth century, Spanish authorities demonstrated renewed interest in settling land that included the Lower Rio Grande valley, as well as much of modern day south Texas and northern Mexico. Although Spain had retained control of this territory, which was known as Nuevo Santander for more than 200 years, very little was known about its land, resources, and vegetation. Plans were made to inspect the region between Tampico and the San Antonio River and, on September 3, 1746, Jose de Escandon was made lieutenant of the viceroy of New Mexico and conquistador and governor of the province of Nuevo Santander. This appointment marked the beginning of Escandon's 23-year commitment to the colonization of these lands and proved to be a turning point in the development of the Lower Rio Grande Valley. In 1747, Escandon dispatched four expeditions to the region and personally led one that took him and his party to the Rio Grande and nearby environs. Captain Joaquin de Orobio Bazterra, commander at Presidio La Bahia del Espiritu Santo, led another expedition that explored territory between the Nueces River and the Rio Grande. These and the other parties met near the mouth of the river (Hill 1926).

With the knowledge acquired from these expeditions, Escandon instigated a colonization policy that resulted in the establishment of 23 settlements. Departing from traditional Spanish practice which relied heavily upon a strong military presence, towns founded by Escandon were, therefore, dependent primarily upon civil defenses. None of his settlements were located in the project area.

In the second half of the eighteenth century, organized settlement began to expand toward the Gulf of Mexico. In 1765, San Juan de los Esteros, a small ranching village populated by residents of Reynosa, was established about 22 miles (35 kilometers) from the mouth of the river. Initially, the settlement struggled to survive, but in 1795, a large influx of colonists from Nuevo Leon assured its prosperity. A year later it was renamed Nuestra Senora del Refugio, following Mexican independence from Spain, its name was changed again, this time to Matamoros in honor of a Mexican revolutionary war hero. Fronzon, a small fishing village, was established in the 1770s on a site that eventually became Port Isabel (Tyler 1996).

Mexican Period and an Independent Texas

Mexican independence from Spain in 1821 contributed to the development of the Lower Rio Grande Valley. In the early nineteenth century the first land grant issued in the region was awarded by the newly created state of Tamaulipas (formerly Nueva Santander) to Jose Salvador de la Garza. As Spain's claim to the area yielded to the Mexican Revolution in 1821, settlement in the area was sparse but focused into a few key port towns along the Rio Grande. Mexico, like Spain, continued to encourage immigration and settlement in the lower Rio Grande, especially along the navigable stretch of the river between the Gulf and Roma in Starr County. Most of the Mexican landowners were isolated ranchers.

However, as trade increased and Matamoros grew into an active port, many Americans and Europeans came seeking economic opportunities. Unlike the Mexicans, however, these individuals were, for the most part, merchants (Graf 1942). Charles Stillman, a native of Connecticut, was one such individual and he later became a dominant force in the economic development of the region. He settled in Matamoros in February 1828 and, along with his father, operated a profitable mercantile business. He later joined forces with Mifflin Kenedy and Richard King in a steamship operation that transported goods from the mouth of the Rio Grande to Matamoros during the mid-nineteenth century.

Perhaps the most significant development during this period was the establishment of a sea port in the Lower Rio Grande Valley in 1823. Prior to this, Vera Cruz had served as Spain's sole open port in Mexico which made the transporting of goods to more remote areas in the colony difficult, expensive, and time consuming. With the opening of a port in Matamoros, however, trade with the rich hinterlands of northern Mexico was more accessible. Martin de Leon, who later founded the town of Victoria, Texas, initiated commercial shipping to the Rio Grande region when he chartered a schooner in New Orleans that sailed to Brazos Santiago. From there, the goods were transported overland to Matamoros for distribution.

Another important event of the era was the inauguration of steamship service along the river. Henry Austin, a cousin of Stephen F. Austin, arrived with his steamer Ariel from New York on June 29, 1829. Despite Austin's grand intentions, the operation of the steamboat was not profitable. The difficulty of navigation on the river and the lack of cooperation and participation among Mexican merchants were prime factors for its abandonment in September 1830. Austin then took the vessel to the Brazos River (Graf 1942). Although its impact on commercial trade was hardly noticeable, the arrival of Austin's steamboat ushered in an era that gained considerable significance in subsequent decades.

Texas' struggle for independence, for the most part, bypassed the Lower Rio Grande Valley, as most military and political events took place further north. Following the conclusion of the war, 4,000 soldiers of Santa Anna's defeated army converged on Matamoros and depleted much of the available food supplies. Commerce and trade in the town and nearby areas diminished with this sudden influx, but its effects were only temporary. Soon, the economy rebounded and residents went on about their business (Thompson 1965).

After the Republic of Texas was officially formed and was truly independent of Mexico, both countries claimed territory between the Rio Grande and Nueces River. The inability of each government to control effectively or exert much influence in this area left many residents vulnerable to attack by Indians and roaming bands of soldiers of both countries. Another event that increased tensions occurred in 1839 when Francisco Viaduarri and others declared that a new nation, the Republic of the Rio Grande, was being formed from the Mexican states of Nuevo Leon, Chihuahua, Coahuila, and

Tamaulipas, including the Lower Rio Grande Valley of Texas. Unlike the Texas war for independence, this rebellion was successfully quelled by Mexican forces (Tyler 1996).

The Mexican War

Disputes between Mexico and the United States erupted into full-scale warfare over the location of the boundary between the two countries. The United States recognized the Rio Grande as the sole boundary, while Mexico recognized the Rio Grande only to the headwaters of the Nueces River and from that point following the Nueces to its mouth near Corpus Christi. Present day Hidalgo County was part of the disputed territory during the Mexican War. The dispute reached an impasse and President James Polk, in an effort to reinforce the American position, ordered General Zachary Taylor's army to the disputed area. Taylor's infantry, artillery, and support units arrived in Corpus Christi via steamer from New Orleans, while his dragoons traveled overland from San Antonio. Personnel from his army surveyed the area across from Matamoros, selecting a site for the army's encampment.

Taylor's army arrived at the Rio Grande following a brief skirmish with Mexican irregulars at Arroyo Colorado. Taylor immediately began receiving dispatches from the Mexican commander General Mejia ordering the Americans to withdraw from the Rio Grande. When Taylor refused, the Mexican army placed artillery along the riverbank south of the fort. Taylor responded by placing his own heavy artillery in position to fire on Matamoros and ordered his chief engineer, Captain Joseph K.F. Mansfield to construct defensive works. Mansfield constructed a six-sided earthen bastion, 800 yards (731.5 m) in circumference, with walls 8.5–9 feet (2.6–2.7 m) in height and surrounded by a ditch 20 feet wide (20.1 m) and 9–10 feet (2.7–3.3 m) deep. The fort's earthen ramparts were topped by wood and mud parapets and the bastions were protected by sandbag merlons between gun embrasures (Mahr-Yanez and Perttula 1995). Before the fort could be completed, Taylor was informed by Captain Walker of the Texas Rangers that Mexican General Arista, now commanding the Mexican forces, had crossed the Rio Grande downstream from the American army and was marching towards the American base at Port Isabel. Taylor, in a night march, beat the Mexican army to Port Isabel and secured his supply line. In his absence, he left Major Jacob Brown in command of the newly constructed fort, along with the 7th U.S. Infantry.

On May 3 the Mexican artillery opened fire on the fort. Major Brown responded with his artillery, destroying one Mexican gun and forcing the Mexicans to reposition the others. The Mexican infantry next attacked, but were repulsed. In an artillery bombardment on May 6, Major Brown received a mortal wound, dying on the afternoon of May 9.

After securing his supply base at Port Isabel, General Taylor returned to relieve the fort's defenders. On the return march his forces encountered those of General Arista at Palo Alto and Resaca de la Palma and inflicted severe casualties and forcing the Mexican army to retreat. Upon learning of Major Brown's death, Taylor ordered the fort named after him and pursued the Mexican army into Matamoros.

All subsequent fighting took place within Mexico, thus, the battles at Palo Alto and Resaca de la Palma were the only ones north of the Rio Grande. Hostilities ceased with the signing of the Treaty of Hidalgo on July 4, 1848. Provisions of this agreement established the Rio Grande as the boundary between the two countries, but also recognized land titles issued by the Spanish and Mexican governments. All public lands, however, were granted to the State of Texas (Thompson 1965).

At the conclusion of the war with Mexico, counties were formed throughout southern Texas. In 1852 Hidalgo County was formed and named for Miguel Hidalgo y Costilla a Mexican patriot. At that time there about 45 ranches in the county many of which eventually became villages due to the parceling of land from one generation to another (Tyler 1996). Small communities such as La Habitación, Relampago, and Penitas had their origins in these ranches. In 1852 La Habitación was renamed Edingburgh and made the county seat. The primary economic endeavors of many of the villagers were transportation, agriculture, and trade with Mexico.

The Rise of the Agricultural and Tourist Industries

Throughout the latter nineteenth century and into the early twentieth century lower Rio Grande Valley agriculture was focused around livestock ranching with crop production limited to a subsistence level. Ranches were distributed up and down the river within the large “porciones” each of which had river frontage and large areas of native pasture. Many of the cattle raised in the region were shipped by boat from small local port towns to larger market centers in Mexico and the United States.

Agriculture and the economy of the lower Rio Grande dramatically diversified during the early years of the twentieth century. With the arrival of rail transportation, it suddenly became possible to bring in large-scale pumping equipment needed to irrigate large tracts of fertile land adjacent to the river. The Louisiana-Rio Grande (LRG) Canal Company Irrigation System is a landmark example of this major change in agricultural technology. Constructed in 1909 by H.N. Pharr, J.D. Kelly, John C. Conway, and A.W. Roth, the LRG Canal Company supplied water from the Rio Grande to arid land that was converted from pasture to cultivated cropland and citrus farms. The company built two pumping stations and an elaborate irrigation system which was highly successful. The company integrated into Hidalgo County’s Irrigation District No. 2, located outside of the project area. As irrigated water became available to the rich and fertile delta region, agricultural production increased dramatically. The citrus industry was started in 1907 when W.A. Fitch planted a commercial scale grapefruit orchard near Mercedes.

The tourist industry has become a dominant force in the local economy in recent years although its early development can be traced to the 1920s. Natural and historical resources within the area have provided a focus for this aspect of the local economy. Historical places like Chimney Park near the project area (Figure 1) have been redeveloped to accommodate the seasonal influx of winter tourist from northern states. Similarly, the establishments of natural parks, like Bentsen-Rio Grande Valley State Park, have served to expand this aspect of the area economy. This trend toward natural and heritage

tourism is being encouraged through studies sponsored by local environmental consortiums (Consortium of the Rio Grande 1997) and the THC (Sanchez et al. 1991), both of which have surveyed the lower Rio Grande Valley and made recommendations regarding resources that are naturally and culturally important.

PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS

The earliest and most extensive work in the south Texas area is that of A.E. Anderson. From 1908 to 1940, Anderson collected and kept records on data from the south Rio Grande Valley and adjacent part of Tamaulipas, Mexico. In 1932, he published a brief description of his artifacts from the Brownsville area (Anderson 1932). Many professional archaeologists have relied heavily on the Anderson Collection as a supplement to their own survey data in making interregional comparisons and in establishing chronological schemes (Sayles 1935; Jackson 1940; Campbell 1947; MacNeish 1947, 1958; Prewitt 1974).

Anderson identified general topographic settings for prehistoric sites. Prewitt (1974) concluded that there were five distinct settings where sites were most frequently located. These are alluvial terraces adjacent to streams or rivers; broad upland areas that are often remnants of Pleistocene alluvial terraces; clay dunes, particularly where these face lagunas and inland lakes; on resacas; and on the barrier islands. Building upon these previous investigations, Mallouf et al. (1977) developed a predictive model which facilitated the location of sites through survey (Day 1981; Day et al. 1981; Etchieson and Boyd 1982; Mercado-Allinger 1983; Hall et al. 1987; Quigg et al. 1989). In all, 175 prehistoric/historic sites were located along drainage ditch alignments in Hidalgo and Willacy counties using these models (Bouseman et al. 1990).

Additionally, Mallouf et al. (1977) cited eolian depressions or playas as major water sources that attracted wildlife and vegetation, and therefore, sites. Some sites were located on more elevated areas, supposedly, to take advantage of several playas (Bouseman et al. 1990). The types of prehistoric sites encountered in south Texas include open sites, burned rock middens, shell middens, clay dune sites, lithic sites, rockshelter sites, and special use sites such as isolated burials, cemeteries, rock art sites, caches, and structures (Black 1989). Historic site types include archaeological remains and architectural components from shipwrecks, industrial buildings, opera houses, schools, forts, courthouses, and other civic buildings, hotels, bridges, post offices, stores, ranches, and houses.

Espey, Huston and Associates, Inc. (EH&A) (now PBS&J) conducted several archaeological investigations in Hidalgo County. These include the survey of a transmission line corridor for the Magic Valley Electric Cooperative (EH&A 1983) and the archaeological assessment of the Central Power and Light Company's Cross Valley Tie transmission line (EH&A 1992). EH&A archaeologists also conducted archaeological investigations in Hidalgo County for Central Power and Light Company's transmission line relocation in the Cimarron Subdivision and for Central and South West Services'

Mexico Tie Transmission Line Project (EH&A 1994) and for a cultural resources survey for a previous Sharyland transmission line project (Schmidt 1998).

Other major archaeological investigations in Hidalgo County include the Hidalgo-Willacy Drainage Ditch Survey (Prewitt and Day 1981; Prewitt and Mercado-Allinger 1983; Prewitt 1986; Hall et al. 1987; Quigg et al. 1989; Bouseman et al. 1990) and the survey conducted for the Hidalgo County Irrigation District No. 16 (Etchieson and Boyd 1982). Archaeological work has been conducted at the Bentsen-Rio Grande Valley State Park (Hartmann et al. 1995), for the Mission Industrial Site Infrastructure Project (Houk et al. 1995), and for the Colonias Wastewater Treatment Assistance Program Project (Jones et al. 1995). A cultural resources survey was also completed for the Texas Department of Criminal Justice, Edinburg Facility (Rader and Leach-Palm 1995). Archaeological and geomorphological investigations and historic research have been conducted for the Pharr-Reynosa International Bridge (Boyd et al. 1994) and for the Anzalduas International Crossing (Keller 1995).

Investigations in other parts of south Texas include the excavation of a large Archaic cemetery named Loma Sandia, 41LK28, in Live Oak County. Dart points, stone pipes, shell ornaments, and deer antlers are among the grave goods found with some of these burials (Taylor and Highley 1995). At Choke Canyon Reservoir, testing and excavation of many Archaic and Late Prehistoric sites revealed buried Archaic occupations with dates of 2,400 B.C. and 3,300 B.C., and provided the initial data on the Archaic of interior south Texas (Hester 1980).

RESULTS OF THE LITERATURE/RECORDS REVIEW

The records review and literature search for the Sharyland Utilities Project in Hidalgo County were conducted at the Texas Archeological Research Laboratory (TARL) and at the THC. The files at TARL were used to identify previously recorded archaeological sites near the project area. The files at the THC were used to learn if any sites listed on or determined eligible for listing on the National Register of Historic Places (NRHP) are within or near the ROW. The THC files were also used to identify State Archeological Landmark (SAL) and State Historical Markers in the vicinity of the study area.

The records at TARL identified over 176 archaeological sites in Hidalgo County, none of which are located in the ROW. The THC files identified 15 NRHP listed properties three of which are historic districts. The La Lomita Historic District is nearby the ROW to the south (see Figure 1). The THC's Texas Historic Sites Atlas website also identifies official state historical markers for the "Spiderweb Railroad" and Juan Davis Bradburn (see Figure 1). One branch of the original early twentieth century "Spiderweb Railroad" still runs through the ROW, although it is now owned and operated by the Southern Pacific railway system. Juan Davis Bradburn was an Anglo military officer who was a leader of Mexican troops in Mexico's early nineteenth revolution against Spain. His subject marker reports that his burial location is unknown, but may be on the nearby hill called La Lomita.

The registered boundary of the La Lomita historic district encompassed 122 acres (49.4 hectares) of a much larger ranch given to the missionary Oblate Fathers by Rene Guyard, a native of France who acquired the La Lomita porcione in 1851 (Sanchez et al. 1991). The Oblate Fathers constructed a simple chapel in 1865 that was destroyed by flooding and replaced by a second small chapel constructed in 1899 and restored in 1949. Two other significant historic structures on the property include a two-story frame convent and St. Peter's Novitiate, a grand Mission style structure surmounting the landmark hill for which the original La Lomita ranch was named. Both of these were constructed in 1912, and have since been integrated into a redeveloped teaching complex with multiple bunkhouses, classrooms and offices. Plans to build greenhouses and cultivate land for row crops were not completed and the hilltop today is densely covered with trees and dense vegetation. Since 1975, when the district was nominated for National Register listing, portions of the registered site boundary have been subdivided, consequently disconnecting the old La Lomita Chapel, now operated as a county park, from St. Peter's Novitiate and the hilltop for which it is named. The La Lomita Chapel and St. Peter's Novitiate are both marked with official state historical markers (see Figure 1).

In addition the recorded sites identified above, the THC's heritage tourism assessment of the lower Rio Grande Valley (Sanchez et al. 1991) identifies the Hidalgo Irrigation Pump Plant, Chimney Park, and El Granjeno Cemetery as important visible remnants of the early twentieth century rise of industry and irrigation agriculture and the influence those developments had on the many small river communities. None are in the ROW. Notably, the lower Rio Grande River itself has been nominated as an American Heritage River for its combination of natural and cultural resources that represent the long history of the area.

The project area, like much of the lower Rio Grande Valley, has undergone, and continues to undergo, dramatic urban and suburban expansion. Only in rare instances do historic sites, like Rancho Toluca near Progreso, survive sufficiently intact to represent the valley's Spanish ranching heritage. Similarly, historic sites representing the missionary heritage are exceedingly rare in the rapidly modernizing environment of the lower Rio Grande Valley. Among the few surviving missions are La Lomita Chapel (1899/1949) and St Peter's Novitiate (1912), both of which have undergone dramatic setting changes and are now cut-off from each other by modern road and levee systems (see Figure 1). These missions are increasingly surrounded by dense residential subdivisions that occupy the mission's former expanse of ranch land.

III. FIELD RESULTS

An interview between PBS&J archaeologists and Dr. David O. Brown, an archaeologist currently working in the Mission/McAllen area, suggested that areas within the Rio Grande's flood plain have a high probability of containing deeply buried archaeological sites. Although the eastern portion of the project does not appear to contain ancient river channel formations locally called "resacas," the river's natural flood plain once extended well beyond the current IBWC flood control levee. Subsequent consultation between PBS&J archaeologists and Bill Martin, of the THC, confirmed Dr. Brown's analysis and determined that the eastern portion of the proposed ROW was also thought to have a moderate to high probability for containing archaeological sites, although most likely in surficial or shallowly buried contexts potentially accessible through shovel testing. Based on this archaeological probability information and the potential for project-related impacts to cultural resources, intensive archaeological survey was recommended by PBS&J for the entire ROW.

ARCHAEOLOGICAL SURVEY METHODS

Archaeological fieldwork was conducted on October 20, 2003, by Dr. Boyd Dixon and Laura Acuna, PBS&J archaeologists, in accordance with the Archaeological Survey Standards for Texas provided by the THC for properties of 200 acres (80.9 hectares) or less. This phase of investigation was conducted to locate shallow prehistoric and historic remains along the ROW. Information was also gathered to assess the possible need for further investigation of more deeply buried remains at support pole locations. Shovel testing at approximate 100 feet (30 m) intervals was conducted within 1,000 feet (300 m) of the river where possible, up to the west side of West Military Highway (Figure 1). East of West Military Highway, the pedestrian survey was conducted without shovel testing due to the disturbed nature of the ROW as it follows the edge of the Edinburg Canal and an adjacent drainage ditch.

ARCHAEOLOGICAL SURVEY RESULTS

Four shovel test units (ST1–ST4), measuring approximately 35 centimeters (cm) (1 foot) in diameter, were placed at 90 feet (30 m) intervals between the edge of the Rio Grande and the Pole #1 location. Two shovel tests (ST5–ST6) were then placed east of a north-south oriented canal, along the south side of the Edinburg Canal and below its associated berm. This area located west of the Union Pacific Railway track and West Military Highway is covered in dense vegetation and was still muddy from recent rains, so only an 250 feet (80 m) interval between shovel tests was possible. The total distance spanned between the six shovel tests was approximately 1,000 feet (300 m). No prehistoric or historic period cultural remains were encountered in the six shovel tests. Their stratigraphic information is recorded in Table 1.

TABLE 1

PBS&J Shovel Tests Conducted on Sharyland-Mexico Tie Project

ST Number	Location	Centimeters Below Surface (cmbs)	Content	Description
ST1	90 m south of Pole 1	0–30 cmbs	None	Medium brown clay silt loam with gravel lense
		30–70 cmbs	None	Light brown silty loam
ST2	60 m south of Pole 1	0–70 cmbs	Twentieth century refuse	Light gray sandy silt
ST3	30 m south of Pole 1	0–60 cmbs	Land snails	Light gray sandy silt
ST4	1 m south of Pole 1	0–60 cmbs	Land snails	Gray brown loamy clay
ST5	1 m north of Pole 2	0–50 cmbs	None	Gray brown silty sand loam
		50–60 cmbs	None	Dark brown silty A-horizon
ST6	80 m north of Pole 2	0–10 cmbs	Twentieth century refuse	Gray brown sandy silt
		10–20 cmbs		Dark brown silty A-horizon
		20–40 cmbs	None	Gray silty clay at water table

Pedestrian survey of the proposed ROW was resumed east of West Military Highway, along a low berm formed from the excavation of a drainage ditch that separates the Edinburg Canal from agricultural fields and forest to the south. Shovel testing was infeasible due to the degree of modification associated with the construction of the old Edinburg Canal, the adjacent drainage ditch with their associated berms (see Figure 4b). Fragments of a small brick wall with concrete mortar were encountered lying on their side, near the west end of the ditch berm during survey (see Figure 1). Its provenience on top of the berm indicates it was not in primary context and was likely redeposited during drainage ditch construction or maintenance.

Fragments of twentieth century bricks, concrete pipe, bottle glass, whiteware ceramics, and three chert flakes were also noted outside the ROW within the plowed field. It seems likely that all these artifacts were redeposited during erosion of the low berm fill after ditch construction. Since the materials are outside of the ROW and no evidence for a site was found in the ROW, no site number was assigned.

IV. INTERPRETIVE DISCUSSION

The following section presents an interpretive overview of the results of archaeological field survey and historic records and literature search, as they pertain to the likelihood of powerline tower construction impacting significant cultural remains.

GEOARCHAEOLOGICAL INTERPRETATIONS

Shovel tests ST1–ST3 appear to have been placed on the T¹ terrace of the river in soils classed as Rio Grande silt loam, “deep, well drained, silty soils on bottom lands” (Jacobs 1981:94). Excavation in ST2 and ST3 encountered metal cans and plastic bags to a depth of 1.5 feet (70 cm), indicating modern redeposition of twentieth century refuse either during flood events or during construction activities related to the berm surrounding the holding pond and pumping station.

Shovel tests ST4–ST6 appear to have been placed on the T² terrace of the river in soils classed as Camargo silt loam, “deep, well drained, silty soils on bottom lands” (Jacobs 1981:80). Excavation of ST4 to a depth of 1.3 feet (60 cm) encountered no evidence of twentieth century disturbance, with a few land snails suggesting some degree of natural soil development. Excavation of ST5 to a depth of 1.3 feet (60 cm) encountered a possible buried silty A-horizon, likely of historic origin and buried by construction fill from the Edinburg Canal berm. Excavation of ST6 to a depth of 1.1 feet (40 cm) encountered the same historic A-horizon buried by construction fill and twentieth century trash, just above the water table.

Pedestrian survey east of the West Military Highway appears to have been restricted to the T³ terrace of the river in soils classed as Reynosa silty clay loam, “deep, well drained, silty soils on ancient stream terraces” (Jacobs 1981:93). No evidence of redeposited bedrock or gravels was noted within the eroded fill of the ditch berm during pedestrian survey of the plowed field next to the ROW.

While no prehistoric cultural remains were encountered in primary undisturbed contexts during shovel testing of the ROW, the potential for deeply buried (and deeply disturbed) remains is highest on the T¹ and T² terraces which are still subject to modern flooding today. Shallow but possibly intact remains are more likely present on the T³ terrace east of West Military Road, as indicated by the few flakes and a flaked cobble noted during visual inspection of the plowed field just south of the ROW.

HISTORICAL INTERPRETATIONS

The project ROW is located within the Joseph Antonio Cantu “porcione,” a long lot survey granted to Cantu ca. 1767 by the Spanish government, and may extend into the adjacent Gabriel Manguilla Survey. While these porciones were most likely used for livestock ranching in a manner typical of Spanish Colonial era land grants fronting on the lower Rio Grande, the likelihood of impacting

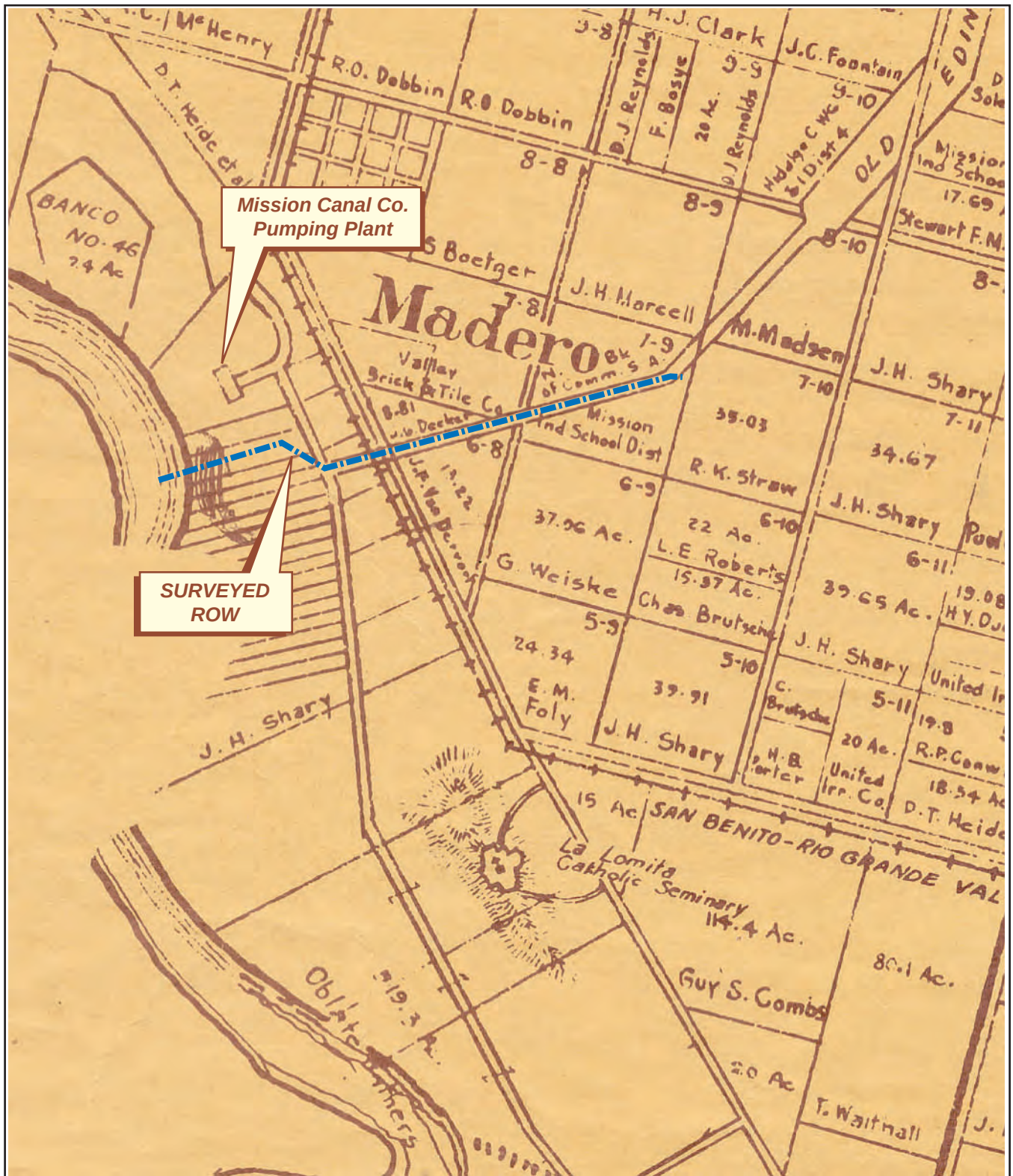
a significant cultural deposit from this era is remote considering the sparse pattern of settlement at that time and the current evidence of landform disturbance noted in the survey. Traditional ranching as the primary land use changed only slightly when Cantu's "Rancho La Lomita" was transferred to the Missionary Oblate Fathers, who founded the La Lomita Mission in the mid-nineteenth century. It seems unlikely that the project will directly or indirectly impact any improvements related to the original La Lomita Chapel site near the river or the more recent St. Peter's Novitiate site (see Figure 1) because both were avoided in the route selection process.

The potential for impacts to historic period sites increases with regard to agricultural and transportation improvements present in the project area. Clearly the proposed project will cross rail transportation and water-pumping facilities that reflect pervasive changes in land use that occurred after the arrival of railroads in the Rio Grande Valley in the early twentieth century. The small railway crossed by the project, originally called the San Benito and Rio Grande Valley Railroad, is one branch of a local area rail system that was developed in the absence of a viable farm to market road network to help local farmers ship produce to nearby markets (Day et al. 1981). While no rail related properties in Hidalgo County are currently NRHP listed, the significance of the "Spiderweb Railway" has been recognized through placement of several official state historical markers located in the county. Furthermore, detailed historical accounting of Rio Grande railroad development has also been published (Allhands 1960).

Similarly, the small pumping plant and associated irrigation canals that occur in the project area are minor components of a vast network of irrigation improvements that are ubiquitous components of the Rio Grande Valley landscape. This aspect of the Rio Grande Valley's heritage has been recognized in various ways, including extensive surveys of the region's heritage tourism resources (Sanchez et al. 1991) and National Register nomination efforts that have recognized the LRG Canal Company Irrigation System located south of the project area and the Mission Pumping Plant located north of the project area. With this aspect of the region's agricultural industrial development so well represented in the National Register it seems unlikely that the pumping plant and irrigation canals within the project area represent resources eligible for National Register listing and detailed Section 106 effect consideration.

A related albeit much altered component of the region's agricultural irrigation development is at nearby Chimney Park (Price 2003), a recreational vehicle park and resort at the location of the former Mission Canal Company Pumping Plant. The historical marker at this site indicates that the massive chimney at this location (see Figure 1) was built in 1907 with brick produced in the adjacent community of Madero. Historical property ownership maps of the area show the plant located directly across the San Benito-Rio Grande Railroad from property owned by the Valley Brick and Tile Company (Figure 5). One corner of the Valley Brick and Tile Company property fronts on the "Old Edinburg Canal Right Of Way," probably because their operations used water drawn from the canal. Waste

materials from the demolished pumping plant and the brick and tile manufacturing facility are likely sources for the scatters of brick noted during the pedestrian archaeological survey.



north

0 400 meters

400 0 400 800 feet



- Engineering
- Environmental Consulting
- Surveying

Figure 5

"UNDATED" HIDALGO COUNTY
PROPERTY MAP

Source: Texas Historical Commission, Office of the State Archaeologist

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V. CONCLUSIONS AND RECOMMENDATIONS

Given the negative results of shovel testing west of West Military Highway, and the degree of landscape modification due to canal and drainage ditch construction east of West Military Highway, it is unlikely that shallow prehistoric deposits remain intact within the proposed ROW. Deeper mechanical testing efforts are not recommended because the amount of excavation required to test the full depth of project-related impacts would cause far greater disturbance to possible cultural deposits than drilling of the actual utility pole locations. Therefore, once the precise locations of utility poles can be determined and staked in the ROW with a high degree of accuracy, monitoring of construction is recommended in the T¹, T², and T³ terraces at Poles #1, #2, and #3, to record any cultural materials displaced from deeply buried contexts.

With regard to twentieth century cultural materials observed as redeposited scatters of brick, glass, ceramics at berms surrounding the pumping plant holding pond and along the old Edinburg Canal, no further archaeological or historical testing is recommended. The need for such research can be assessed based on the potential information yield presented by any historic period cultural deposits observed during the recommended construction monitoring program. In the event that human skeletal remains are encountered, construction in the vicinity should be stopped and the THC notified to determine the proper treatment of the remains.

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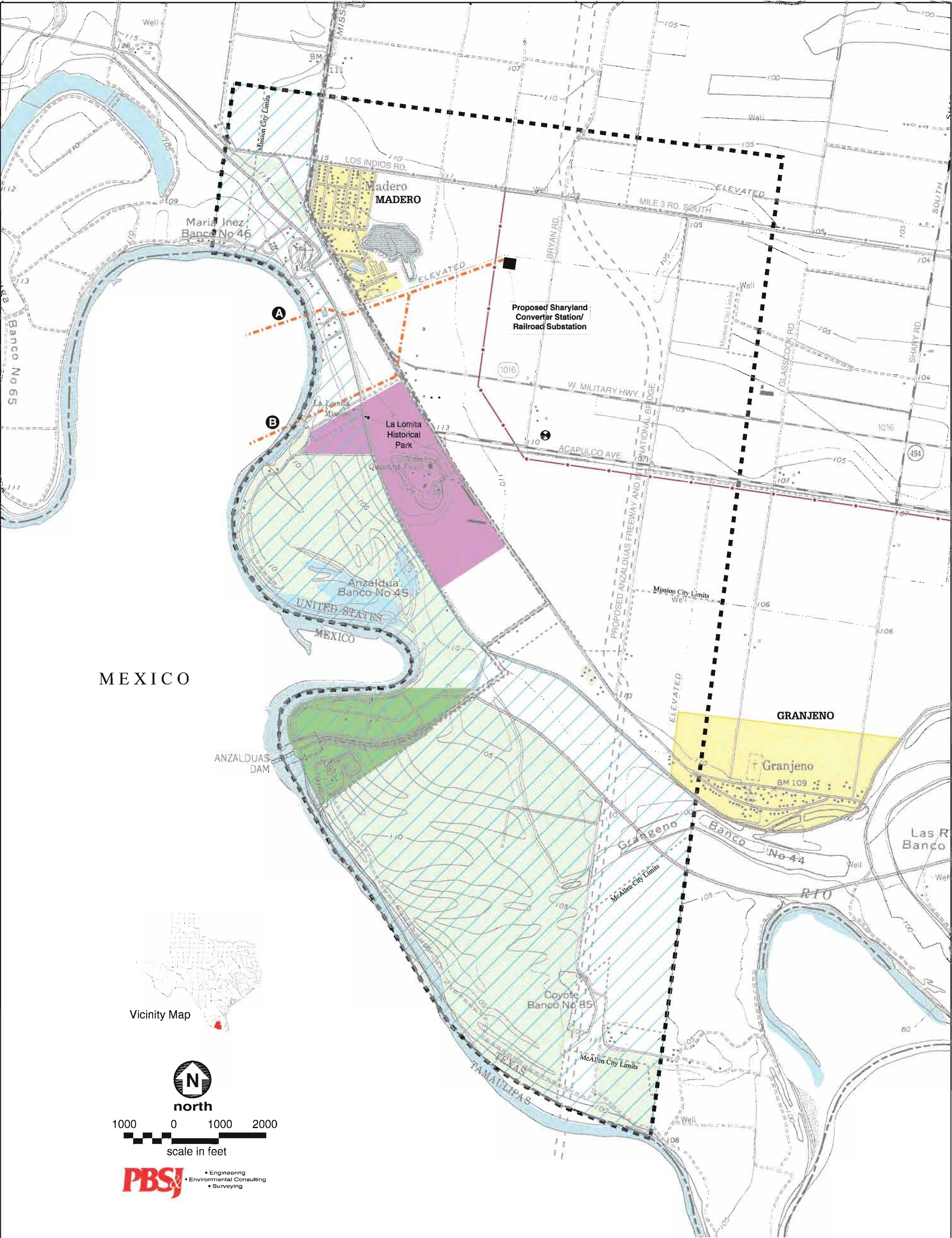
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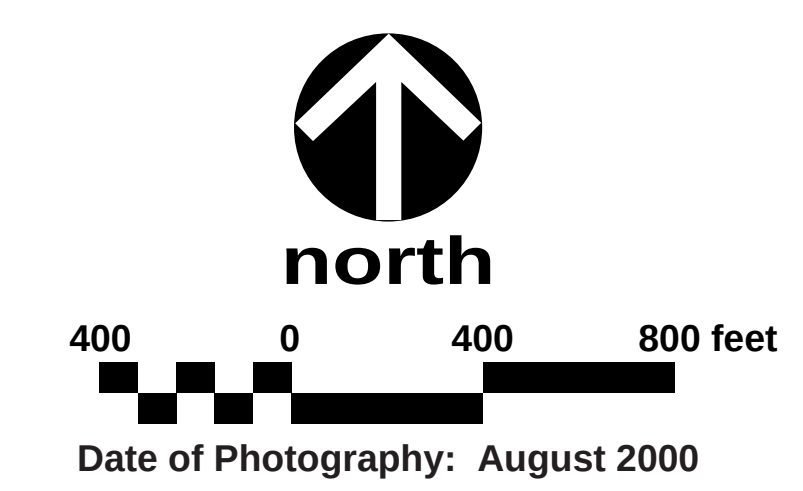
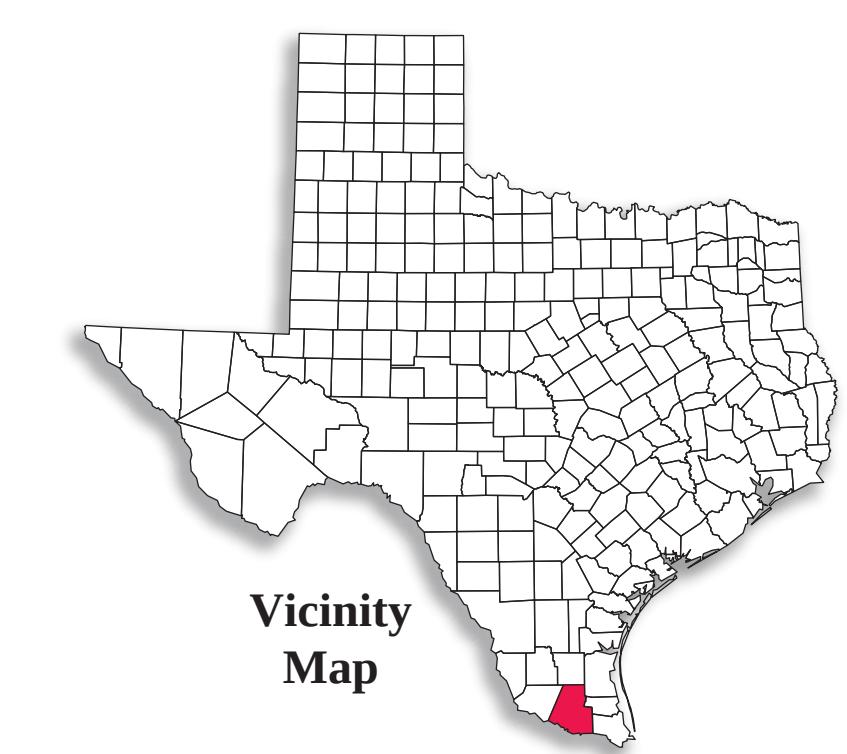
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|---|--|
| ■ ■ ■ ■ Study Area Boundary | 100-Year Floodplain |
| --- City Limits | La Lomita National Register Historic District |
| • Existing 69-kV Transmission Line | City/Community |
| • Approved Sharyland Utilities 138-kV Transmission Line | Anzalduas County Park |
| --- Alternative Route | Lower Rio Grande Valley National Wildlife Refuge |
| ⊙ Electronic Communications Tower | Wetlands from National Wetland Inventory |

Figure 2-3
Primary Alternative Routes and
Environmental/Land Use Constraints

SHARYLAND - DC MEXICO TIE PROJECT



- Applicant's Preferred Alternative (Route A)
- Alternate Route (Route B)
- Existing 69-kV Transmission Line
- Approved Sharyland Utilities 138-kV Transmission Line



PBS • Engineering
• Environmental Consulting
• Surveying

Figure 2-4
APPLICANT'S PREFERRED ALTERNATIVE (ROUTE A) AND ALTERNATE (ROUTE B)
SHARYLAND - DC MEXICO TIE PROJECT
Revised: 03/01/04