

Draft Environmental Assessment

City of El Campo
Tres Palacios Creek Drainage
Improvements Project
SRL / 06-TX-2011-008

Wharton County, Texas

October 2012



FEMA

Federal Emergency Management Agency
Department of Homeland Security
500 C Street, SW
Washington, DC 20472

TABLE OF CONTENTS

1.0	INTRODUCTION.....	1
2.0	PURPOSE AND NEED.....	1
2.1	Purpose.....	1
2.2	Need.....	1
3.0	ALTERNATIVES.....	2
3.1	No Action Alternative.....	2
3.2	Proposed Action.....	2
3.3	Other Action Alternatives	3
3.4	Alternatives Considered and Dismissed	3
4.0	AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS.....	5
4.1	Physical Resources.....	5
4.1.1	Geology and Soils	5
4.1.2	Air Quality.....	7
4.2	Water Resources.....	7
4.2.1	Groundwater.....	7
4.2.2	Floodplains	8
4.2.3	Water Quality.....	10
4.2.4	Surface Waters.....	11
4.2.5	Wetlands	14
4.3	Biological Resources.....	16
4.3.1	Wildlife Habitat	16
4.3.2	Protected Species	18
4.4	Cultural Resources	23
4.5	Socioeconomic Resources.....	25
4.5.1	Environmental Justice	25
4.5.2	Hazardous Materials	27
4.5.3	Noise	29
4.5.4	Transportation	30
4.5.5	Public Health and Safety.....	31
4.5	Environmental Summary Table.....	31
5.0	CUMULATIVE IMPACTS	37
6.0	AGENCY COORDINATION.....	38
7.0	PUBLIC INVOLVEMENT.....	39
8.0	LIST OF PREPARERS.....	40

LIST OF TABLES

Table 1. Flood Reduction Alternative Descriptions from the 2010 Tres Palacios Watershed Flood Protection Planning Study 4

Table 2. Soil Units within the Study Area 6

Table 3. Summary of Drainage Features within the Study Area 12

Table 4. Summary of Delineated Wetlands within the Study Area 15

Table 5. Federal and State Protected Species in Wharton County and Summary of Potential Impacts..... 19

Table 6. Minority and Low Income Populations within the Study Area and Surrounding Areas 26

Table 7: Hazardous Materials Database Review Summary 28

Table 8. Summary of Impacts and Mitigation Measures 32

Table 9. Summary of Agency Coordination 38

LIST OF FIGURES

- Figure 1.** Project Location Map
- Figure 2.** Cross Section of the Proposed Project
- Figure 3.** Study Area Map
- Figure 4.** USGS Topographic and FEMA Floodplain Map
- Figure 5.** Mapped Features of the Proposed Area

LIST OF APPENDICES

- Appendix A:** Photographs of the Project Area
- Appendix B:** 30% Preliminary Design – To Support the Environmental Assessment
- Appendix C:** Tres Palacios Watershed Flood Protection Planning Study Final Report
- Appendix D:** Jurisdictional Determination of Waters of the United States and Supplemental Documentation
- Appendix E:** Agency Coordination
- Appendix F:** Cultural Resource Survey Report
- Appendix G:** GeoSearch Hazardous Materials Report
- Appendix H:** Public Notice

ACRONYMS and ABBREVIATIONS

ACS	American Community Survey
APE	Area of Potential Effects
BeA	Bernard-Edna complex
B/C	Benefit-to-Cost
BcA	Bernard clay loam
BMP	Best Management Practice
Business 59	United States Route 59 Business
CAA	Clean Air Act
CFR	Code of Federal Regulations
CSN	Construction Site Notice
CR	County Road
dB	decibel
DNL	Day-Night Average Sound Level
EA	Environmental Assessment
EdA	Edna fine sandy loam
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FM	Farm-to-Market
MOE	Margin of Error
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NOI	Notice of Intent
NRCS	National Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
OHWM	Ordinary High Water Mark
OSHA	Occupational Safety and Health Administration

ACRONYMS and ABBREVIATIONS Cont.

SAL	State Archeological Landmarks
SHPO	State Historic Preservation Officer
SRL	Severe Repetitive Loss
SWPPP	Storm Water Pollution Prevention Plan
TCEQ	Texas Commission of Environmental Quality
TCRFC	Texas Colorado River Floodplain Coalition
THC	Texas Historical Commission
TPDES	Texas Pollutant Discharge Elimination System
TPWD	Texas Parks and Wildlife Department
TWDB	Texas Water Development Board
TXNDD	Texas Natural Diversity Database
USACE	United States Army Corps of Engineers
USCB	United States Census Bureau
USDA	United States Department of Agriculture
USDHHS	United States Department of Health and Human Services
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

1.0 INTRODUCTION

The City of El Campo in conjunction with Wharton County has applied for a Severe Repetitive Loss (SRL) Grant (SRL 06-TX-2011-008) through the Federal Emergency Management Agency's (FEMA) Hazardous Mitigation Assistance (HMA) program. The proposed flood mitigation project will increase the flood storage capacity of Tres Palacios Creek within the City of El Campo. The proposed flood mitigation project will significantly reduce future flood damages in El Campo that originate from the Tres Palacios Creek. With the proposed improvements, approximately 608 structures will be removed from the 100-year floodplain.

The City of El Campo is located in Wharton County along the United States Highway 59 (US 59) corridor in southeastern Texas. The project limits include an approximate 13,650-foot long segment of Tres Palacios Creek that extends from United States Route 59 Business (Business 59) near Avenue I within the City of El Campo to County Road (CR) 406 west of US 71, just south of the city limits. The geographic coordinates of the project extend from 29°11'18.13" North Latitude and 96°16'51.03" West Longitude (northern extent) to 29°10'22.42" North Latitude and 96°15'02.95" West Longitude (southern extent). See **Figure 1, Project Location Map** and **Appendix A, Photographs of the Project Area**.

This Environmental Assessment (EA) has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), the President's Council on Environmental Quality regulations to implement NEPA (40 Code of Federal Regulations (CFR) Parts 1500–1508), and FEMA's regulations implementing NEPA (44 CFR Part 10). FEMA is required to consider potential environmental impacts before funding or approving actions and projects. The purpose of the EA is to analyze the potential environmental impacts of the proposed flood mitigation project. FEMA will use the findings in this EA to determine whether to prepare an Environmental Impact Statement or a Finding of No Significant Impact.

2.0 PURPOSE AND NEED

2.1 Purpose

Through the SRL grant program, FEMA provides grants to states and local governments to implement long-term hazard mitigation measures. The SRL program is authorized by Section 1361A of the National Flood Insurance Program (NFIP) (Title 42, United States Code 4102a) with the purpose of reducing flood damages to residential properties that have experienced severe repetitive losses under flood insurance coverage and that will result in the greatest savings to the National Flood Insurance Fund.

2.2 Need

Tres Palacios Creek has been a source of frequent flooding for the citizens of El Campo for a significant length of time. Historic flood hazards within the City of El Campo have been listed in the Texas Colorado River Floodplain Coalition (TCRFC) All Hazards Mitigation Plan Update, and include floods in 1990, 1991, 1994, 1998, 2002, and 2004; all of which received a Disaster Declaration from the President. Most recently, the City of El Campo experienced extensive flood damages due to the Thanksgiving Day flood of 2004 and approximately five hundred homes in Wharton County were damaged during the flood. Sources of flood hazards throughout the area include local stream flooding due to inadequate stream capacity, and restrictions in the channels caused by siltation. As a result of frequent flooding and the potential for increased development in the area, local officials applied for a Texas Water Development Board (TWDB) Flood Protection Planning Grant to aid in the creation of new hydrologic and hydraulic modeling of the river basin, as well as flood damage reduction alternative analyses to aid in planning efforts. The proposed flood mitigation project has been identified as an important project to the community that meets the purpose of the SRL grant program.

3.0 ALTERNATIVES

Two alternatives were evaluated in this EA, the No Action Alternative and the Proposed Action Alternative. This section also summarizes other action alternatives that were considered and dismissed.

3.1 No Action Alternative

The No Action Alternative would not include mitigation measures to reduce flooding to SRL properties. The citizens of the City of El Campo and Wharton County would continue to be vulnerable to flooding and the next flooding event would put hundreds of structures at risk.

3.2 Proposed Action

The Proposed Action Alternative is to widen an approximate 13,650-foot long segment of the Tres Palacios Creek to a 50-year capacity. The 50-year earthen channel would provide significant flood reduction to the local community, with negligible adverse impacts to adjacent properties. A total of 608 structures would be removed from the 100-year floodplain with the proposed action by reducing the 100-year flood elevation by 1 foot. Site visits conducted indicate that the Tres Palacios Creek is a natural, earthen channel. See **Appendix A, Photographs of Project Area**. Vegetation maintenance is evident along the banks of Tres Palacios Creek throughout various portions of the project area.

This alternative consists of increasing the flood storage capacity of Tres Palacios Creek by excavating sediment and grading to 4:1 side slopes. No grading or disturbance will occur within the channel below the ordinary high water mark (OHWM), in order to avoid disturbance to the natural channel. No

improvements to the existing roadway crossings are proposed for this project. An analysis of the benefit-to-cost (B/C) ratio indicated that roadway crossing improvements would not be economically viable. See **Figure 2, Cross Section of the Proposed Project** and **Figure 3, Study Area Map (Sheets 1 – 10)**. **Appendix B** contains the 30 percent preliminary design.

The proposed flood mitigation project will necessitate the acquisition of an easement varying from 60-feet wide to 120-feet wide. The City of El Campo is currently purchasing properties within the project area as they become available; however, no easements have been acquired at this time.

3.3 Other Action Alternatives

For the purpose of this environmental assessment, there are no other Action Alternatives.

3.4 Alternatives Considered and Dismissed

With the assistance of a TWDB Flood Protection Planning Grant, hydrologic and hydraulic modeling was performed on the Tres Palacios Creek from Business 59 to CR 406 (See **Appendix C**). The resulting hydraulic data was then used to analyze various flood reduction structural alternatives for the City of El Campo and Wharton County. Eight El Campo flood reduction alternatives were analyzed during the flood damage reduction analysis and are summarized in **Table 1**. Five of the alternatives are channel improvement projects, one is the No Action Alternative, and two are detention only or detention/diversion options. The damage reduction provided by each alternative over the No Action Alternative was compared to the respective costs using the B/C ratio.

Non-structural flood damage reduction alternatives were assessed in the 2010 Tres Palacios Watershed Flood Protection Planning Study (**Appendix C**) and included buyout of affected houses and raising affected houses. The buyout of affected structures was not advisable because of the cost associated with purchasing hundreds (approximately 647) of affected structures. There were also environmental justice concerns because these homes are predominately in a low-income area. Raising affected structures is inadvisable for similar reasons, especially the extremely high cost of raising hundreds of affected structures. Because of the issues associated with raising or buying out affected homes, the City of El Campo decided to focus on flood mitigation improvements along Tres Palacios Creek.

**Table 1. Flood Reduction Alternative Descriptions from the 2010
Tres Palacios Watershed Flood Protection Planning Study**

Alternative Name	Alternative Description	Reason Dismissed Based on B/C Ratio Assessment
No Action	Without project or existing conditions: reflects current damages without flood reduction measures.	No benefit will occur under the No Action Alternative.
50yr_Earth	50-year capacity channel: Channel improvements to increase channel capacity to hold the 50-year flow extending from Business 59 to CR 406. Channel to remain earthen.	The 50-Year Earthen Alternative is the most economically viable alternative and is not dismissed.
100yr_Earth	100-year capacity channel: Channel improvements to increase channel capacity to hold the 100-year flow extending from Business 59 to CR 406. Channel to remain earthen.	Based on the B/C ratio, the cost of the project outweighs the benefits. The 100-Year Earthen Alternative is not economically viable.
100yr_Conc	100-year capacity channel: Channel improvements to increase channel capacity to hold the 100-year flow extending from Business 59 to CR 406. Channel to be concrete lined.	Based on the B/C ratio, the cost of the project outweighs the benefits. The 100-Year Concrete Alternative is not economically viable.
250yr_Conc	250-year capacity channel: Channel improvements to increase channel capacity to hold the 250-year flow extending from Business 59 to CR 406. Channel to be concrete lined.	Based on the B/C ratio, the cost of the project outweighs the benefits. The 250-Year Concrete Alternative is not economically viable.
500yr_Conc	500-year capacity channel: Channel improvements to increase channel capacity to hold the 500-year flow extending from Business 59 to CR 406. Channel to be concrete lined.	Based on the B/C ratio, the cost of the project outweighs the benefits. The 500-Year Concrete Alternative is not economically viable.
Alt2_Det	Detention Option: Two detention ponds are used to reduce flow downstream of each pond to 10-year flow. Probable locations are on El Campo Tributary somewhere upstream of South Meadow Lane and on the mainstream somewhere upstream of Business 59.	Based on the B/C ratio, the cost of the project outweighs the benefits. Of the 8 alternatives considered, the Detention Alternative has the smallest B/C ratio.
Alt3_Det_Div	Detention/Diversion Option: One detention pond on El Campo Tributary with a probable location somewhere upstream of South Meadow Lane to reduce flow downstream of pond to 10-year flow. Water also to be diverted from El Campo Tributary to Stage Stand Creek through bypass channel.	Based on the B/C ratio, the cost of the project outweighs the benefits. The Detention/Diversion Alternative is not economically viable.

4.0 AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS

This section describes the potential impacts of the Proposed Action Alternative and the No Action Alternative. Where potential impacts exist, conditions or mitigation measures to offset these impacts are detailed. Following this discussion, a summary is provided in **Table 8**.

4.1 Physical Resources

4.1.1 Geology and Soils

According to the Geologic Atlas of Texas, Seguin Sheet (Bureau of Economic Geology, University of Texas at Austin), the proposed flood mitigation project is located within the Pleistocene aged Beaumont Formation on the Interior Coastal Plains. Clayey sand and silt dominate with moderate permeability and drainage, and a low shrink-swell potential. Concretions of calcium carbonate, iron oxide, and iron-manganese oxide are present in weathering zones. Most of the surface is featureless and gently dips toward the Gulf of Mexico. Pleistocene deposits in the county occur from fluctuations of sea level during major advances and retreats of the continental ice sheets (United States Department of Agriculture [USDA], 1974).

Geologic formations and alluvial deposits can roughly be correlated with the soils associations (USDA, 1974) within Wharton County. According to the USDA Natural Resources Conservation Service (NRCS) data, the study area contains soils classified in the Bernard and Edna Soil Series. The Bernard-Edna complex (BeA) consists of deep, nearly level soils in low mounds and in depressions. Runoff is very slow, so artificial drainage and surface smoothing are necessary for water management. The Bernard clay loam, 0 to 1 percent slopes (BcA), is somewhat poorly drained, nearly level to gently sloping, and most commonly located on uplands. The Edna fine sandy loam, 0 to 1 percent slopes (EdA) is on upland areas that are irregular in shape. Like the Bernard-Edna complex, runoff is very slow. A review of the NRCS Wharton County List of Hydric Soils found that all three soil series located within the study area are hydric. Hydric soils form under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper portion of the soil profile.

Table 2. Soil Units within the Study Area

Soil ID	Soil Units	Topography	Drainage Class	Permeability	Available Water Capacity	Runoff
BcA	Bernard clay loam	0 to 1 percent slopes	somewhat poorly drained	very slow	high	-
EdA	Edna fine sandy loam	0 to 1 percent slopes	poorly drained	very slow	high	very slow
BeA	Bernard-Edna complex	0 to 1 percent slopes	poorly drained	very slow	high	very slow

No Action Alternative - Under the No Action Alternative, no construction would occur; therefore, no impacts to geology or soils would occur.

Proposed Action Alternative - Under the Proposed Action Alternative, construction activities would not be deep enough to impact underlying geologic resources. Sediments and soils would be excavated from the Tres Palacios Creek above the OHWM to complete the proposed improvements. In accordance with the Texas Commission of Environmental Quality (TCEQ), a Storm Water Pollution Prevention Plan (SWPPP) must be prepared and a Texas Pollutant Discharge Elimination System (TPDES) permit must be obtained prior to construction and the applicant must comply with all permit conditions. As required under TPDES General Permit, appropriate control measurements (i.e., Best Management Practices [BMPs]) must include:

- Prevention of storm water pollution by controlling erosion and sedimentation;
- Comply with the SWPPP and revise when necessary to control pollution or as required by the engineer;
- Post a Construction Site Notice (CSN) with SWPPP information on or near the site, accessible to the public, TCEQ, Environmental Protection Agency (EPA), or other inspectors; and
- When contractor Project Specific Locations increase to a disturbed soil area of 5 acres or more, submit a Notice of Intent (NOI) to TCEQ and Engineer.

The proposed flood mitigation project is exempt from the Farmland Protection Policy Act because it is located within the El Campo Urbanized Area on the United States Census Bureau (USCB) (USCB 2000) urbanized area maps. Therefore, the land is considered to be previously converted to nonagricultural use (USCB 2011). No agency coordination is required.

4.1.2 Air Quality

The Clean Air Act (CAA) requires that states adopt ambient air quality standards. The standards have been established in order to protect the public from potentially harmful amounts of pollutants. Under the CAA, the EPA establishes primary and secondary air quality standards. Primary air quality standards protect public health, including the health of "*sensitive populations, such as people with asthma, children, and older adults.*" Secondary air quality standards protect public welfare by promoting ecosystem health, preventing decreased visibility, and damage to crops and buildings. The EPA has set National Ambient Air Quality Standards for the following six criteria pollutants: ozone, particulate matter, nitrogen dioxide, carbon monoxide, sulfur dioxide, and lead. According to the EPA, Wharton County, Texas is not classified as a nonattainment area for criteria pollutants (EPA 2011).

No Action Alternative – No impacts to air quality would occur under the No Action Alternative.

Proposed Action Alternative – Under the Proposed Action Alternative, no long term impacts to air quality would occur; however, short-term impacts may occur during construction. As applicable, contractors will be required to water down construction areas to reduce temporary air quality impacts. Emissions will be reduced by keeping idling times down and properly maintaining all fuel burning equipment.

4.2 Water Resources

4.2.1 Groundwater

According to the TWDB *Aquifers of Texas (Report 345)*, the major aquifer underlying Wharton County is the Gulf Coast aquifer. The aquifer consists of complex interbedded clays, silts, sands, and gravels. The Gulf Coast aquifer system is composed of various hydrologic units including the: Catahoula Sandstone, Jasper aquifer, Burkeville confining layer, Evangeline aquifer, and Chicot aquifer. According to the *Ground-Water Resources of Colorado, Lavaca, and Wharton Counties, Texas (Report 270)*, the Evangeline and Chicot aquifers are the main sources of fresh water for Colorado, Lavaca, and Wharton Counties. Less significant sources of water include the Jackson Group, Catahoula Sandstone, and the Jasper aquifer. The Chicot aquifer ranges in total thickness from zero to approximately 1,200 feet in southern Wharton County. The Evangeline aquifer ranges in total thickness from zero to approximately 850 feet in Wharton County. Water in this area is primarily used for irrigation with lesser amounts pumped for municipal supply and industrial use.

No Action Alternative – No impacts to air quality would occur under the No Action Alternative.

Proposed Action Alternative – No impacts to groundwater are expected as a result of the Proposed Action Alternative because construction activities would not be deep enough to impact underlying groundwater resources.

4.2.2 Floodplains

The proposed project is located within the 100-year floodplain.

No Action Alternative – Under the No Action Alternative, the Tres Palacios Creek would continue to be a source of frequent flooding for the citizens of El Campo. Continued flooding would occur from inadequate stream capacity and restrictions in the channels caused by siltation resulting in damage to homes and infrastructure. See **Appendix C** for additional discussion of the No Action Alternative on the local community.

Proposed Action Alternative – Under the Proposed Action Alternative, work within the floodplain would occur. In compliance with FEMA regulations implementing Executive Order 11988, Floodplain Management, FEMA is required to carry out the 8-step decision-making process for actions that are proposed in the floodplain per 44 CFR Section 9.6.

Step 1 of the 8-step decision making process is to determine if the proposed action is located in the base floodplain. The study area is located within the 100-year floodplain, Zone A (1 percent chance flood zone) and floodway as depicted on Preliminary Flood Insurance Rate Map Community Panels 48481C0510E, 48481C520E, and 48481C0550E updated April 5, 2006. See **Figure 4, United States Geological Survey (USGS) Topographic and FEMA Floodplain Map**. The City of El Campo and Wharton County are both participants in the NFIP.

Step 2 is early public notice. Three public meetings were held in the Tres Palacios region. The first meeting was held in El Campo, Texas on December 15, 2009. The second was held in Bay City, Texas on March 23, 2010, and the final meeting was held in El Campo, Texas on April 20, 2010 (**Appendix C**). In addition, additional early notice will be incorporated into the notice of availability for this draft EA.

Step 3 is to identify and evaluate alternatives to locating in the base floodplain. In order to provide flood mitigation for Tres Palacios Creek, the Proposed Action Alternative must include work within the base floodplain. The Proposed Action Alternative includes improving a 13,650-foot long segment of the Tres Palacios Creek to a 50-year capacity. The 50-year earthen channel would provide significant flood reduction to the local community, with negligible adverse impacts to adjacent properties. A total of 608

structures would be removed from the 100-year floodplain with the proposed action by reducing the 100-year flood elevation by 1 foot. This alternative consists of increasing the flood storage capacity of Tres Palacios Creek by excavating sediment and grading to 4:1 side slopes. No grading or disturbance will occur within the channel below the OHWM, in order to avoid disturbance to the natural channel. The project will necessitate the acquisition of an easement varying from 60-feet wide to 120-feet wide. See **Figure 2, Cross Section of the Proposed Project.**

Other flood damage reduction alternatives analyzed in the Tres Palacios Watershed Flood Protection Planning Study Final Report (**Appendix C**) included the buyout of affected houses and the raising affected houses. These alternatives were dismissed because of cost and environmental justice concerns. Therefore, due to the above reasons and to the extent of the floodplain in the project area, there are no practicable alternatives outside of the 100-year floodplain that would meet the purpose and need for the project.

Step 4 is to identify impacts of the proposed action associated with occupancy or modification of the floodplain. The Proposed Action Alternative will increase the flood storage capacity of an approximate 13,650-foot long stream channel segment of Tres Palacios Creek to a 50-year capacity. The 50-year earthen channel alternative would provide significant flood reduction to the local community, with negligible adverse impacts to adjacent properties. A total of 608 structures will be removed from the 100-year floodplain with the construction of the proposed flood mitigation project.

Step 5 is to design or modify the proposed action to minimize threats to life and property and preserve its natural and beneficial floodplain values.

The work will be carried out according to the following conditions:

- No equipment, grading or disturbance will be allowed in the channel below the OHWM with the exception of specifically noted debris and sediment. Such work will be first coordinated with and done while the inspector is on the project.
- No excess excavated material will be deposited in low area or along natural drainage ways.
- No fill will be placed within the 100-year floodplain.
- No material will be stored within the 100-year floodplain.
- Contractor will preserve the existing flowline of the channel and perform grading and fill operations only on slopes and at the toe of slopes as indicated.
- Select compacted fill will consist of Type "B" or "C" backfill (sandy gravel), as specified in the City of El Campo standard specifications. No placement of fill will occur below the OHWM of the channel.

- Where slopes are greater than 4:1, 12 inch rock gabion mattress will be installed. No placement of gabion mattress will occur below the OHWM of the channel.
- Contractor will ensure positive drainage (minimum 2 percent slope) for adjacent properties to the proposed channel improvements.
- Hydro-mulch seeding will be used on disturbed slopes and ground per City of El Campo standard specifications.

In addition, the applicant must coordinate with the local floodplain administrator and obtain required permits prior to initiating work. All coordination pertaining to these activities and applicant compliance with any conditions should be documented and copies forwarded to the state and FEMA for inclusion in the permanent project files.

Step 6 is to re-evaluate the proposed action. The purpose of the project is to reduce the existing flood damages in the City of El Campo. The Proposed Action Alternative is the only practicable alternative to effectively reduce the flood damage with negligible adverse impacts.

Step 7 includes findings and public explanation (final notification). In accordance with 44 CFR Section 9.12, the applicant must prepare and provide a final public notice issued 15 days prior to the start of construction of any final decision where the proposed floodplain or wetland project is the only practicable alternative.

Step 8 includes implementing the action. The implementation and post-implementation phases of the proposed action will be reviewed to ensure that the requirements are fully implemented. The proposed flood mitigation project will be construction in accordance with applicable floodplain development requirements.

4.2.3 Water Quality

The proposed flood mitigation project is located above the OHWM of the Tres Palacios Creek. A review of the USGS quadrangle map for El Campo, Texas 1965 (Photo-revised 1981) illustrates Stage Stand Creek and two unnamed drainage features flowing into the Tres Palacios Creek within the limits of the proposed flood mitigation project.

The condition of the existing Tres Palacios Creek channel with respect to bank stability varies along the length of the project. The bank slopes vary from approximately 2.5:1 to 4:1 mixed with vertical banks at less stable areas. Vegetative ground cover on the channel banks vary from fair to poor, where poorer condition ground cover can be correlated with higher potential soil loss during normal or high stream flow events. This condition is typical of many streams and channels in Wharton County.

A review of the TCEQ 2010 *Texas Integrated Report for Clean Water Act* Sections 305(b) and 303(d) lists two portions of the Tres Palacios Creek as impaired south of the proposed flood mitigation project location in Matagorda County. Segment 1501 occurs approximately 24 miles downstream of the study area with bacteria and depressed dissolved oxygen listed. Segment 24520W occurs approximately 59 miles downstream with bacteria listed as the only impairment.

No Action Alternative – Under the No Action Alternative it would be expected that water quality would remain unchanged, following the historical pattern whereby higher stream flows cause bare, un-vegetated areas of the earth channel to be transported downstream.

Proposed Action Alternative – This project will disturb more than five acres of earth. Under the requirements of Section 402 of the Clean Water Act, the proposed flood mitigation project will meet the requirements of TCEQ TPDES CGP TXR150000 for any sediment discharges that occur during construction. A SWPPP will be implemented and a NOI will be submitted to the TCEQ. The NOI and construction site notice will be posted at the construction site in a conspicuous location. Temporary short-term impacts that generate sediments will be minimized with temporary BMPs during construction. BMP's will include silt fence, inlet protection, stone overflow structures, rock check dam sediment traps, construction entrance/exits, concrete wash outs, debris and trash management and sanitation.

Permanent BMP's that will be constructed as part of the channel improvements include grass embankments for permanent erosion control, stone riprap, concrete riprap and gabion mattresses. No impacts to impaired segments of Tres Palacios Creek are anticipated. It is expected that there will be improvement in the downstream water quality when the permanent grass erosion control is fully established by reducing the volume of sediments transported downstream.

4.2.4 Surface Waters

A review of the USGS 7.5-minute quadrangle map for El Campo, Texas 1965 (photo-revised 1981), illustrates Tres Palacios Creek along with two unnamed drainage features and Stage Stand Creek flowing into Tres Palacios Creek within the limits of the study area. Topography within the study area ranges from approximately 80 to 100 feet above mean sea level. The Tres Palacios Creek watershed is located in the southern portion of Wharton County and drains roughly 261.5 square miles. These waters flow approximately 59.5 miles from the headwaters in El Campo to Tres Palacios Bay. Annual rainfall in the basin ranges from 40 to 47 inches per year. See **Figure 4, USGS Topographic and FEMA Floodplain Map.**

After reviewing relevant background literature, potential stream channels were identified on a map for field verification. Halff Associates, Inc., environmental and engineering consultants, identified the location of different stream segments which would later be compared to a 2006 1-foot LIDAR (Light Detection and Ranging) contour topographic base map. Initial field measurements were placed atop the topographic map and it was concluded that the 1-foot contour topographic map was an accurate representation of the potential stream channels.

Field investigations were conducted when conditions were damp as moderate rain was experienced two days prior to the field visit. The observable characteristics used to field estimate the OHWM for streams varied between segments, but generally included the presence of shelving and/or the destruction of terrestrial vegetation unless otherwise noted. One perennial stream (Tres Palacios Creek), two intermittent streams (Tributary to Tres Palacios Creek and Stage Stand Creek), and four ephemeral streams (ES-1 to ES-4) are located within the study area. Tres Palacios Creek is considered a perennial stream because it flows throughout the year with groundwater as the primary source of stream flow.

Stage Stand Creek and Tributary to Tres Palacios Creek are both intermittent because they flow during certain times of the year when groundwater provides water for stream flow and rainfall provides supplemental water. Four ephemeral stream segments (ES-1 to ES-4) were identified within the study area. ES-1 has steeply cut banks that gradually taper at the confluence with Tres Palacios Creek. See **Appendix D, Jurisdictional Determination of Waters of the United States**.

Water was present at the time of the site visit. ES-2 and ES-3 had little or no water present during the site visit. OHWM determinations were based on matted and bent vegetation; concrete fragments line portions of the channel bottoms. ES-4 cut steeply down bank to Tres Palacios Creek. These segments were classified as ephemeral because the primary hydrologic influence is from surface runoff, without any groundwater influence. **Figure 3 (Sheets 1 – 10)** shows the location of these segments on an aerial map. **Table 3** provides a summary of all mapped tributary segments.

Table 3. Summary of Drainage Features within the Study Area

Feature Name	Figure 3 Sheet #	Stream Classification	Channel Length* (linear feet)	OHWM Width (feet)*	Area (acres)*
Tres Palacios Creek	3-1 to 3-10	Perennial	14,439	15-45	9.94**
Tributary to Tres Palacios Creek	3-1	Intermittent	241	12	0.07
ES-1	3-3	Ephemeral	295	15	0.10
ES-2	3-4	Ephemeral	501	4	0.05
ES-3	3-5	Ephemeral	162	9	0.03
ES-4	3-8	Ephemeral	120	2	0.01
Stage Stand Creek	3-9	Intermittent	204	4	0.02

Table 3. Summary of Drainage Features within the Study Area

Feature Name	Figure 3 Sheet #	Stream Classification	Channel Length* (linear feet)	OHWM Width (feet)*	Area (acres)*
--------------	------------------	-----------------------	-------------------------------	--------------------	---------------

Notes: *Channel Length, OHWM, and Area are calculated within the limits of the study area. Length, Area, and OHWM are approximated by measurements from topographic map and survey data. **Acreage is calculated from an average OHWM of 30 feet. Federal regulations (33 CFR Section 328.3(a)) note that waters of the United States may include

intrastate rivers and streams, including impoundments and other waters. In response to a Supreme Court decision (*Rapanos v. United States*, 547 *Supreme Court* 715 [2006]) addressing the limits of federal jurisdiction, the United States Army Corps of Engineers (USACE) and EPA have issued further guidance, and require additional documentation to support jurisdiction. The USACE continues to assert jurisdiction over traditionally navigable waters and non-navigable tributaries of traditionally navigable waters where the tributaries are relatively permanent waters (i.e., tributaries that typically flow year round or have continuous flow at least seasonally). Navigable waters in the USACE Galveston District are determined on a case-by-case basis. It is assumed for the purpose of this report that Tres Palacios Bay and a portion of Tres Palacios Creek, upstream of Tres Palacios Bay, would be considered traditionally navigable waters. Although the reach of navigability of Tres Palacios Creek upstream of Tres Palacios Bay has not been determined, Tres Palacios Creek within the limits of the study area is a perennial stream. Therefore, Tres Palacios Creek qualifies as relatively permanent water and would be classified as a water of the United States under the new guidance.

No Action Alternative – Under the No Action Alternative, there would be no impacts to waters of the United States.

Proposed Action Alternative – Under the Proposed Action Alternative, the 50-year earthen channel alternative would provide significant flood reduction. The USACE regulates the discharge of dredged or fill material into waters of the United States, including wetlands, pursuant to Section 404 of the Clean Water Act (CWA). Under Section 404 of the CWA, a permit is required from the USACE for any activities involving the discharge of dredged or fill material into waters of United States, including wetlands and tidally influenced waters. An important component of the proposed flood mitigation project is to protect the natural channel below the OHWM, and avoid impacts to wetlands. No grading or disturbance will occur within the channel below the OHWM in order to avoid disturbance to the natural channel. The proposed action will avoid temporary and permanent impacts to waters of the United States. No jurisdictional waters (including wetlands) will be impacted; therefore, a Section 404 permit is not required. Coordination with the USACE is included in **Appendix E**. As noted in the 30 percent design (**Appendix B**), the following commitments have been made:

- No equipment, grading or disturbance shall be allowed in the channel below the OHWM with the exception of specifically noted debris and sediment. Such work shall be first coordinated with and done while the inspector is on the project.
- No excess excavated material shall be deposited in low area or along natural drainage ways.

- No fill shall be placed within the 100-year floodplain.
- No material may be stored within the 100-year floodplain.
- Contractor shall preserve the existing flowline of the channel and perform grading and fill operations only on slopes and at the toe of slopes as indicated.
- Select compacted fill shall consist of Type “B” or “C” backfill (sandy gravel), as specified in the City of El Campo standard specifications. No placement of fill will occur below the OHWM of the channel.
- Where slopes are greater than 4:1, 12 inch rock gabion mattress will be installed. No placement of gabion mattress will occur below the OHWM of the channel.
- Contractor shall ensure positive drainage (minimum 2 percent slope) for adjacent properties to the proposed channel improvements.
- Hydro-mulch seeding will be used on disturbed slopes and ground per City of El Campo standard specifications.

4.2.5 Wetlands

The USACE regulates the discharge of dredged or fill material into waters of the United States, including wetlands, pursuant to Section 404 of the Clean Water Act. Wetlands are identified as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions.

In addition, Executive Order 11990, Protection of Wetlands, directs federal agencies to take actions to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the values of wetlands on federal property. Under Section 404 of the Clean Water Act, a permit is required from the USACE for any activities involving the discharge of dredged or fill material into waters of the United States, including wetlands and tidally influenced waters.

A review of the United States Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) map indicated that there were two NWI mapped wetlands within the study area as depicted in **Figure 3, Sheets 3 and 10** and **Figure 5, Mapped Features of the Study Area**. One of the NWI mapped wetlands is within the limits of construction. The NWI labeled the area as PSS1A (palustrine, scrub-shrub, broad-leave deciduous, temporarily flooded).

A jurisdictional determination for waters of the United States was conducted and the report was submitted to the USACE for review on June 8, 2012 (**Appendix D and Appendix E, Agency Coordination**). As requested by the USACE, additional data points were taken at the mapped NWI wetland to determine the presence or absence of NWI wetlands within the limits of construction. On July 16, 2012, a site visit was

conducted and seven sampling points were taken within and adjacent to the mapped wetland area.

Appendix D - Supplemental Documentation, Sheet 3 represents the limits of the field survey. None of the seven sampling points contained the three wetland parameters. There are no wetlands within the limits of construction. On August 21, 2012, the USACE approved the jurisdictional determination (**Appendix E, Agency Coordination**). A thorough examination of the study area indicated the presence of two wetlands (Wetlands 1 and 2) not depicted on the NWI map. See **Figure 5, Mapped Features of the Study Area**.

Figure 3, Sheet 4 depicts the two wetlands observed within the study area. The following discussion provides a general summary of each of the wetland indicators observed within the sampling points of the two wetlands, based on USACE wetland delineation guidelines. This is followed by a description of specific data collected that were used to define the limits of wetlands. Photographs from each sampling point are provided in **Appendix A** and **Appendix D**. **Appendix D** contains copies of the completed Wetland Determination Data Forms. **Table 4** provides a summary of all mapped wetland areas.

Table 4. Summary of Delineated Wetlands within the Study Area

Feature Name	Figure 3, Sheet #	Wetland Classification	Area (acres)
EW-1	3-4	Emergent	0.05
EW-2	3-4	Emergent	0.02

Vegetation - Similar vegetation was identified within both emergent wetlands. Dominant herbaceous species in EW-1 included crowfoot sedge (*Carex crus-corvi*) and curly dock (*Rumex crispus*). Hackberry (*Celtis laevigata*) dominated the tree stratum with cottonwood (*Populus deltoides*) and green ash (*Fraxinus pennsylvanica*) also present. Herbaceous species found in EW-2 included crowfoot sedge and a small cluster of lilies (*Lilium sp.*). Hackberry dominated the tree stratum with retama (*Parkinsonia aculeata*), huisache (*Acacia farnesiana*), and cottonwood also present.

Hydrology - Surface hydrology indicators observed in mapped wetland areas generally consisted of water marks on the trees and water-stained leaves. Field observation of saturation was present in EW-1; however, no water was seen at EW-2. Along with the primary indicator of water marks and water-stained leaves, geomorphic position and crawfish burrows were also included as secondary indicators for these areas.

Soils - Loamy and clayey soils dominate the study area. Primary indicators of hydric soils were the presence of redox depressions primarily within the upper six inches of the soil profile and redox dark surface within the upper twelve inches. To meet hydric criteria, soils generally had to have a dominant chroma of two or less, or the layer(s) with a dominant chroma of more than 2 must be less than 6 inches thick.

No Action Alternative – Under the No Action Alternative, no impacts to wetlands would occur.

Proposed Action Alternative –Under Section 404 of the CWA, a permit is required from the USACE for any activities involving the discharge of dredged or fill material into waters of the United States, including wetlands and tidally influenced waters. No jurisdictional waters, including the NWI wetlands and the two wetlands identified during the site visit will be impacted; therefore, a Section 404 permit is not required. The applicant shall ensure that best management practices are implemented to prevent erosion and sedimentation to wetlands. This includes equipment storage and staging of construction to prevent erosion and sedimentation to ensure that wetlands are not adversely impacted. Coordination with the USACE is included in **Appendix E**.

4.3 Biological Resources

4.3.1 Wildlife Habitat

According to “*The Vegetation Types of Texas*” (Texas Parks and Wildlife Department (TPWD) 1984), the study area is located within the Crops Region, surrounded by the Pecan-Elm Forest Region. Vegetation in study area is consistent with the vegetation types as described in the TPWD “*The Vegetation Types of Texas*” (1984) and consists of maintained grasses, open-space herbaceous vegetation, upland and bottomland forest, and herbaceous wetlands.

A field visit to assess vegetation within the proposed study area was conducted by environmental scientists on January 12, 2012. See **Appendix A** for photographs of the study area. Vegetation within the study area is comprised of four general vegetation categories: (1) maintained grasses, (2) open-space herbaceous vegetation, (3) upland and bottomland forest, and (4) herbaceous wetlands.

Maintained and open-space herbaceous vegetation consists of herbaceous vegetation dominated by Bermuda grass (*Cynodon dactylon*), johnsongrass (*Sorghum halepense*), Virginia wildrye (*Elymus virginicus*), dallisgrass (*Paspalum dilatatum*), morning glory (*Ipomoea violacea*), frostweed (*Verbesina virginica*), lantana (*Lantana spp.*), dewberry (*Rubus trivialis*), lily (*Lilium spp.*), western ragweed (*Ambrosia psilostachya*), turks cap (*Malvaviscus arboreus var. drummondii*), giant reed (*Arundo donax*), greenbriar (*Smilax bona-nox*), hackberry (*Celtis laevigata*) saplings, and huisache (*Acacia farnesiana*) saplings. Based on field visits and recent aerial photographs, there are eight clusters of upland and bottomland forest with canopy cover at or above 40 percent. The locations of the following tree clusters are shown on **Figure 3** and **Figure 5**.

Tree Clusters 1, 2, and 3 consist of 90 percent tree strata with approximate canopy coverage of 50 percent and 10 percent herbaceous strata. Fifty percent of the cluster is composed of green ash (*Fraxinus pennsylvanica*), 20 percent hackberry, 15 percent live oak (*Quercus virginiana*), and 15 percent black willow (*Salix nigra*). The average diameter at breast height (DBH) is approximately 15 inches, with the range in height from 25 to 50 feet. The understory herbaceous stratum consists of mostly maintained grasses including johnsongrass and Virginia wildrye, with some lilies and western ragweed clumps.

Tree Cluster 4 consists of 75 percent tree strata and 25 percent understory vegetation. Dominate species within the tree strata include: water oak (*Quercus nigra*) with approximately 30 percent, 30 percent live oak, 20 percent hackberry, 10 percent green ash, and an additional 10 percent composed of huisache and Chinese tallow (*Triadica sebifera*). Average DBH is approximately 8 inches. In addition to saplings from the tree strata, Chinese privet (*Ligustrum sinense*) and yaupon (*Ilex vomitoria*) dominated the understory vegetation.

Tree Clusters 5, 6, and 7 consist of 60 percent tree strata and 40 percent understory vegetation. Approximately 50 percent of the tree stratum is hackberry, 25 percent live oak, with the remaining 25 percent made up of American elm (*Ulmus americana*), chinaberry (*Melia azedarach*), black willow, cottonwood (*Populus trichocarpa*), and pecan (*Carya illinoensis*). Average DBH is 8 inches with an average tree height of 25 feet. Understory vegetation is dominated by yaupon, American elm saplings, lilies, curly dock (*Rumex crispus*), and various grasses including johnsongrass.

Tree Cluster 8, consists of a variety of trees with canopy coverage of approximately 40 percent. Hackberry, water oak, and black willow dominate the cluster with approximately 75 percent of the tree strata. The remaining 25 percent consists of Chinese tallow, American elm, bois d'arc (*Maclura pomifera*), and hercules-club (*Zanthoxylum hirsutum*). Understory vegetation was sparse. Dominate herbaceous species included: curly dock, lily, eclipta (*Eclipta prostrata*), johnsongrass, western ragweed, and eastern gramagrass (*Tripsacum dactyloides*). Mustang grape (*Vitis mustangensis*), poison ivy (*Toxicodendron radicans*), and greenbriar were also present.

No Action Alternative – Under the No Action Alternative, no impacts to the vegetation would occur; however, El Campo would continue to be at risk of future flooding events including degradation to terrestrial and aquatic vegetation and associated wildlife habitat.

Proposed Action Alternative - The project will necessitate the acquisition of an easement varying from 60-foot wide to 120-foot wide (**Figure 2** and **Appendix B**). Vegetation will be disturbed during construction. BMPs will be in place to prevent erosion and to re-vegetate disturbed areas. Hydro-mulch seeding will be used per City of El Campo standards. The contractor shall preserve and protect or

remove and replace with prior approval of the affected property owner any trees, shrubs, hedges, etc. in or near the construction area. No long-term impacts to wildlife or associated habitat will result from the Proposed Action Alternative.

4.3.2 Protected Species

There are three protected species listed by the United States Fish and Wildlife Service (USFWS) and 27 protected species listed by the TPWD in Wharton County (**Table 5**). The Whooping crane is federally endangered and the Louisiana black bear is federally threatened, and both are protected under the Endangered Species Act (ESA). The bald eagle occurs in Wharton County; however, the bald eagle has been delisted and is not protected by the ESA. The bald eagle is protected under the Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act. No critical habitat is present in the project area. Scoping letters were sent to USFWS and TPWD during the SRL grant application phase of the project (**Appendix E**). No comments were received from either agency.

Table 5. Federal and State Protected Species in Wharton County and Summary of Potential Impacts

Species	USFWS*	TPWD**	Preferred Habitat	Habitat Present	Habitat Impacted	Description of Impact Determination
BIRDS						
American peregrine falcon (<i>Falco peregrinus anatum</i>)		T	Year-round resident and local breeder in west Texas, nests in tall cliff eyries; also, migrant across state from more northern breeding areas in US and Canada, winters along coast and farther south; occupies wide range of habitats during migration, including urban areas, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.	No	No	Preferred habitat is not present but the species is a potential migrant of the study area.
Arctic peregrine falcon (<i>Falco peregrinus tundrius</i>)		R	Migrant throughout state from subspecies' far northern breeding range, winters along coast and farther south; occupies wide range of habitats during migration, including urban areas, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.	No	No	Preferred habitat is not present but the species is a potential migrant of the study area.
Attwater's greater prairie-chicken (<i>Tympanuchus cupido attwateri</i>)		E	Historic range in this county; endemic; open prairies of mostly thick grass one to three feet tall; from near sea level to 200 feet along coastal plain on upper two-thirds of Texas coast; males form communal display flocks during late winter-early spring; booming grounds important; breeding February-July.	No	No	The study area does not contain the preferred habitat for this species.
Bald eagle (<i>Haliaeetus leucocephalus</i>)	DM	T	Nests and winters near large rivers, lakes, marshes, and along coasts; nests in tall trees or on cliffs near large bodies of water.	No	No	The study area does not contain the preferred habitat for this species.
Henslow's sparrow (<i>Ammodramus henslowii</i>)		R	Wintering individuals (not flocks) found in weedy fields or cut-over areas where an abundance of bunch grasses occur along with vines and brambles; a key component is bare ground for running/walking.	No	No	The study area does not contain the preferred habitat for this species.
Interior least tern (<i>Sterna antillarum athalassos</i>)		E	Found more than 50 miles from a coastline; nests along sand and gravel bars within braided streams, rivers; also known to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc.); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony.	No	No	Preferred habitat is not present but the species is a potential migrant of the study area.
Peregrine falcon (<i>Falco peregrinus</i>)		T	Migrates across the state from more northern breeding areas in US and Canada to winter along coast and farther south; same habitat as <i>F. p. tundrius</i> .	No	No	Preferred habitat is not present but the species is a potential migrant of the study area.
Sprague's pipit (<i>Anthus spragueii</i>)		R	Only in Texas during migration and winter, mid-September to early April; short to medium distance, diurnal migrant; strongly tied to native upland prairie, can be locally common in coastal grasslands, uncommon to rare further west; sensitive to patch size and avoids edges.	No	No	Preferred habitat is not present but the species is a potential migrant of the study area.

Table 5. Federal and State Protected Species in Wharton County and Summary of Potential Impacts

Species	USFWS*	TPWD**	Preferred Habitat	Habitat Present	Habitat Impacted	Description of Impact Determination
Western burrowing owl (<i>Athene cunicularia hypugaea</i>)		R	Inhabits open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows.	No	No	The study area does not contain the preferred habitat for this species.
White-faced ibis (<i>Plegadis chih</i>)		T	Prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats.	No	No	The study area does not contain the preferred habitat for this species.
White-tailed hawk (<i>Buteo albidcaudatus</i>)		T	Near coast on prairies, cordgrass flats, and scrub-live oak; further inland on prairies, mesquite and oak savannas, and mixed savanna-chaparral; breeding March-May.	No	No	The study area does not contain the preferred habitat for this species.
Whooping crane (<i>Grus americana</i>)	E, EXPN	E	Potential migrant via plains through most of the state to coast; inhabits estuaries, prairies, marshes, savannahs, grasslands, croplands, pastures; roosts in riverine habitat on submerged sandbars in wide, unobstructed channels isolated from human disturbance; winter resident in coastal marshes of Aransas, Calhoun and Refugio counties.	No	No	Preferred habitat is not present but the species is a potential migrant of the study area.
Wood stork (<i>Mycteria americana</i>)		T	Forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including saltwater; usually roosts communally in tall snags, sometimes in association with other wading birds (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.	Yes	May Impact	The study area may contain preferred habitat. Operations normally associated with vegetation removal could temporarily disturb existing habitat and displace wildlife populating the study area. Areas would be re-vegetated.
CRUSTACEANS						
A crayfish (<i>Cambarellus texanus</i>)		R	Shallow water; benthic, burrowing in or using soil; apparently tolerant of warmer waters; prefers standing water of ditches in which there is emergent vegetation; will burrow in dry periods; detritivore.	Yes	May Impact	The study area may contain preferred habitat. Operations normally associated with vegetation removal could temporarily disturb existing habitat and displace wildlife populating the study area. Areas would be re-vegetated.

Table 5. Federal and State Protected Species in Wharton County and Summary of Potential Impacts

Species	USFWS*	TPWD**	Preferred Habitat	Habitat Present	Habitat Impacted	Description of Impact Determination
FISHES						
American eel (<i>Anguilla rostrata</i>)		R	Coastal waterways below reservoirs to gulf; spawns January to February in ocean, larva move to coastal waters, metamorphose, then females move into freshwater; most aquatic habitats with access to ocean, muddy bottoms, still waters, large streams, lakes; can travel overland in wet areas; males in brackish estuaries; diet varies widely, geographically, and seasonally.	Yes	May Impact	The study area may contain preferred habitat. Operations normally associated with vegetation removal could temporarily disturb existing habitat and displace wildlife populating the study area. Areas would be re-vegetated.
Blue sucker (<i>Cycleptus elongatus</i>)		T	Larger portions of major rivers in Texas; usually in channels and flowing pools with a moderate current; bottom type usually of exposed bedrock, perhaps in combination with hard clay, sand, and gravel; adults winter in deep pools and move upstream in spring to spawn on riffles.	No	No	The study area does not contain the preferred habitat for this species.
Sharpnose shiner (<i>Notropis oxyrhynchus</i>)		R	Endemic to Brazos River drainage; also, apparently introduced into adjacent Colorado River drainage; large turbid river, with bottom a combination of sand, gravel, and clay-mud.	No	No	The study area does not contain the preferred habitat for this species.
MAMMALS						
Louisiana black bear (<i>Ursus americanus luteolus</i>)	T	T	Possible as transient; bottomland hardwoods and large tracts of inaccessible forested areas.	No	No	While this species' historic range includes east Texas, the current range is restricted to central Louisiana.
Plains spotted skunk (<i>Spilogale putorius interrupta</i>)		R	Catholic; inhabits open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie.	Yes	May Impact	The study area may contain preferred habitat. Operations normally associated with vegetation removal could temporarily disturb existing habitat and displace wildlife populating the study area. Areas would be re-vegetated.
Red wolf (<i>Canis rufus</i>)		E	Extirpated; formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies.	No	No	This species is considered extirpated.
MOLLUSKS						
Creeper (squawfoot) (<i>Strophitus undulatus</i>)		R	Small to large streams, prefers gravel or gravel and mud in flowing water; Colorado, Guadalupe, San Antonio, Neches (historic), and Trinity (historic) River basins.	No	No	The study area is within the Colorado-Lavaca Coastal Basin; therefore, the study area does not contain the preferred habitat for this species.
False spike mussel (<i>Quincuncina mitchell</i>)		T	Substrates of cobble and mud, with water lilies present; Rio Grande, Brazos, Colorado, and Guadalupe (historic) river basins.	No	No	The study area is within the Colorado-Lavaca Coastal Basin; therefore, the study area does not contain the preferred habitat for this species.

Table 5. Federal and State Protected Species in Wharton County and Summary of Potential Impacts

Species	USFWS*	TPWD**	Preferred Habitat	Habitat Present	Habitat Impacted	Description of Impact Determination
Smooth pimpleback (<i>Quadrula houstonensis</i>)		T	Small to moderate streams and rivers as well as moderate size reservoirs; mixed mud, sand, and fine gravel, tolerates very slow to moderate flow rates, appears not to tolerate dramatic water level fluctuations, scoured bedrock substrates, or shifting sand bottoms, lower Trinity (questionable), Brazos, and Colorado River basins.	No	No	The study area is within the Colorado-Lavaca Coastal Basin; therefore, the study area does not contain the preferred habitat for this species.
Texas pimpleback (<i>Quadrula petrina</i>)		T	Mud, gravel, and sand substrates, generally in areas with slow flow rates; Colorado and Guadalupe river basins.	No	No	The study area does not contain the preferred habitat for this species.
Texas fawnsfoot (<i>Truncilla macrodon</i>)		T	Little known; possibly rivers and larger streams, and intolerant of impoundment; flowing rice irrigation canals, possibly sand, gravel, and perhaps sandy-mud bottoms in moderate flows; Brazos and Colorado River basins.	No	No	The study area is within the Colorado-Lavaca Coastal Basin; therefore, the study area does not contain the preferred habitat for this species.
REPTILES						
Texas horned lizard (<i>Phrynosoma cornutum</i>)		T	Open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September.	No	No	The study area does not contain the preferred habitat for this species.
Timber/ canebrake rattlesnake (<i>Crotalus horridus</i>)		T	Swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone bluffs, sandy soil, or black clay; prefers dense ground cover, i.e. grapevines or palmetto.	Yes	May Impact	The study area may contain preferred habitat. Operations normally associated with vegetation removal could temporarily disturb existing habitat and displace wildlife populating the study area. Areas would be re-vegetated.
<p>Notes: *USFWS listing DM = Delisted/Recovered, Being Monitored First Five Years E =Endangered, EXPN = Experimental Population, Non- Essential T = Threatened **TPWD listing E = Endangered T = Threatened R = Rare Sources: TPWD Annotated List of Rare Species for Wharton County (updated October 10, 2011); searched January 19, 2012. USFWS Species by County Report for Wharton County, Texas. Updated and searched January 19, 2012.</p>						

In addition, a database search for protected species was conducted using the Texas Natural Diversity Database (TXNDD) on September 26, 2011. Data was reviewed for the known locations of species on the "El Campo" and "Pierce" USGS 7.5-minute quadrangle maps. The search revealed no Element Occurrence Records (records of sightings of rare or endangered species) or managed areas within 1.5 miles of the study area. Given the small proportion of public versus private land in Texas, the TXNDD does not include a representative inventory of rare resources in the state. Although it is based on the best data available to TPWD regarding rare species, these data cannot provide a definitive statement as to the presence, absence, or condition of special species, natural communities, or other significant features in any area. This data cannot substitute for an on-site evaluation by qualified biologists. The TXNDD information is intended to assist users in avoiding harm to rare species or significant ecological features. Refer all requests back to the TXNDD to obtain the most current information.

No Action Alternative – Under the No Action Alternative, there would be no impacts to the biological resources, including state listed species.

Proposed Action Alternative – FEMA has determined that the proposed project will have no effect to federally threatened and endangered species or critical habitat. Preferred habitats of five state protected species occur in the study area: the wood stork, the timber/canebrake rattlesnake, the A crayfish, the American eel, and the plains spotted skunk. However, no evidence or visual sighting of any state listed species was observed during the field investigations. The study area may contain preferred habitat. Operations normally associated with vegetation removal could temporarily disturb existing habitat and displace wildlife populating the study area. Areas would be re-vegetated, and no longer-term impacts are anticipated.

4.4 Cultural Resources

Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended requires federal agencies "to take into account" the "effect" that an undertaking would have on historic properties. Historic properties are those included in or eligible for inclusion in the National Register of Historic Places (NRHP) and may include archeological sites, buildings, structures, sites, objects, and districts. In accordance with the Advisory Council on Historic Preservation regulations pertaining to the protection of historic properties (36 CFR 800.4), federal agencies are required to identify and evaluate historic resources for NRHP eligibility and assess the effects that the undertaking would have on historic properties. Compliance with state laws such as the Antiquities Code of Texas (13 Texas Administrative Code 26) is also required for the proposed project due to the involvement of the City of El Campo in the undertaking, due to their status as a political subdivision of the State of Texas.

No Action Alternative – Under the No Action Alternative, there would be no impacts to cultural resources because no ground would be disturbed.

Proposed Action Alternative – Compliance with state and federal laws requires consultation with the Texas Historical Commission (THC), Texas State Historic Preservation Officer (SHPO), and/or federally-recognized tribes to determine the effect of the Proposed Action Alternative on cultural resources. During the SRL grant application preparation, a scoping letter was sent to SHPO on November 18, 2010. The SHPO responded that a cultural resources survey would be required prior to construction of the proposed project. An Antiquities Permit application was submitted to THC (per the Antiquities Code of Texas) on March 2, 2012. Initial consultation has resulted in the issuance of an Antiquities Permit #6217 by the THC on April 6, 2012 to conduct archeological investigations of the project's archeological area of potential effect (APE), established as the area of ground disturbance. In addition, the initial consultation has resulted in the determination of the historic properties APE as the boundaries of parcels adjacent to the area of construction, as indicated by THC reviewer Linda Henderson via personal communication on March 26, 2012. A cultural resources survey was conducted and *Permit #6217 – Cultural Resources Survey along Tres Palacios Creek in El Campo, Wharton County, Texas* was submitted for review to the SHPO under Section 106 and the Antiquities Code of Texas on July 25, 2012. On August 2, 2012, SHPO made a determination that the proposed project would have no adverse effect on National Register eligible or listed properties and the project may proceed as planned. No additional coordination with SHPO is required. See **Appendix E** for agency coordination with SHPO and **Appendix F, Cultural Resource Survey Report**.

Based on the cultural resources survey and consultation with the SHPO, FEMA has determined that the Proposed Action Alternative will have no effect on historic properties. In the event that archeological deposits, including any Native American pottery, stone tools, bones, or human remains, are uncovered, the project shall be halted and the applicant shall stop all work immediately in the vicinity of the discovery and take all reasonable measures to avoid or minimize harm to the finds. All archeological findings will be secured by the applicant and access to the sensitive area will be restricted by the applicant. The applicant will inform TDEM and FEMA immediately, and FEMA will consult with the SHPO. Work in sensitive areas shall not resume until consultation is completed and until FEMA determines that the appropriate measures have been taken to ensure complete project compliance with the NHPA and its implementing regulations.

4.5 Socioeconomic Resources

4.5.1 Environmental Justice

EO 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations) mandates that federal agencies identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. In an effort to determine if the proposed action would have a disproportionate impact on minority or low-income persons, the socioeconomic and demographic data for the study area was reviewed. The socioeconomic data was retrieved from the USCB on April 23, 2012.

Located in Wharton County, Texas, the study area is within two census tract (48-481-7407 and 48-481-7410) and two census block groups (48-481-7407-1 and 48-481-7410-1) from the 2010 Census. In addition, the study area contains a portion of the City of El Campo, Texas. To assess the potential impacts of the project on persons of minority races and ethnicities, the 2010 Census data for the City of El Campo and the two census block groups that contains the study area was compared to the data for the larger reference area of the surrounding census tracts, county, and state. This data is displayed in **Table 6**. According to the 2010 Census data, the block groups and the census tracts reported individual races having populations well below 50 percent. The 2010 Census data; however, has the block groups and the census tracts with a Hispanic or Latino population percentage of more than 50 percent. In addition, the Hispanic or Latino population percentage for the City of El Campo is slightly less than 50 percent with 47 percentage of the population being Hispanic or Latino. Although census data indicates that the Hispanic or Latino population is higher than 50 percent in the vicinity of the study area, the percentage of Hispanic or Latino population in Texas (37.6 percent) is considerably higher than throughout the United States (16.3 percent). In addition, although rural Hispanic populations are increasing throughout the United States, they are particularly high in Texas where 27.2 percent of the rural population is Hispanic as compared to 5.6 percent throughout the United States.

To assess the potential impacts of the project on low-income populations, the median household income for the City of El Campo, the census tracts (48-481-7407 and 48-481-7410), and Wharton County was compared to the United States Department of Health and Human Services (USDHHS) poverty guidelines and the USCB poverty thresholds for 2010. Although income data was not obtained in the 2010 Census, the American Community Survey (ACS) provides a five year average of income and poverty information for the City of El Campo, the surrounding Census Tracts 7407 and 7410, and Wharton County. The ACS is an ongoing nationwide survey that provides social, economic, and housing data every year. All ACS data are estimates; therefore, the USCB provides a margin of error (MOE) for every ACS estimate. The ACS data indicates that the 2010 estimated median household income for El Campo was \$44,792¹, for

¹ MOE +/- 4,833

Census Tract 7407 was \$26,818², for Census Tract 7410 was \$35,087³, and for Wharton County was \$41,148⁴. The average household size for the investigated geographies ranged from 2.51 to 3.58 with an average MOE of +/- 0.037. Therefore, in order to provide a more accurate comparative to the USDHHS and USCB poverty determination measures, the household income for a family of four was used. The 2010 USDHHS poverty guideline for a family of four was \$22,050 and the 2010 USCB poverty threshold for a family of four was \$22,314⁵. Based on the ACS data, the household income for the El Campo, the surrounding Census Tracts 7407 and 7411, and Wharton County were above the USDHHS poverty guideline and the USCB poverty threshold for a family of four.

Table 6. Minority and Low Income Populations within the Study Area and Surrounding Areas

Census Geography	Total Population	Not Hispanic or Latino ¹					Hispanic or Latino (All Races) (%)	Population Below Poverty Level (%) ³
		Black/ African American (%)	American Indian/ Alaska Native (%)	Asian (%)	Native Hawaiian/ Pacific Islander (%)	Other (%) ²		
Texas	25,145,561	11.5	0.3	3.8	<0.1	1.4	37.6	16.8
Wharton County	41,280	13.7	0.2	0.4	<0.1	0.6	37.4	17.2
El Campo, Texas	11,602	10.4	<0.1	0.5	<0.1	0.5	47.0	17.4
Census Tract 7407	1,875	8.9	0.2	<0.1	0	0.7	59.1	19.2
Census Tract 7410	4,313	15.6	0.3	0.7	0	0.5	51.4	23.3
Blocks Group 7407-1	1,875	8.9	0.2	<0.1	0	0.7	59.1	N/A
Blocks Group 7410-1	982	23.8	<0.1	0.6	0	0.2	58.9	N/A

Source: USCB 2010 SF1 Table P9; 2010 ACS 5-year Estimates Table S1701
¹ The USCB 2010 data considers race and ethnicity to be separate identities. SF1 Table P9 provides race data by "Hispanic or Latino" and "Not Hispanic or Latino" ethnicities.
² Combines USCB Table P9 categories 'Some other race alone' and 'Two or more races'
³ MOE: Texas=+/- 0.1; Wharton County=+/-2.3; Census Tract 7407=+/-9.9; Census T 7410=+/-9.2
³ Not available at Block Group level.

² MOE +/- 11,200

³ MOE +/- 8,904

⁴ MOE +/- 2,808

⁵ Value reflects the weighted average threshold.

In order to further assess the potential impacts of the project on low-income populations, a review of the ACS 2010 estimates for *Poverty Status in the Past 12 Months* shows a percentage of the population living below poverty level status for the City of El Campo, the surrounding Census Tracts 7407 and 7410, and in Wharton County. This data is based off individual income, rather than median household income that the USDHHS poverty guidelines and the USCB poverty thresholds utilize. This data is included in **Table 6**. The data reviewed indicates that low-income individuals, as well as minorities, live in the study area.

No Action Alternative – Under the No Action Alternative, there would be no disproportionately high or adverse impacts to minority or low-income populations. All affected residents of El Campo would continue to be at risk of future flooding events.

Proposed Action Alternative – The benefits of the flood mitigation project are expected to equally benefit all residents in the City of El Campo and Wharton County, because approximately 608 structures will be removed from the 100-year floodplain. The Proposed Action Alternative would not adversely impact minority or low-income populations.

4.5.2 Hazardous Materials

Hazardous wastes, as defined by the Resource Conservation and Recovery Act (RCRA), are defined as “a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may; (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible or incapacitating reversible illness or; (2) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.”

Hazardous materials and wastes are regulated in Texas by a combination of federal laws and state laws. Federal regulations governing the assessment and disposal of hazardous wastes include RCRA, the RCRA Hazardous and Solid Waste Amendments, Comprehensive Environmental Response, Compensation and Liability Act, Solid Waste Act, and Toxic Substances Control Act.

A hazardous materials regulatory database search was conducted in October 2010. The report was reviewed to determine the proximity of the known sites to the proposed project area. A site visit was also conducted on October 4, 2010 to determine if there was evidence of contamination at the sites within the immediate vicinity of the proposed project. **Table 7** provides a summary of the database search results. The database identified six facilities within the specified distance parameters. See **Appendix G, GeoSearch Hazardous Materials Report**. There are two facilities located directly adjacent to the proposed project location. A summary of the two sites are listed after **Table 7**.

Table 7: Hazardous Materials Database Review Summary

Database	Search Distance (mile)	Number Within Search Distance
Federal Resource Conservation and Recovery Act – Generator Facilities (RCRAG)	Target Property and Adjoining	0
Federal Brownfields Management System (BF)	0.5	0
Federal No Further Remedial Action Planned Sites (NFRAP)	0.5	2
Federal Resource Conservation and Recovery Act – Corrective Action Facilities (RCRAC)	0.5	0
State Industrial and Hazardous Waste Sites (IHW)	0.25	3
State Petroleum Storage Tanks (PST)	0.25	13
State Affected Property Assessment Reports (APAR)	0.5	1
State Closed and Abandoned Landfill Inventory (CALF)	0.5	0
State Leaking Petroleum Storage Tanks (LPST)	0.5	5
State Municipal Solid Waste Landfill Sites (MSWLS)	0.5	0
State Tier II Chemical Reporting Program Facilities (TIERII)	0.5	10
Voluntary Cleanup Program (VCP)	0.5	0
Total		34

State Tier II Chemical Reporting Program Facilities (TIERII) – Two facilities are identified in the Tier II database adjacent to the proposed project location. The first facility, Acetylene Oxygen Company, is located at 909 South Mechanic Street approximately 0.01 miles southwest of the proposed project location. The site was identified four times in the Tier II database. In February 2007, the site was reported to have propane stored in a fenced dock area in front of the main building. The facility was also reported to have passed all validation checks. The facility was reported again in February 2008, 2009, and 2010 to have propane stored in a fenced dock area in front of the main building. The facility passed all validation checks.

The second facility identified in the Tier II database is the City of El Campo Wastewater Treatment Plant (WWTP) located at 201 East Thompson Street. The facility is located approximately 0.02 miles west of the proposed project location. The facility was identified three separate times in the Tier II database. In 2008, chlorine gas and sulfur dioxide were identified and listed to be stored next to the chlorine contact chamber. Approximately 2,000 pounds of chlorine gas and 4,000 pounds of a liquid and gas sulfur dioxide mixture were identified. The facility was listed again in 2009 and 2010 with the same chemicals, amounts, and locations listed. The facility passed all validation checks for the three reports. The facility was also identified under the Facility Registry System and the National Pollutant Discharge Elimination System. An existing outfall structure discharges into Tres Palacios Creek in the vicinity of the WWTP.

No Action Alternative – Under the No Action Alternative, no construction would occur. There would be no potential to encounter hazardous materials.

Proposed Action Alternative –There are no known hazardous materials sites that would be affected by the proposed project. There will be no adverse impact to the existing WWTP outfall structure. The existing outfall will be incorporated into the design for the proposed project or will be modified as necessary to conform to the channel modifications. Contaminated soils are not expected to be encountered in the vicinity of the WWTP due to the facility passing all validation checks for the three reports reviewed. If encountered, any unusable equipment, debris, and material will be disposed of in an approved manner and location. In the event significant items (or evidence thereof) are discovered during implementation of the project, the applicant will handle, manage, and dispose of petroleum products, hazardous materials and toxic waste in accordance to the requirements and to the satisfaction of the governing local, state, and federal agencies. The contractor will take appropriate measures to prevent, minimize, and control the spill of hazardous materials in the construction staging area.

4.5.3 Noise

Noise is generally defined as unwanted sound and is most commonly measured in decibels (dB). The Day-Night Average Sound Level (DNL) is an average measure of sound. The DNL descriptor is accepted by federal agencies as a standard for estimating sound impacts and establishing sound guidelines for compatible land uses. EPA guidelines, and those of many other agencies, state that outdoor sound levels in excess of 55 dB DNL are "normally unacceptable" for noise-sensitive land uses such as residences, schools, or hospitals. The study area is located near both residential neighborhoods and open agricultural areas with several roadways crossings. Existing noise primarily comes from traffic. Noise levels within and adjacent to the study area would increase during construction activities as a result of construction equipment and increase vehicular activity.

No Action Alternative – Under the No Action Alternative, no construction would occur. There would be no impacts to noise levels.

Proposed Action Alternative – Under the Proposed Action Alternative, temporary short-term increases in noise levels are anticipated during the construction period. The study area is located along both residential neighborhoods and agricultural areas with homes immediately adjacent. To mitigate the noise impacts, construction activities will take place during normal business hours. Equipment and machinery used during construction must meet all federal, state, and local noise regulations.

4.5.4 Transportation

The study area is located along the Tres Palacios Creek from Business 59 to CR 406. State highways, county roads, neighborhood roadways, and a railroad crossing are located within the proposed study area. The project passes under 10 roadway bridges, one railroad bridge, and three isolated pipelines. The following roads are within the project limits (from northeast to southwest):

- Business 59
- Palacios Street
- FM 1163 (West 2nd Street)
- West 5th Street
- Pinchot Street
- State Highway (SH) 71
- FM 653 (South Wharton Street)
- US 59
- CR 406

Hydraulic data was also used to examine the adequacy of bridges and culverts along the Tres Palacios Creek for proper flow conveyance. A typical standard as taken from the Texas Department of Transportation (TxDOT) Hydraulic Design Manual is that county-maintained roads should pass at least the 5-yr flow and state-maintained roads should pass at least the 25-yr flow. Of the structures that were examined, CR 410, CR 422, and CR 442 were identified to need improvements including bridge widening, increased culvert sizes, and additional culvert barrels. These improvements are mainly recommended for safety reasons during a flood event and should be addressed as soon as funds allow.

No Action Alternative – Under the No Action Alternative, no construction would occur and there would be no impacts to transportation. However, residents in the City of El Campo and Wharton County would remain at risk of future flood damage.

Proposed Action Alternative – Under the Proposed Action Alternative, there are no anticipated impacts to any existing crossings. Along the existing roadways, it is anticipated there would be a minor temporary increase in the volume of construction traffic on roads in the immediate vicinity of the study area that could potentially result in slower traffic flow during the construction phase. To mitigate for potential delays, construction vehicles and equipment must be stored onsite in designated staging areas during project construction. Appropriate signage must be posted on affected roadways. Active pipelines crossing the channel will remain in service. During the design phase, pipelines will be reviewed to determine if anticipated impacts from the proposed channel design will affect their integrity. If it is

determined upgrades are necessary to maintain the integrity of the pipeline, modifications to the pipeline crossings will be included in the channel design.

4.5.5 Public Health and Safety

Safety and security issues considered in this EA include the health and safety of the area residents, the public-at-large, and the protection of personnel involved in activities related to the construction of the proposed flood mitigation project.

EO 13045 for the protection of children from environmental health and safety risks requires federal agencies to make it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children.

No Action Alternative -- Under the No Action Alternative, the Tres Palacios Creek would not be improved from Business 59 to CR 406. The homes and infrastructure previously affected by flooding would remain at risk of flooding and further damage. The health and safety of area residents could be compromised.

Proposed Action Alternative – Under the Proposed Action Alternative, improving the Tres Palacios Creek to a 50-year earthen channel will allow the channel to contain up to the 50-year flow reducing the flooding risk to 608 structures. The health and safety risks to area residents would be reduced by the proposed project.

During the construction phase of the proposed flood mitigation project, activities could present safety risks to those performing the activities, residents, and other pedestrians adjacent to the study area. All appropriate safety precautions would be taken to minimize risks to safety and human health. All construction activities will be performed using qualified safety personnel trained in the proper use of the appropriate equipment, including all appropriate safety precautions. All activities will be conducted according to with the standards set in the Occupational Safety and Health Administration (OSHA) regulations. Appropriate signage and barriers are to be in place prior to construction activities to alert and inform the pedestrians and motorists of the project activities. There would be no disproportionate health and safety risks to children.

4.5 Environmental Summary Table

Table 8 includes a summary of the potential impacts of the Proposed Action Alternative and the corresponding conditions or mitigation necessary to offset any potential impacts.

Table 8. Summary of Impacts and Mitigation Measures

Affected Environment / Resource Area	Impacts	Agency Coordination/Permits	Mitigation/BMPs
Geology and Soils	<p>No impacts to geology are anticipated.</p> <p>Soils would be disturbed within the limits of construction during construction.</p>	The applicant would prepare a SWPPP and obtain a TPDES permit prior to construction utilizing appropriate control measures.	<p>The applicant would prepare a SWPPP and obtain a TPDES permit prior to construction. Appropriate control measures (BMPs) would include:</p> <ul style="list-style-type: none"> • Prevention of stormwater pollution by controlling erosion and sedimentation • Comply with the SWPPP and revise when necessary • Post CSN with SWPPP information on or near the site • Submit a NOI when PSLs increase disturbed soil area to 5 acres or more
Air Quality	Short term impacts to air quality may occur during construction.	No agency coordination or permits are required.	Every effort would be made to minimize particulate matter emissions through suppression techniques. Contractors will be required to water down construction areas to reduce temporary air quality impacts. Emissions will be reduced by keeping idling times down and properly maintaining all fuel burning equipment.
Water Resources: Groundwater	No impacts to groundwater are anticipated.	No agency coordination or permits are required.	No mitigation is necessary.

Table 8. Summary of Impacts and Mitigation Measures

Affected Environment / Resource Area	Impacts	Agency Coordination/Permits	Mitigation/BMPs
Water Resources: Floodplains	The proposed flood mitigation project would improve the Tres Palacios Creek to a 50-year earthen channel. Work will occur within the floodway and floodplain.	The applicant will obtain permit from	<p>The applicant must coordinate with the local floodplain administrator and obtain required permits prior to initiating work. All coordination pertaining to these activities and applicant compliance with any conditions should be documented and copies forwarded to the state and FEMA for inclusion in the permanent project files.</p> <p>The work will be carried out according to the following conditions:</p> <ul style="list-style-type: none"> • No equipment, grading or disturbance will be allowed in the channel below the OHWM with the exception of specifically noted debris and sediment. Such work will be first coordinated with and done while the inspector is on the project. • No excess excavated material will be deposited in low area or along natural drainage ways. • No fill will be placed within the 100-year floodplain. • No material will be stored within the 100-year floodplain. • Contractor will preserve the existing flowline of the channel and perform grading and fill operations only on slopes and at the toe of slopes as indicated. • Select compacted fill will consist of Type "B" or "C" backfill (sandy gravel), as specified in the City of El Campo standard specifications. No placement of fill will occur below the OHWM of the channel. • Where slopes are greater than 4:1, 12 inch rock gabion mattress will be installed. No placement of gabion mattress will occur below the OHWM of the channel. • Contractor will ensure positive drainage (minimum 2 percent slope) for adjacent properties to the proposed channel improvements. • Hydro-mulch seeding will be used on disturbed slopes and ground per City of El Campo standard specifications.
Water Resources: Water Quality	This project will disturb more than five acres of earth disturbance.	Under the requirements of Section 402 of the Clean Water Act, the proposed flood mitigation project will meet the requirements of TCEQ TPDES CGP.	<p>The applicant shall ensure that best management practices are implemented to prevent erosion and sedimentation to wetlands. This includes equipment storage and staging of construction to prevent erosion and sedimentation to ensure that wetlands are not adversely impacted. Appropriate control measures (BMPs) would include:</p> <ul style="list-style-type: none"> • Prevention of stormwater pollution by controlling erosion and sedimentation • Comply with the SWPPP and revise when necessary • Post CSN with SWPPP information on or near the site • Submit a NOI when PSLs increase disturbed soil area to 5 acres or more

Table 8. Summary of Impacts and Mitigation Measures

Affected Environment / Resource Area	Impacts	Agency Coordination/Permits	Mitigation/BMPs
Water Resources: Surface Waters & Wetlands	All work will occur above the ordinary high water mark of waters of the United States. No wetlands will be impacted.	Agency coordination has occurred with the USACE. No permit under Section 404 of the Clean Water Act is required (Appendix E). The applicant would prepare a SWPPP and obtain a TPDES permit prior to construction utilizing appropriate control measures.	<ul style="list-style-type: none"> See floodplain mitigation measures.
Biological Resources: Wildlife Habitat	Vegetation in these areas would be removed and/or disturbed.	USFWS and TPWD were sent a scoping letter during the SRL grant application phase of this project, and no comments were received (Appendix E). No permit is needed.	BMPs will be in place to prevent erosion and to re-vegetate disturbed areas.
Biological Resources: Protected Species	Preferred habitats of five state protected species may be within the study area. No evidence or visual sighting of any listed species was observed during the field investigations. Operations normally associated with vegetation removal could temporarily disturb existing habitat and displace wildlife populating the study area. Areas would be re-vegetated, and no longer-term impacts are anticipated. No effect to federally listed species.	USFWS and TPWD were sent a scoping letter during the SRL grant application phase of this project, and no comments were received (Appendix E). No permit is needed.	During project development, engineers will design, use, and promote construction practices that minimize adverse effects on both regulated and unregulated wildlife habitat. In the event that any state-listed species are observed during clearing activities, the contractor would cease work in the immediate area and contact TPWD for further guidance.

Table 8. Summary of Impacts and Mitigation Measures

Affected Environment / Resource Area	Impacts	Agency Coordination/Permits	Mitigation/BMPs
Cultural Resources	No adverse effects to National Register eligible or listed properties.	Agency coordination has occurred with SHPO (Appendix E). No further coordination is required.	In the event that archeological deposits, including any Native American pottery, stone tools, bones, or human remains, are uncovered, the project shall be halted and the applicant shall stop all work immediately in the vicinity of the discovery and take all reasonable measures to avoid or minimize harm to the finds. All archeological findings will be secured by the applicant and access to the sensitive area will be restricted by the applicant. The applicant will inform TDEM and FEMA immediately, and FEMA will consult with the SHPO. Work in sensitive areas shall not resume until consultation is completed and until FEMA determines that the appropriate measures have been taken to ensure complete project compliance with the NHPA and its implementing regulations.
Socioeconomic Resources: Environmental Justice	All populations would benefit including minority or low-income populations.	No agency coordination/permits required.	No mitigation/BMPs required.
Socioeconomic Resources: Hazardous Materials	There are no known hazardous materials sites that would be affected by the proposed project.	No agency coordination/permits required.	Unusable equipment, debris, and material will be disposed of in an approved manner and location. In the event significant items (or evidence thereof) are discovered during implementation of the project, the applicant will handle, manage, and dispose of petroleum products, hazardous materials and toxic waste in accordance to the requirements and to the satisfaction of the governing local, state, and federal agencies.
Socioeconomic Resources: Noise	Short-term increases in noise levels would occur during construction.	No agency coordination/permits required. Contractor will be required to follow City of El Campo noise restrictions during construction, as applicable.	Construction activities will take place during normal business hours. Equipment and machinery used during construction must meet all federal, state, and local noise regulations.
Socioeconomic Resources: Transportation	Minor temporary increase in the traffic volume of construction traffic on roads in the immediate vicinity of the proposed flood mitigation project that could potentially result in slower traffic flow during the construction phase.	No agency coordination/permits required. Contractor will be required to follow City of El Campo guidelines for traffic control plans, as applicable.	To mitigate for potential delays, construction vehicles and equipment will be stored onsite in designated staging areas during project construction. Appropriate signage will be posted on affected roadways.

Table 8. Summary of Impacts and Mitigation Measures

Affected Environment / Resource Area	Impacts	Agency Coordination/Permits	Mitigation/BMPs
Socioeconomic Resources: Public Health and Safety	During construction, activities could present safety risks to those performing the activities, residents, and other pedestrians adjacent to the study area.	No agency coordination/permits required.	<ul style="list-style-type: none"> • All appropriate safety precautions will be taken to minimize risks to safety and human health. • All construction activities will be performed using qualified safety personnel trained in the proper use of the appropriate equipment, including all appropriate safety precautions. • All activities will be conducted according to with the standards set in the OSHA regulations. • Appropriate signage and barriers are to be in place

5.0 CUMULATIVE IMPACTS

In accordance with NEPA, and to the extent reasonable and practical, the environmental assessment considered the combined effect of the Proposed Action Alternative and other actions occurring or proposed in the vicinity of the proposed flood mitigation project.

To date, no known additional actions are proposed in the study area. This alternative consists of increasing the flood storage capacity of Tres Palacios Creek by excavating sediment and grading to 4:1 side slopes. No grading or disturbance will occur within the channel below the ordinary high water mark (OHWM), in order to avoid disturbance to the natural channel. The project will necessitate the acquisition of an easement varying from 60-feet wide to 120-feet wide (**Figure 2** and **Appendix B**).

Currently, the majority of the study area is residential with some commercial properties, parkland, and religious institutions. Agricultural land dominates the southeastern portion of the study area. As shown on **Figure 4**, the 100-year floodplain encompasses a large portion of the City of El Campo; however, most is already developed. The proposed flood mitigation project should not encourage additional development in the floodplain. No cumulative impacts are anticipated.

6.0 AGENCY COORDINATION

Table 9 lists the resource agencies that were contacted by letter requesting project review during the preparation of this EA. Coordination letters and responses received are included in **Appendix E**.

Table 9. Summary of Agency Coordination

Agency	Correspondence to Agency		Agency Response	
	Date	Description	Date	Description
USFWS	10/15/2010	Initial scoping letter to USFWS	-	-
TPWD	10/15/2010	Initial scoping letter to TPWD	-	-
TCEQ	10/15/2010	Initial scoping letter to TCEQ	10/19/2010	TCEQ acknowledges receipt of scoping letter
USACE	10/15/2010	Initial scoping letter to USACE, Galveston District	11/04/2010	USACE acknowledges receipt of scoping letter
	06/08/2012	Request for Concurrence Letter to USACE (included JD Report, 30 percent design plans, and shape files of delineated wetlands) (See Appendix D for a copy of the report)	08/21/2012	USACE approved jurisdictional determination.
SHPO	11/18/2010	Initial coordination letter to SHPO	12/22/2010	SHPO response, and requests survey
	03/02/2012	Antiquities Permit Application to SHPO	04/06/2012	SHPO issued Antiquities Permit
	07/25/2012	<i>Permit #6217 – Cultural Resources Survey along Tres Palacios Creek in El Campo, Wharton County, Texas</i> submitted for review under Section 106 and the Antiquities Code of Texas (See Appendix F for a copy of the report)	08/02/2012	SHPO Determination: No Adverse on National Register eligible or listed properties. Project may proceed.

7.0 PUBLIC INVOLVEMENT

To facilitate regional input into the planning process, three public meetings were held within the Tres Palacios region. The first meeting was held in El Campo, Texas on December 15, 2009, the second was held in Bay City, Texas on March 23, 2010, and the final meeting was held in El Campo, Texas on April 20, 2010. These public meetings served to inform the public about the planning study and to gather information that could be used to enhance and confirm the study results and conclusions. This study has resulted in new planning and regulatory information for use in floodplain management as well as flood reduction alternative analyses for the City of El Campo, Wharton County, and Matagorda County **(Appendix C)**.

Once approved by FEMA, the Draft EA will go out for a 30-day public comment period. Publication of notice, and any comments received during the comment period will be included in **Appendix H**.

8.0 LIST OF PREPARERS

Document Preparers:

Mark McGraw, P.E., Project Manager, Halff Associates, Inc.
Tricia Mosier, Environmental Manager, Halff Associates, Inc.
Crystal Hall, Staff Geologist, Halff Associates, Inc.
Mike Chavez, Archeologist, Halff Associates, Inc.
Joel Butler, Archeologist, AmaTerra Environmental, Inc.
Steven Eisenhour, Historian, AmaTerra Environmental, Inc.
Steven Buffum, P.E., Engineer, Halff Associates, Inc.
Daniel Harris, P.E., Engineer, Halff Associates, Inc.

Government Contributors:

Marty Chester, Mitigation Specialist, FEMA Region 6
Kevin Jaynes, Regional Environmental Officer, FEMA Region 6
Dorothy Weir, Environmental Specialist, FEMA Region 6

Local Sponsor Contributors:

Mindi Snyder, City Manager, City of El Campo, Texas

