MITIGATION PLAN FOR
JEFFERSON COUNTY DRAINAGE DISTRICT NO. 7
HURRICANE PROTECTION FLOOD WALL EMERGENCY REPAIRS
PORT ARTHUR, JEFFERSON COUNTY, TEXAS
USACE PROJECT NUMBER: SWG-2017-00555
HJN 180025-001PA

PREPARED FOR:

JEFFERSON COUNTY DRAINAGE DISTRICT NO. 7
PORT ARTHUR, TEXAS

PREPARED BY:

HORIZON ENVIRONMENTAL SERVICES, INC.

Rev. MARCH 2018

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1.0 INTRODUCTION

Jefferson County Drainage District No. 7 (DD7) has constructed emergency repairs and stabilization of a portion of the Port Arthur Hurricane Protection Flood Wall across the historical channel of Taylors Bayou. The flood wall is located at the northern terminus of the Taylors Bayou Turning Basin, approximately 1.17 miles south-southwest of the intersection of State Highway 87 and West Levee Road, in Port Arthur, Jefferson County, Texas as shown on Figure 1 (Appendix A). The Global Positioning System (GPS) location of the center of the project is approximately 29.850176 Latitude and -93.972344 Longitude.

Portions of the Project Site is located within the FEMA 100-year floodplain of the Neches River (FIRM Panel Number 4803850165C). The project site is surrounded by industrial and refinery facilities, pipelines, transmission lines, railroad, highway, and the turning basin along the east side.

The flood wall was found to be damaged at the end of August 2017, potentially due to the loss of supporting sediments against the wall on the turning basin side. Sections of the wall separated and a portion of the wall has deflected into the turning basin approximately 10 feet. Emergency repairs and stabilization were implemented in late 2017.

Permit drawings are provided in Appendix A.

2.0 JURISDICTIONAL IMPACTS

Figure 2 (Appendix A) indicates the pre-construction wetlands and other waters based on aerial photography analysis and field verification. Figure 3 represents the current conditions as documented by aerial drone photography. Figure 4 indicates the project impacts based on field assessment and aerial drone photography. Figure 5 is a typical cross-section. See photographs in Appendix B.

On August 11, 2017, an emergency procedure request was granted to JCDD#7 by the USACE to perform immediate repairs to the Hurricane Protection Flood Wall (HPFW) that included the installation of sheet pile walls, the discharge of approximately 3650 cubic yards of sand, bull rock and super-sack sand bags to repair a scour hole, and installation of 637-linear feet of sheet pile wall. Additional fill (approximately 1150 cubic yards) was also placed for equipment access and materials storage.

Impacts to waters of the US from the emergency repairs are as follows:

Tidal emergent marsh – 0.71 ac
Non-tidal emergent marsh – 0.04 ac
Tidal open water - 0.26 ac

All impacts are considered permanent. DD7 desires to maintain the crane pad for future use in wall repair and maintenance.

3.0 MITIGATION PLAN OVERVIEW

3.1 Mitigation Objectives

The remnants of Taylors Bayou at the project site are highly impacted and modified by channel diversions; ship channel use; road, rail, pipeline crossings; and runoff from adjacent industrial facilities. As a result, the adjacent wetlands on the project site are also deemed to be of relatively low value. JCDD7 proposes to preserve and manage a 3 acre forested site in the Taylors Bayou watershed that is adjacent to a large forested wetland conservation site in Jefferson County (Appendix B). The proposed mitigation plan will provide a 2.3:1 ratio of preserved forested wetlands (1.75 ac) with additional adjacent uplands (1.25 ac) for a total of 3 acres for the 0.75 acre of impact to open emergent marsh. The preservation site is adjacent to an existing 2000 acre ecological preserve and is in the same watershed as the impact site.

3.2 Site Selection

Mitigation bank sites in or servicing Jefferson County are very limited. The impact site is within the secondary service area of Daisetta Swamp Mitigation Bank. However, the Daisetta MB is in another watershed (Trinity River) and only provides out-of-kind mitigation credits (forested wetlands). The proposed mitigation site, while also out-of-kind, is in the same watershed as the impact site and will continue to provide a high level of wetland functions for the watershed. We believe this PRM plan will provide the best compensation for the impacts within the same watershed in accordance with the guidance in the 2008 Mitigation Rule.

3.3 Site Protection

Within 180 days of approval of this after-the-fact permit action, the Permittee will establish a conservation easement approved by the USACE and held by a qualified third-party 501(c)(3) land trust approved by the USACE (likely Bayou Land Conservancy that holds the conservation easement on the adjacent 2000 acre wetland conservation area).

3.4 Baseline Information

The project site prior to the emergency repair work was in part a tidal fringe marsh adjacent to the remnant of Taylors Bayou that had been previously impacted by rail facilities, pipelines, and other utilities. Portions of the site had been previously filled for rail spurs and the existing rail. Two small perched wetlands (non-tidal) were present between the old rail spur fills and Highway 87. Dominant plant species in the tidal fringe marsh include saltmarsh bulrush (Schoenoplectus maritimus), saltgrass (*Distichlis* spicata), and marshhay cordgrass (*Spartina patens*). The two small non-tidal wetlands are vegetated with panicum (*Panicum rigidulum*.), umbrella sedge (*Cyperus sp.*), spikerush (*Eleocharis sp.*), and blackberry vine (*Rubus louisianus*),

The proposed mitigation site is a forested upland/wetland complex (Appendix B. Common species of the wetland include red maple (*Acer rubrum*), laurel oak (*Quercus laurifolia*), dwarf palmetto (*Sabal minor*), and scattered Chinese tallow (*Triadica sebifera*). The uplands are dominated by water oak (*Quercus nigra*), sweetgum (*Liquidambar styraciflua*), loblolly pine (*Pinus taeda*), yaupon (*Ilex vomitoria*), Waxmyrtle (*Myrica cerifera*), American beautyberry (*Callicarpa americana*), and grape (*Vitis rotundifolia*) (see photographs in Appendix C). The mitigation site drains to Green Pond Gully which drains to the North Fork of Taylors Bayou.

3.5 Mitigation Acreage

The Permittee will permanently preserve 3.0 acres of forested wetland/upland habitat located on a tributary of Taylors Bayou in Jefferson County (see photographs in Appendix C). The proposed preservation area is adjacent to an approximate 2000-acre preserve under conservation easement to Bayou Land Conservancy and owned and managed by Jefferson County Drainage District No. 6 (Figures 1 and 2, Appendix B). The 3-acre Preservation Area contains approximately 1.75 acres of forested wetlands (Figure 3, Appendix B).

3.6 Mitigation Work Plan

The Permittee will control noxious plant species on the preserve land. Noxious plant species will include Chinese tallow (*Triadica sebifera*), deep-rooted sedge (*Cyperus entranianus*), and giant salvinia (*Molesta spp.*). Noxious plant control will be implemented for a 5 year period following establishment of the preserve.

3.7 Maintenance Plan

The mitigation site is a generally self-sustaining preservation area. Annual site inspections will be made by the conservation easement holder who will note any maintenance issues that may be required. Other than invasive species control, no other significant maintenance requirements are expected.

3.8 Ecological Performance Standards

The goal of noxious plant control will be to achieve an aerial coverage of 5 % or less by noxious species over the 5 year period. If the percent aerial coverage of noxious plant species exceeds five percent in the survey areas, the Permittee will implement additional appropriate control methodologies to meet the Success Criteria any given year.

3.9 Monitoring Requirements

The Permittee will use vegetation sampling procedures approved by the USACE to annually survey and document the percent aerial coverage of noxious plant species. The Permittee will survey and document the percent aerial coverage of noxious plant species within the preservation area and report that information to the USACE in the annual report.

3.10 Long-term Management

The mitigation site is a generally self-sustaining preservation area. Annual site inspections will be made by the conservation easement holder who will note any management issues that may be required. Other than invasive species control, no other significant management requirements are expected.

3.11 Adaptive Management Plan

The mitigation site is a generally self-sustaining preservation area. Other than the possibility of fire or other natural disasters (hurricanes, tornados, extended drought, etc), no significant loss of the forest cover or ecological values of the site are expected over time. In the unlikely event of any significant loss of ecological values as may be reported by the conservation trustee, the permittee will coordinate with the USACE to determine appropriate reclamation procedures, if any.

3.12 Financial Assurances

The permittee is a publically funded subdivision of the State with obligations to maintain the permitted facilities and associated mitigation. The permittee has purchased the mitigation rights to the 3-acre parcel.

4.0 MITIGATION MONITORING AND REPORTING

The Permittee will establish a self-monitoring program that includes annual written compliance reports to the USACE due October 1 of each year, beginning 1 October of the first full growing season, and continuing for at least five years until the Success Criteria has been achieved for five consecutive years. The initial report will document pre-construction site conditions, including photographs and maps. Subsequent reports will address schedule changes and provide a summary of all construction and mitigation activities that occurred during the reporting period as well as document condition of the preserve area, including percentage of noxious plant species present.

APPENDIX A

PERMIT DRAWINGS

Date:	03/5/2018
Drawn:	GLS
HJN NO:	180025 PA
Source:	OSM, 2018

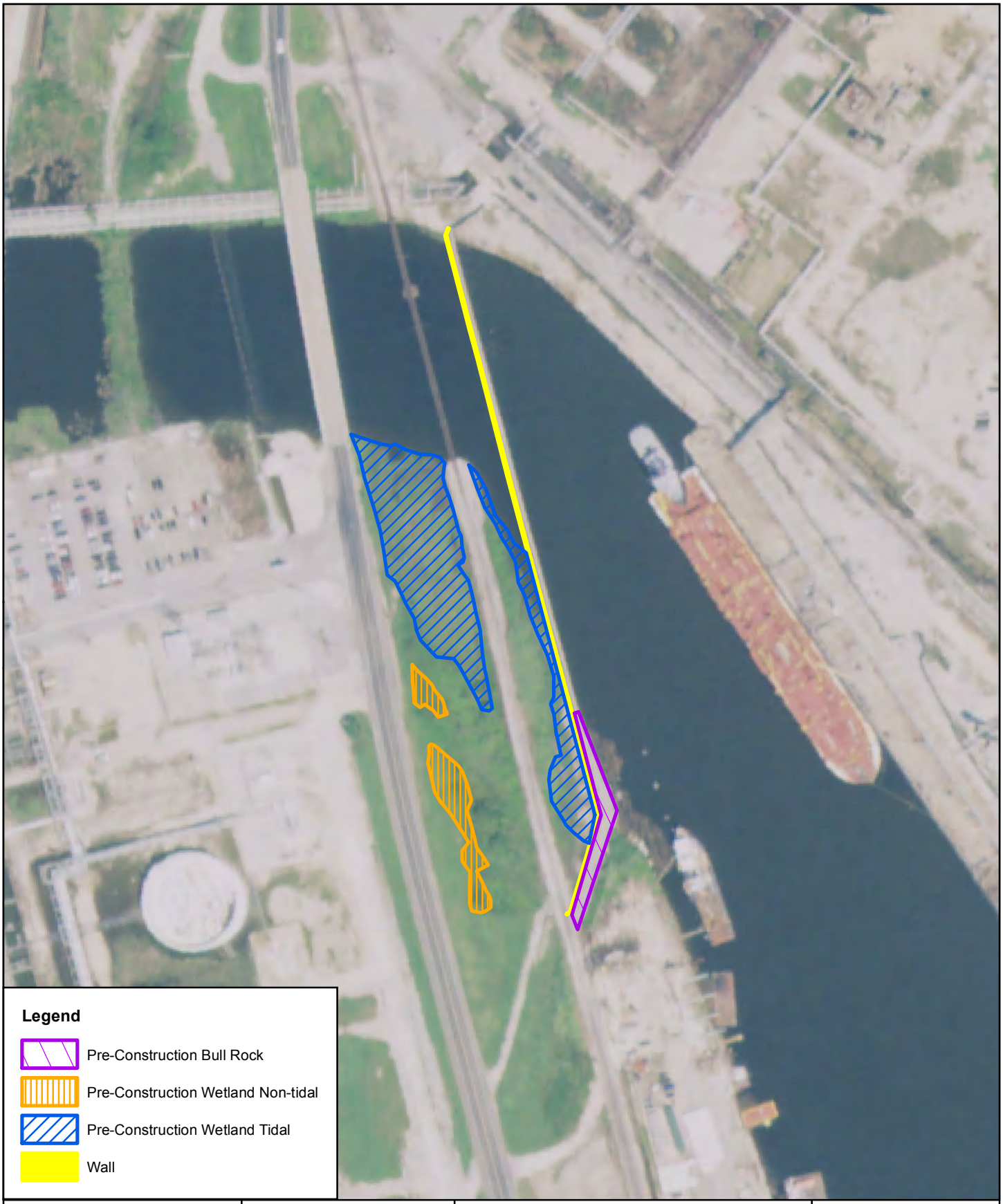
Horizon Environmental Services, Inc.

Figure 1

Vicinity Map
Hurricane Protection Flood Wall Repair
Port Arthur, Jefferson County, Texas

0 1,000 2,000
Feet

180025 - Taylor Bayou Flood Wall Repair\Graphics/180025PA_01A_VicinityMap.mxd



Horizon Environmental Services, Inc.

Date:	03/5/2018
Drawn:	GLS
HJN NO:	180025 PA
Source:	USDA, 2016

Figure 2

Pre-Construction Jurisdictional Waters
Hurricane Protection Flood Wall Repair
Port Arthur, Jefferson County, Texas

0 100 200
Feet

180025 - Taylor Bayou Flood Wall Repair\Graphics/180025PA_02A_PreConstruction.mxd

180025PA 03A Dronelmagery.dwg | GLS | 03/7/2018

Legend

- Pre-Construction Bull Rock
- Pre-Construction Wetland Non-tidal
- Pre-Construction Wetland Tidal
- Wall

Horizon Environmental Services, Inc.

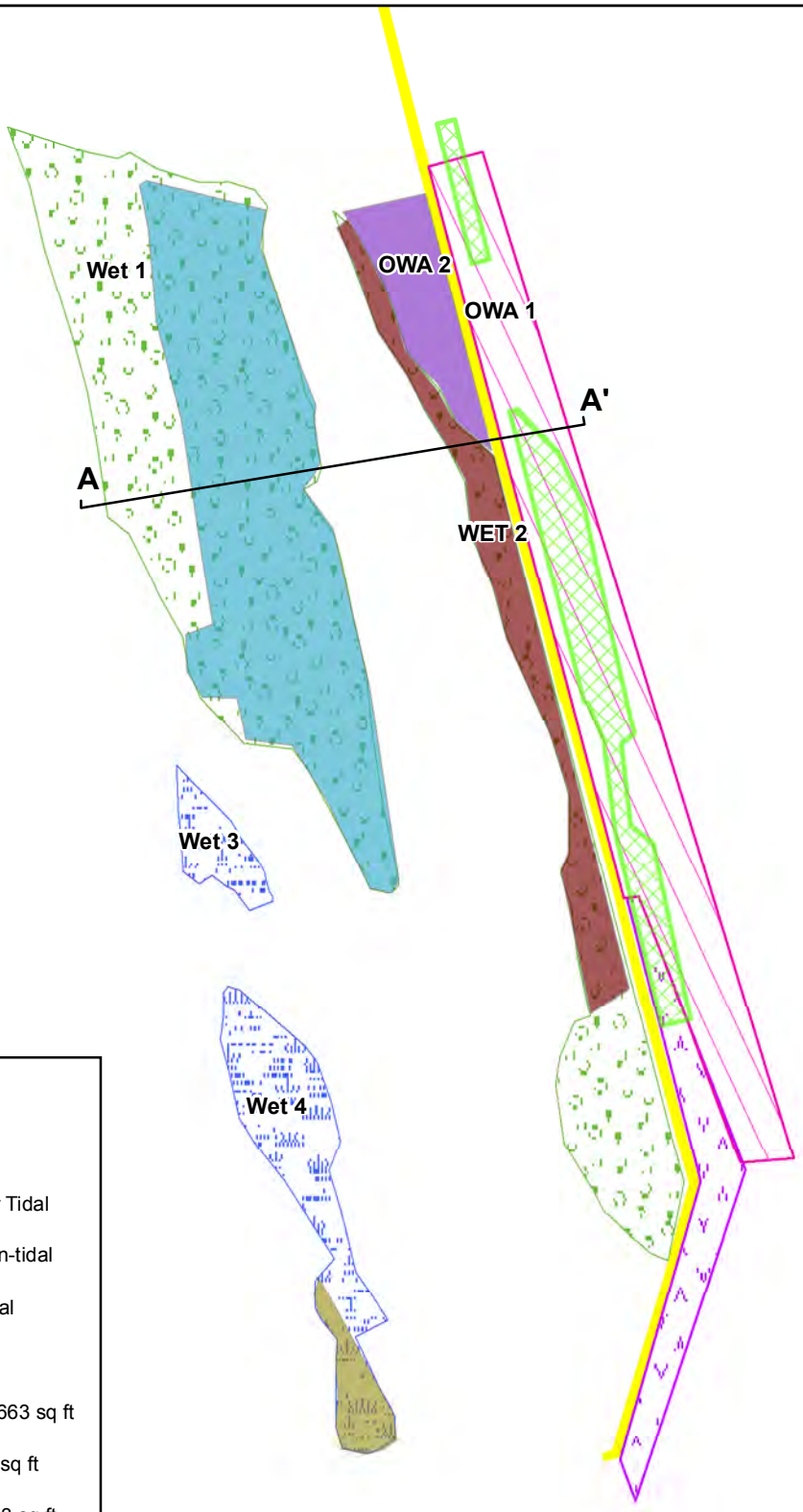
Date:	03/7/2018
Drawn:	GLS
HJN NO:	180025 PA
Source:	Client Provided

Figure 3

2018 Drone Imagery Map
Hurricane Protection Flood Wall Repair
Port Arthur, Jefferson County, Texas

N

0 60 120 Feet



Legend

- Pre-Construction Bull Rock
- Pre-Construction Open Water Tidal
- Pre-Construction Wetland Non-tidal
- Pre-Construction Wetland Tidal
- Wall
- Non-tidal Wetland Impact - 1,663 sq ft
- Open Water Impact 1 - 4,017 sq ft
- Sand and Bull Rock Fill - 7,103 sq ft
- Tidal Wetland Impact 1 - 24,189 sq ft
- Tidal Wetland Impact 2 - 6,560 sq ft

Horizon Environmental Services, Inc.

Date:	03/5/2018
Drawn:	GLS
HJN NO:	180025 PA
Source:	USDA, 2016

Figure 4

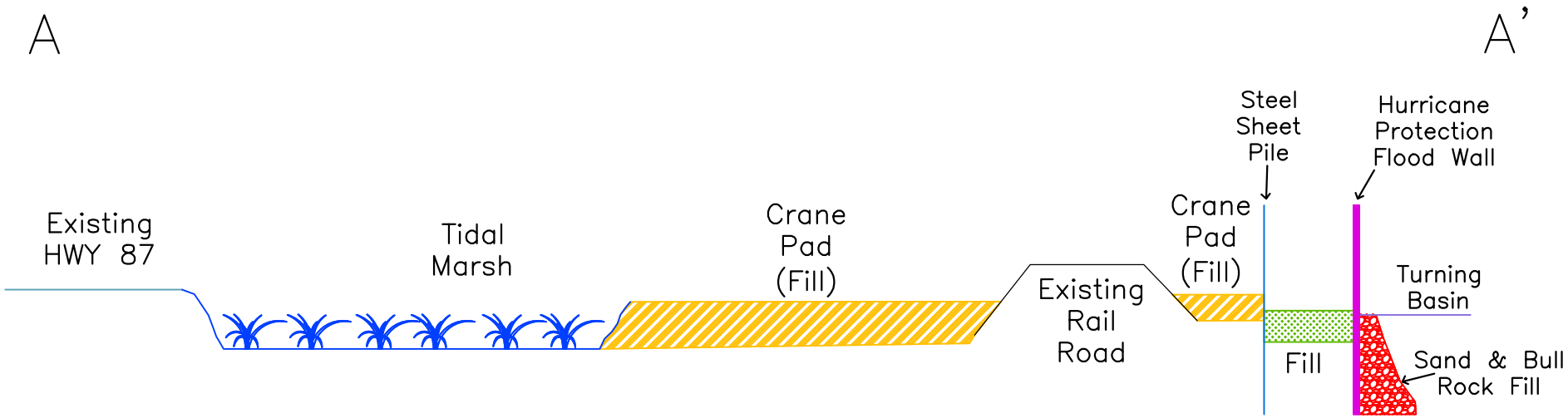
Impacted Jurisdictional Waters
Hurricane Protection Flood Wall Repair
Port Arthur, Jefferson County, Texas

0 50 100
Feet

180025 - Taylor Bayou Flood Wall Repair\Graphics/180025PA_04A_PostConstructionImpacts.mxd

"Do Not Scale This Drawing"

180025PA_05A_XCrossSection.dwg | GLS | 03/8/2018



Horizon Environmental Services, Inc.

Date:	03/8/2018
Drawn:	GLS
HJN NO:	180025 PA
Source:	Horizon

Figure 5

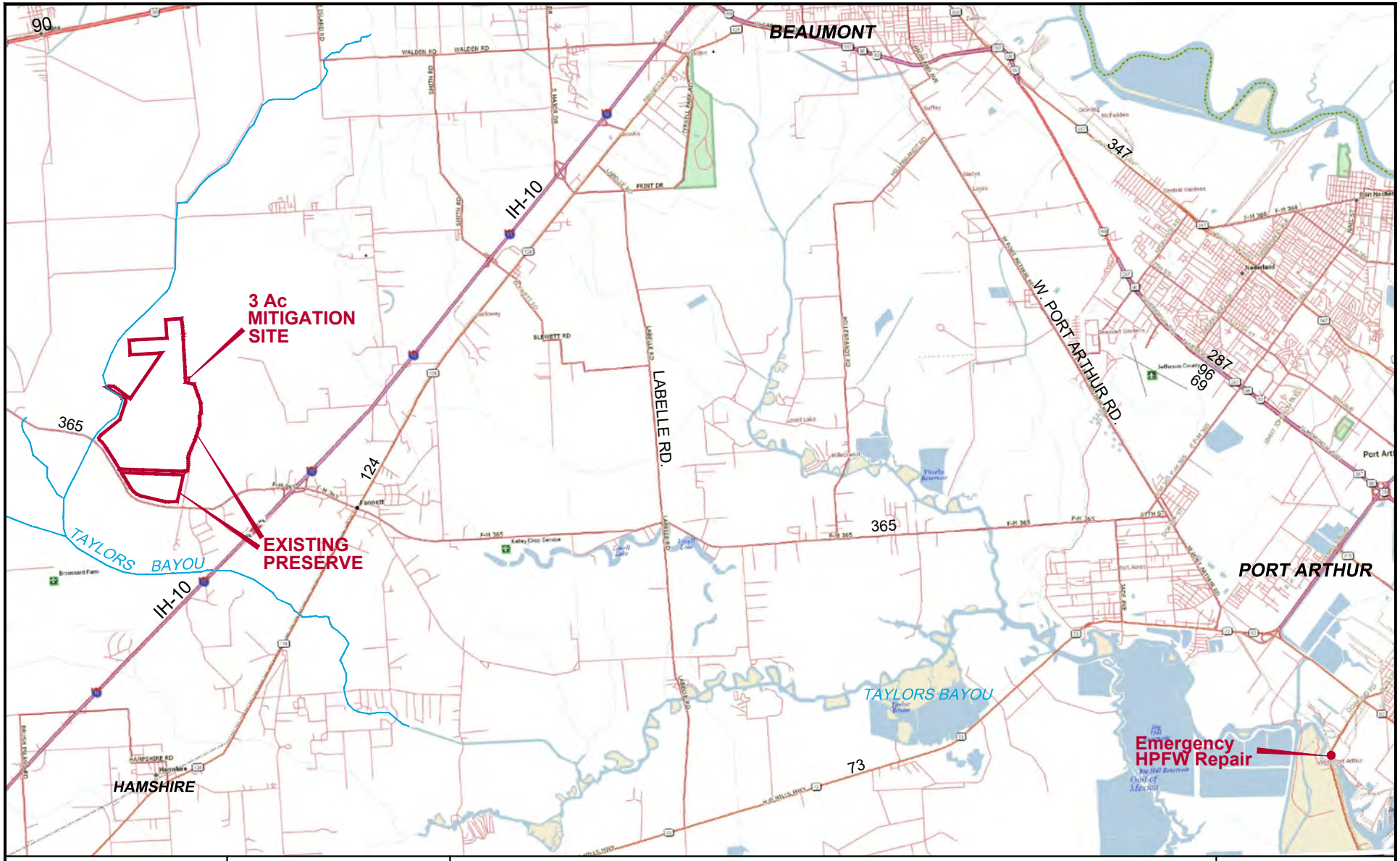
Typical Section View
Hurricane Protection Flood Wall Repair
Port Arthur, Jefferson County, Texas

APPENDIX B

MITIGATION DRAWINGS

"Do Not Scale This Drawing"

180025PA_06A_Vicinity.dwg | GLS | 03/26/2018



Horizon Environmental Services, Inc.

Date:	03/26/2018
Drawn:	GLS
HJN NO:	180025 PA
Source:	Delorme Street Atlas USA 2007

FIGURE 1

Mitigation Vicinity Map
Hurricane Protection Flood
Wall Repair
Port Arthur, Jefferson County, Texas

N

0 1.2 2.4
MILES

180025PA_07A_Mit Site.dwg | GLS | 03/26/2018

"Do Not Scale This Drawing"

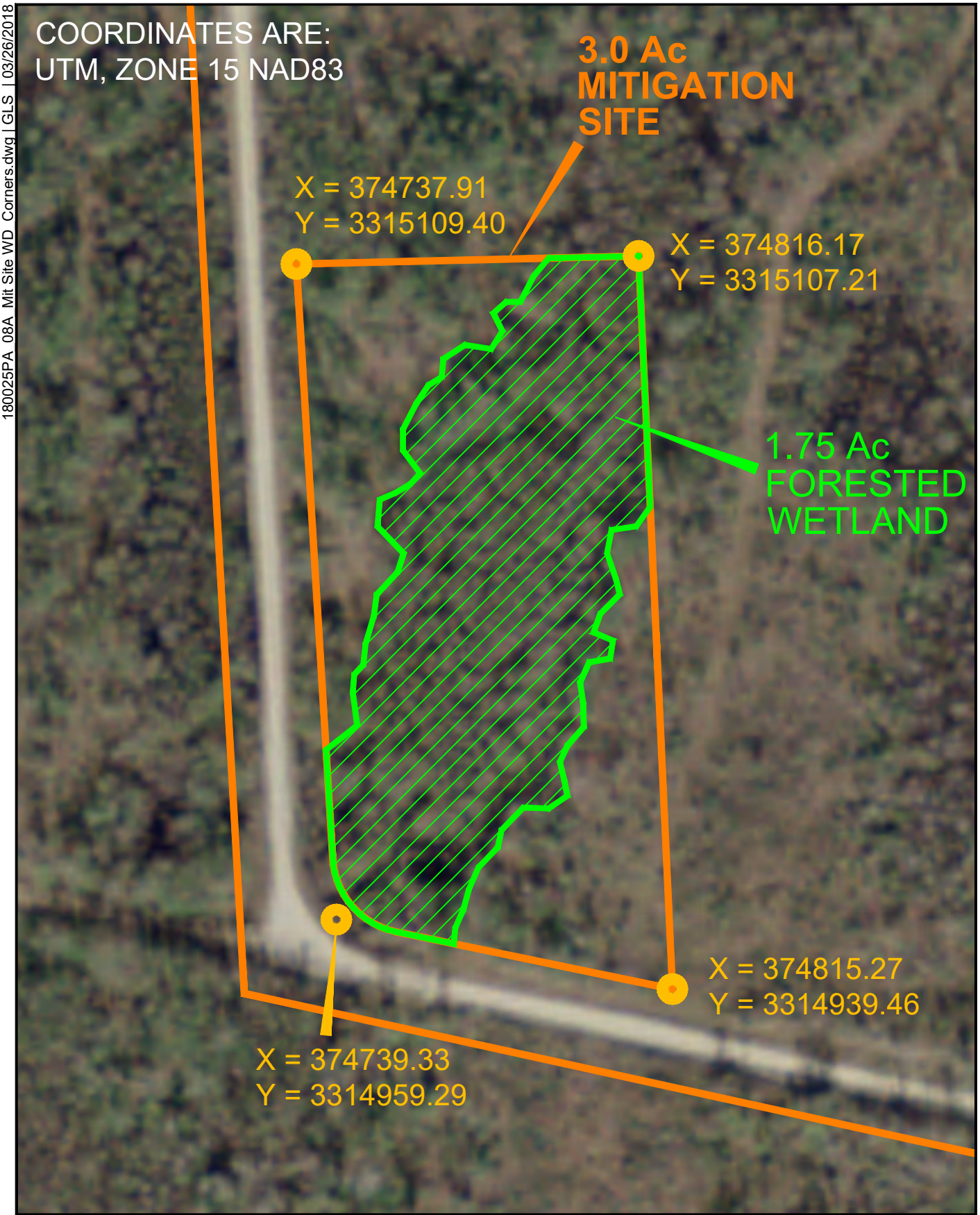
Horizon Environmental Services, Inc.

Date:	03/26/2018
Drawn:	GLS
HJN NO:	180025 PA
Source:	Client Provided

FIGURE 2
Proposed Mitigation Site
Hurricane Protection Flood
Wall Repair
Port Arthur, Jefferson County, Texas

N

0 1/4 1/2
MILES



180025PA_08A_Mit Site WD_Corners.dwg | GLS | 03/26/2018

"Do Not Scale This Drawing"

Horizon Environmental Services, Inc.

Date:	03/26/2018
Drawn:	GLS
HJN NO:	180025 PA
Source:	Client Provided

FIGURE 3
Proposed Mitigation Site
Hurricane Protection Flood
Wall Repair
Port Arthur, Jefferson County, Texas

N

0 50 100
FEET

APPENDIX C

PHOTOGRAPHS

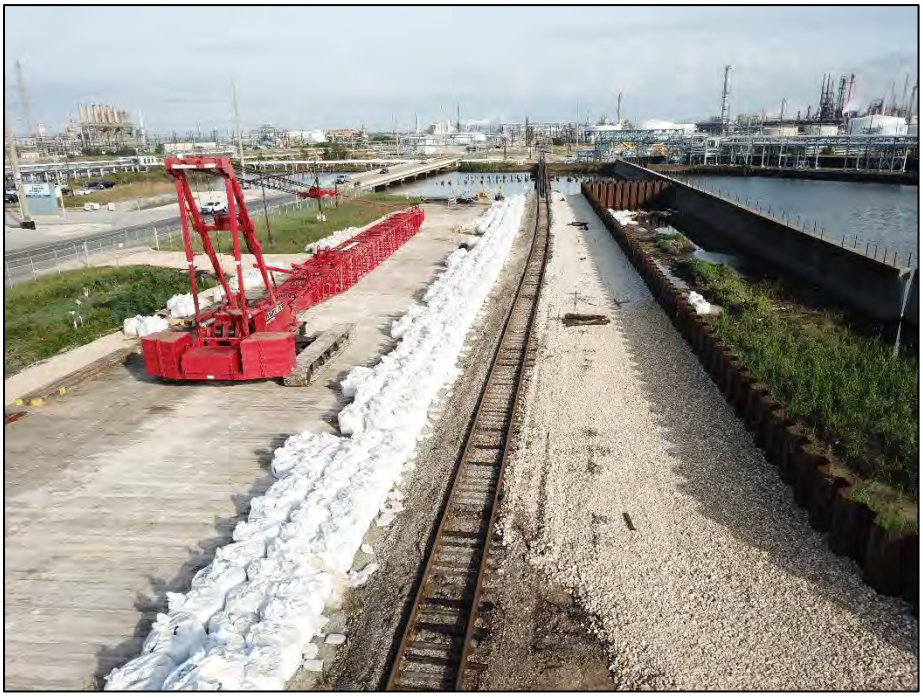


PHOTO 1
Existing Conditions

PHOTO 2
Remaining Tidal Marsh Looking North

PHOTO 3
Remaining Tidal Marsh Looking South

PHOTO 4
Water Front

PHOTO 5
Inside Sheet Pile Containment

PHOTO 6
Remaining Non-Tidal Wetland

PHOTO 7
Forested wetland in preserve site

PHOTO 8
Forested wetland in preserve site