APPENDIX H
CONCEPTUAL MITIGATION SUMMARY

May 16, 2019

DELTA LAND SERVICES

Mitigation Options

Bluewater Single Point Mooring (SPM) Project

BLUEWATER TEXAS TERMINAL, LLC

PREPARED BY:
Delta Land Services, LLC

PREPARED FOR:
Bluewater Texas Terminal, LLC

Bluewater Texas Terminal, LLC

Proposed Mitigation for Bluewater Single Point Mooring (SPM) Project

INTRODUCTION

The proposed conceptual mitigation solution would be a part of an effort to offset wetland impacts associated with the construction of Bluewater Texas Terminal's (BWTT) Deepwater Port facility and its associated pipeline and booster station in Aransas Bay Watershed. The subsequent mitigation solution and the impact site will be located in the United States Army Corps of Engineers (USACE), Galveston District (CESWG). Approximately 4.24 acres of wetlands will be impacted through habitat conversion, of which 1.35 acres consist of tidally influenced wetlands (mangroves). It is anticipated that the 4.24 acres of impacts will require compensatory mitigation (see below table for a breakdown of impact acres by habitat type).

Impact Acres by Habitat Type

Habitat Type Impacted	Acreage
Palustrine Scrub Shrub (PSS)	2.89
E2SS (Mangrove)	1.35
Total	**4.24**

Delta Land Services, LLC (Delta) would serve as the mitigation agent and implement the proposed mitigation solution. The following plan is conceptual and does not contain the required 12 components for a permittee responsible mitigation (PRM) plan, as outlined by the 2008 Mitigation Rule. Additionally, while extensive data and knowledge have been gathered at the proposed PSS mitigation site, no field data has been collected at the proposed black mangrove (*Avicennia germinans*) restoration areas.

POTENTIAL MITIGATION OPTIONS

BWTT proposes to offset PSS impacts with a PRM solution at Coastal Bays Bends and Estuary Program's (CBBEP) and Delta's Nueces Bend PRM Area (PRMA), located within the Lower Nueces Watershed (Figure 1). CBBEP serves as the landowner and would serve as the long-term steward of the PRMA; and Delta would implement the restoration efforts and monitor the site until long-term success criteria have been achieved. While this PRMA is not located within the impacted watersheds, BWTT feels this site is suitable provided the lack of mitigation land in Hydrologic Unit Codes (HUCs) 12110202, 12110201, and 12100405 and considering its geographical location near the confluence with the North Corpus Christi Bay Watershed. The Nueces River is the major freshwater input into the Corpus Christi Bay System, which is connected to the Aransas Bay system, where the Project impacts are located.

Based on the wetland delineation provided, it appears the mangrove impacts occur primarily along State Highway (SH) 361 and appear to be on state-owned submerged water bottoms (GLO). BWTT proposes to use this same general area for mangrove restoration (Figure 2). BWTT has identified this area because of the existing mangrove populations and the areas along SH 361 are submerged lands. Mangrove restoration can be controversial along the Texas coast because of its opportunistic nature and rapid

colonization of saltmarshes creating a monoculture of mangrove habitat outcompeting herbaceous marsh plant species. Utilizing the SH 361 corridor would limit the potential for mangrove to colonize existing marshes. Additionally, BWTT initially proposes to restore the impacted mangrove areas within the Project footprint.

Proposed PSS Mitigation (*Nueces Bend Permittee-Responsible Mitigation Area*)

BWTT proposes a simple offset ratio method of 3.0:1.0 (mitigation: impact) for offsetting PSS impacts at the PRMA. The restoration of PSS or wet coastal saline prairie at the Nueces Bend PRMA will be done through a combination of re-establishment and/or enhancement. As a result, BWTT proposes to restore approximately 9.0 acres of PSS or coastal prairie wetlands at the PRMA in order to appropriately offset impacts at an approximate 3.0:1.0 ratio. While the inland impacts are to PSS wetlands, BWTT's preferred option is restoring all or part of the PRMA as coastal wet prairie. Coastal prairie habitat is a diminishing resource along the gulf coast, with less than 10% estimated to remain along the Texas coast. In comparison to coastal prairie, PSS wetlands are expanding in this region due to the lack of fire and other methods of woody species control. Therefore, given the diminishing resource of coastal prairie combined with the expanding PSS wetlands in the region, wet coastal prairie restoration, rather than PSS restoration, would suitably address the needs of the watershed as well as meet and maintain compliance with the watershed approach. If throughout the permit process, a PSS solution becomes the preferred approach, BWTT has the flexibility to restore native shrub wetlands along the Nueces River within the PRMA.

The PRMA is located approximately 7.0 miles north of the city of Robstown in Nueces County, Texas and approximately 1.7 miles south-southeast of the intersection of Interstate Highway 37 and U.S. Highway 77 (Figure 1). The approximate center of the mitigation tract is latitude 27.887191˚ North and longitude 97.613207˚ West (North American Datum of 1983 [NAD83]). The PRMA is located in the Lower Nueces Subbasin (HUC 12110111) near the confluence of numerous other watersheds, which are connected to the impact watershed (Figure 1). The PRMA will become part of the CBBEP's existing 10,000+-acre Nueces Delta Preserve.

Watershed Contributions

The Nueces Delta has experienced changes in water use (i.e., Calallen Saltwater Barrier, Lake Corpus Christi Reservoir and Choke Canyon Reservoir; Montagna et al. 2011). Additionally, agricultural use, industrial development, and residential growth in close proximity to the Corpus Christi Bay Complex has negatively affected the productivity of coastal prairie uplands and wetlands, coastal marshes, and estuaries (Montagna et al. 2011). Once the mitigation area is restored, it will become a functional portion of the Nueces Delta ecosystem and managed under the Nueces Estuary Ecosystem Management Initiative and by the Coastal Bends and Bays Estuary Program (CBBEP 2014; Montagna et al. 2011). Current wetland functions at one or both locations are limited by the following factors:

- agricultural improvements (historic drainage improvements and annual / bi-annual tilling);
- recreational all-terrain vehicles;
- lack of a native, perennial herbaceous ecosystem; and
- encroachment by invasive hardwoods (i.e., *Acacia farnesiana* and *Prosopis glandulosa*).

Coastal Prairie Restoration Option

If coastal prairie restoration is the preferred mitigation approach, the PRMA will restore approximately 9.0 acres of salty prairie PEM (Figure 3). The construction and establishment work required for long-term success of the PRMA will be extensive during the construction phase and prove successful in the interim and long-term phases. In comparison to similar geomorphic positions within the Nueces River Delta, surface hydrology reconditioning and native plant community plantings will be required to restore the appropriate wetland hydrology, soil, and plant communities of a coastal salty prairie wetland. Furthermore, the existence of these self-sustaining salty prairie ecosystems at similar geomorphic positions indicates a high potential for the successful restoration of the proposed PRMA. Restoration activities will include the cessation of agricultural and ATV uses, hydrologic site restoration, native ecotype plantings (i.e., *Spartina spartinae* and *Borrichia frutescens*), and invasive woody species control (i.e., *Acacia farnesiana*, *Prosopis glandulosa*, and *Retama sphaerocarpa*).

Sustainable wetland hydrology will be restored on the PRMA to re-establish sheet flow, increase surface water retention, and re-establish ephemeral connections to the Nueces River. Areas that have exhibited high amounts of ATV disturbance will be returned to natural elevations to allow for the natural flow of stormwater across the site.

Invasive woody species will be controlled by using established mechnical means, herbicide applications, and prescribed fire. A pro-active invasive species treatment program will begin prior to planting preparation and continue as part of the long-term maintenance program (e.g., spot treating). The re-establishment of a predominantly *Spartina spartinae* / *Borrichia frutescens* dominated ecosystem will provide sufficient fuels to control invasive woody species. Summer / fall prescribed burns will occur in conjunction with the burning schedule of the CBBEP. The rotational prescribed fire program will reduce woody encrouchment, mineralize nutrients, and sustain a native fire tolerant community. As the ecosystem matures, perennial herbaceous species will dominate the PRMA.

PSS Restoration Option

If BWTT chooses to restore PSS wetlands at the PRMA, the restoration would occur along the Nueces River where shrub habitat historically occurred in the region (Figure 3). Similar to the coastal prairie restoration, hydrological restoration would include the cessation of ATV use and restoration of natural contours that have been damaged through by off-road vehicle use. Plant restoration would consist of controlling non-native herbaceous species and controlling native invasive woody species such as *Acacia farnesiana* while establishing a native shrub community of *Parkinsonia aculeata*, sapling size *Ulmus crassifolia*, and *Sesbania* spp.

Invasive woody species will be controlled by using established mechnical means and herbicide applications. A pro-active invasive species treatment program will begin prior to planting preparation and continue as part of the long-term maintenance program (e.g., spot treating).

<u>Proposed Mangrove Restoration</u>

Mangrove restoration would consist of achieving target elevation and planting of mangrove seedlings. Prior to any restoration work, BWTT would coordinate a lease with GLO and provide the agency with a restoration plan for their review and approval. Coordination would begin at the regional GLO office and

then final review and drafting of the lease would occur in their Austin office. During development of the plan, reference target elevations would be obtained from established mangrove areas along SH 361. BWTT would then either identify areas of similar elevation lacking mangrove and plant those areas or cut/fill an area to target elevation and then plant the restored area. However, BWTT's preferred approach would be to re-establish mangroves in the areas of impact since these areas will not be filled and mangrove is already established.

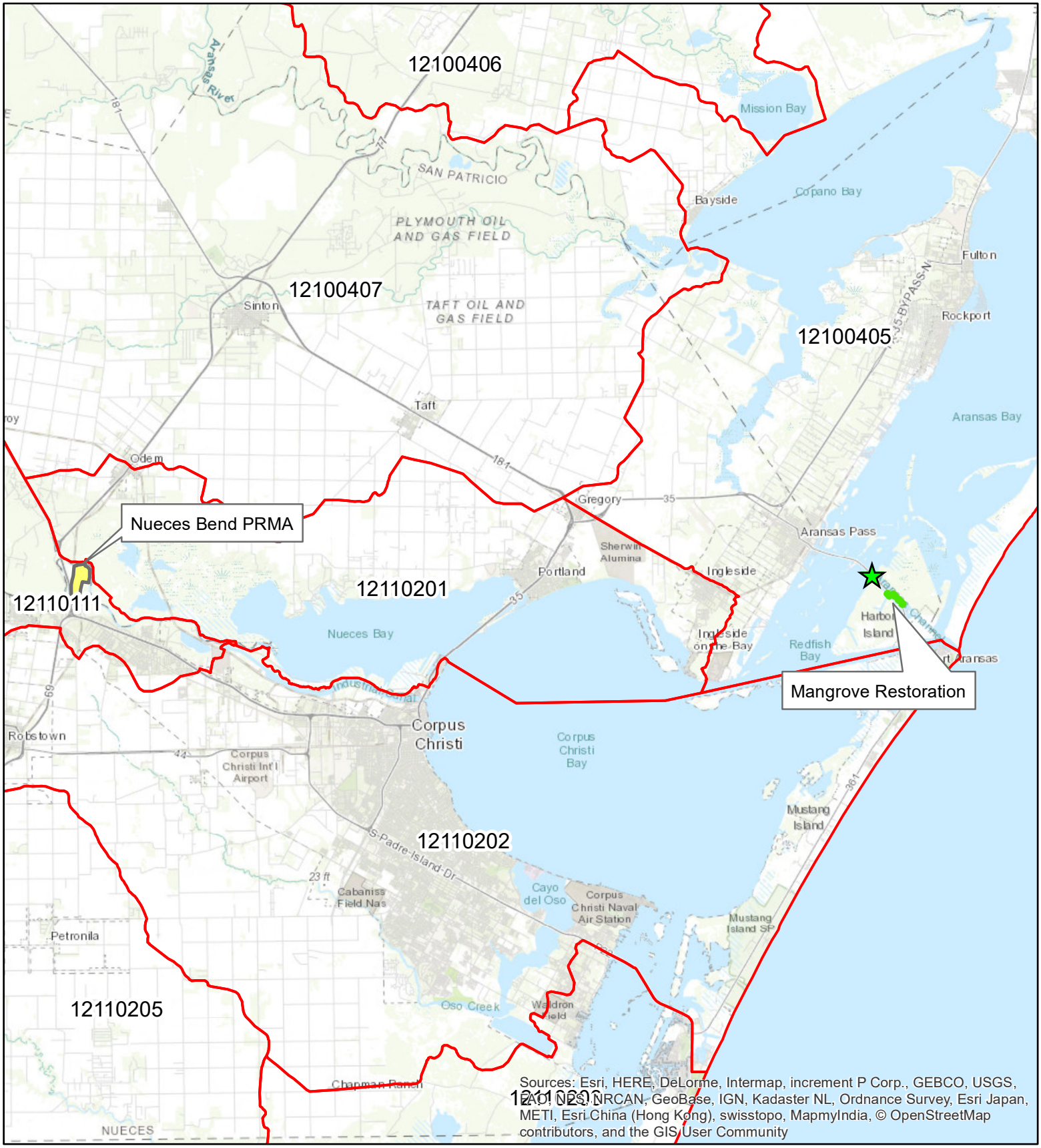
CONCLUSION

The conceptual plan described above would offset the lost functions caused by the removal of shrub habitat during construction. BWTT will develop a complete mitigation plan further in the permitting review process. Within the future mitigation plan, success criteria and an adaptive management plan will be established; these will be consistent with previous CESWG approved mitigation sites. Additionally, short and long-term financial assurances will be established for management of the restoration areas.

References

Coastal Bend Bays & Estuaries Program (CBBEP) (2014) *Nueces Delta Preserve: Conceptual Master Plan*. Accessed 05/22/2019. http://www.cbbep.org/graphics/NDPConceptualMasterPlan.pdf

Montagna P.A., Hutchison, L.M., D. Scholz, T. Palmer, S. Arismendez, and D. Yoskowitz. 2011. *Nueces Estuary Ecosystem Management Initiative: An Ecosystem Services-based Plan*. Final Report submitted to the Coastal Bend Bays & Estuaries Program for project number 1018. Texas A&M University - Corpus Christi, Harte Research Institute for Gulf of Mexico Studies, 170 pp.



8-digit HUCs or Watersheds

Project Location

Nueces Bend PRMA

Conceptual Mangrove Restoration Areas

25,000 12,500 0 25,000

Feet

Bluewater SMP Project

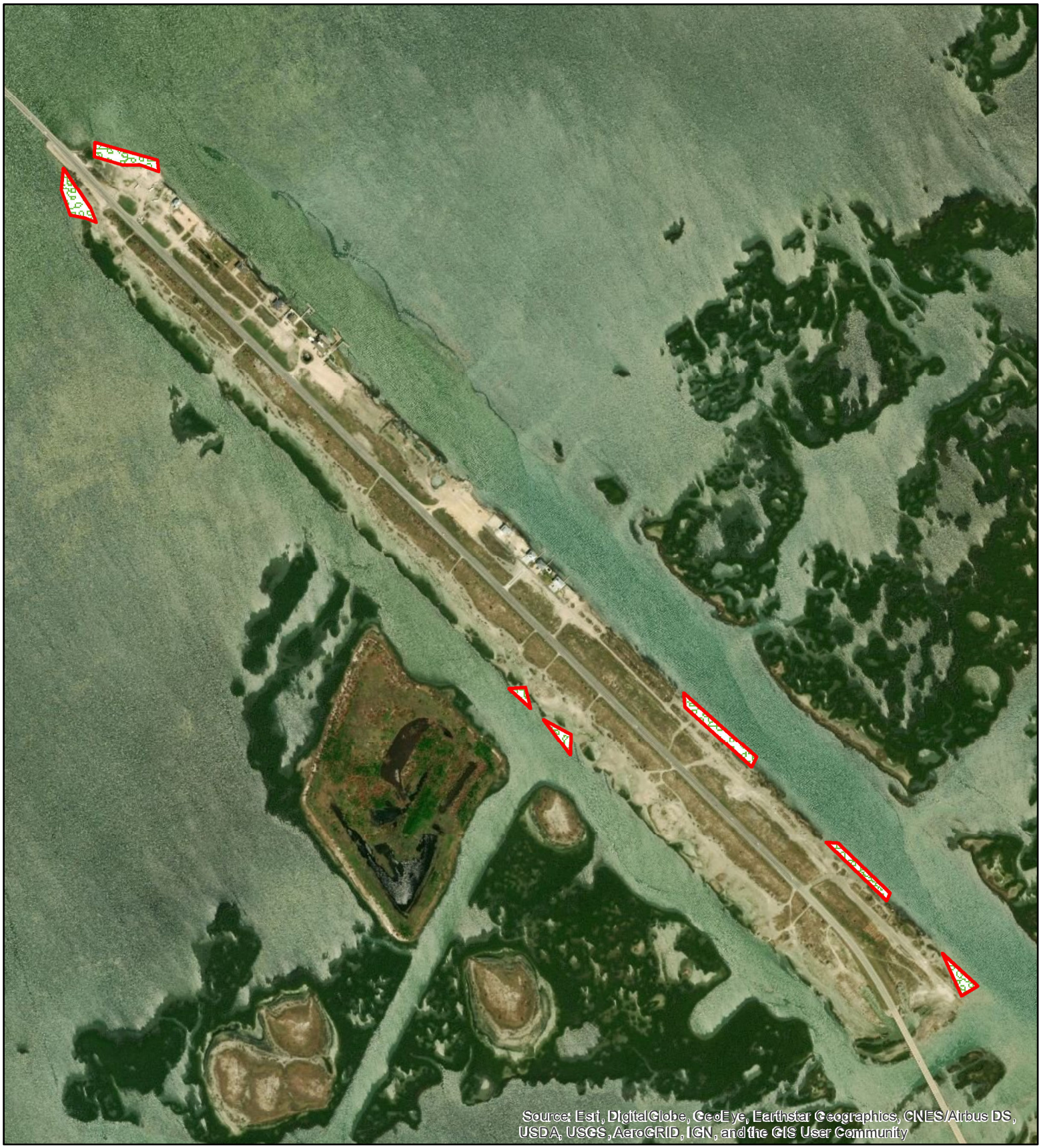
Vicinity Map

ARANSAS COUNTY, TEXAS

Created :	DRP/AM10.5
Approved :	CB
Date :	5/14/2019
Map No. :	F01_Vicinity

DELTA LAND SERVICES

FIGURE 1



Conceptual Mangrove Restoration Areas

1,000 500 0 1,000

Feet

Bluewater SMP Project

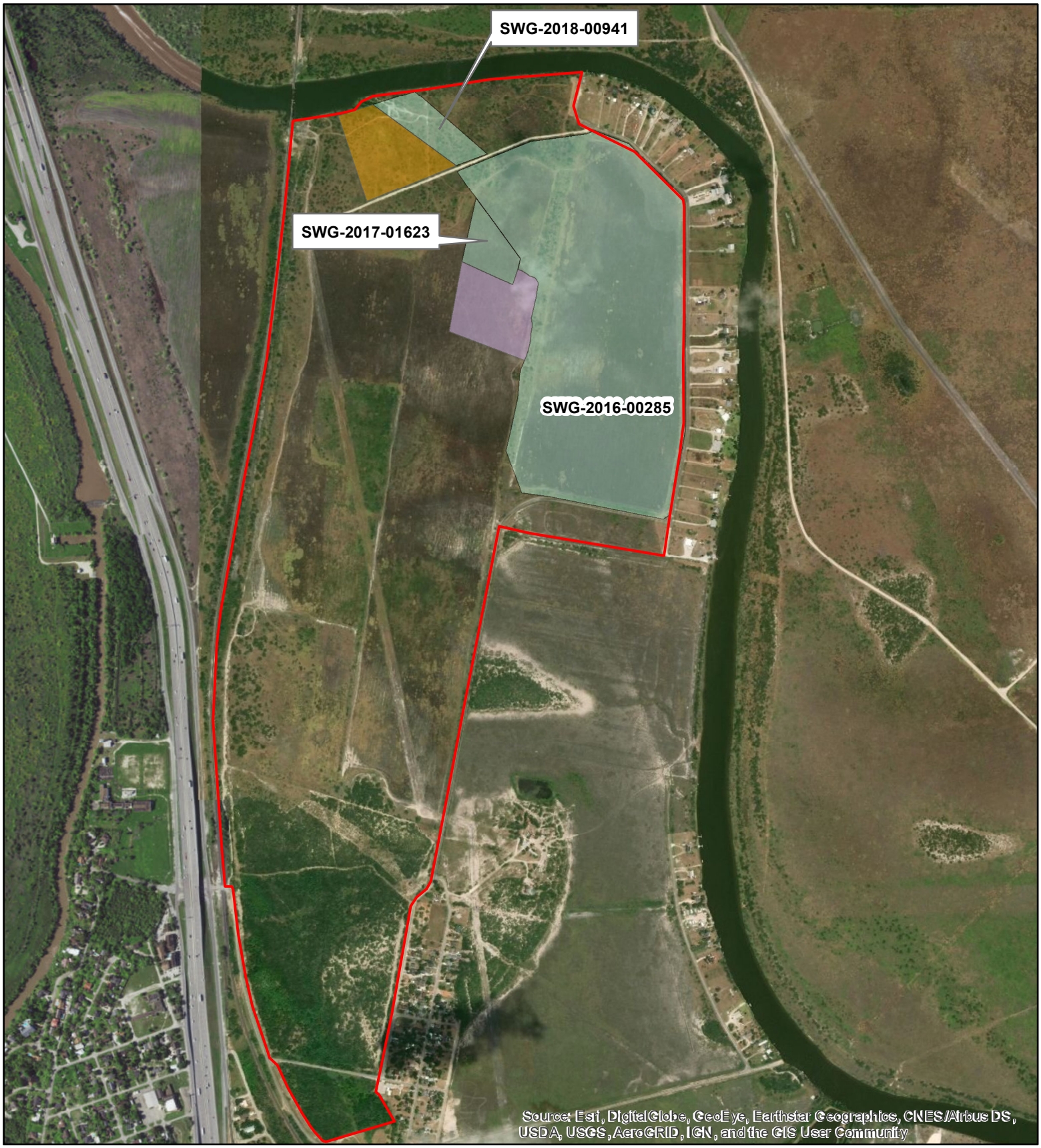
Conceptual Mangrove Restoration

ARANSAS COUNTY, TEXAS

Created :	DRP/AM10.5
Approved :	CB
Date :	5/14/2019
Map No. :	F02_Mangrove

DELTA LAND SERVICES

FIGURE 2



Nueces Bend PRMA (455.8 ac)

Proposed PSS Restoration (9.0 ac)

Proposed Saline Coastal Prairie Restoration (9.0 ac)

Existing Approved PRMs

800 400 0 800

Feet

Bluewater SMP Project

Nueces Bend PRMA

NUECES COUNTY, TEXAS

Created :	DRP/AM10.5
Approved :	CB
Date :	5/14/2019
Map No. :	F02_Nueces PRMA

DELTA LAND SERVICES

FIGURE 2