Notes:

Data Sources:
ESRI World Imagery
9/20/2020

Legend

Project Study Area (269.4 Acres)

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
HI-E - FIGURE 1-1.3

Site HI-E Overview Map
Aransas & Nueces County, TX

900 0 900 1,800 Feet

N W E S

ABSOLUTE SCALE:
1:10,800

REFERENCE SCALE:
1 IN = 900 FT

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

Drawn By: CLB
Date: 07/06/2021

Notes:

Data Sources:
ESRI World Imagery
9/20/2020

Legend

Project Study Area (250.6 Acres)

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
SS2 - FIGURE 1-1.3

Site SS2 Overview Map
Nueces County, TX

700 0 700 1,400 Feet

N W E S

ABSOLUTE SCALE:
1:8,400

REFERENCE SCALE:
1 IN = 700 FT

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

Drawn By: CLB
Date: 07/06/2021

Notes:

Data Sources:
ESRI World Imagery
9/20/2020

Legend

Project Study Area (590 Acres)

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
SS1 - FIGURE 1-1.3

Site SS1 Overview Map
Nueces County, TX

1,200 0 1,200 2,400 Feet

N W E S

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

ABSOLUTE SCALE:
1:14,400

REFERENCE SCALE:
1 IN = 1,200 FT

Drawn By: CLB
Date: 07/06/2021

Notes:

Data Sources:
ESRI World Imagery
9/20/2020

Legend

Project Study Area (294.1 Acres)

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
PA4 - FIGURE 1-1.3

Site PA4 Overview Map
Nueces County, TX

800 0 800 1,600 Feet

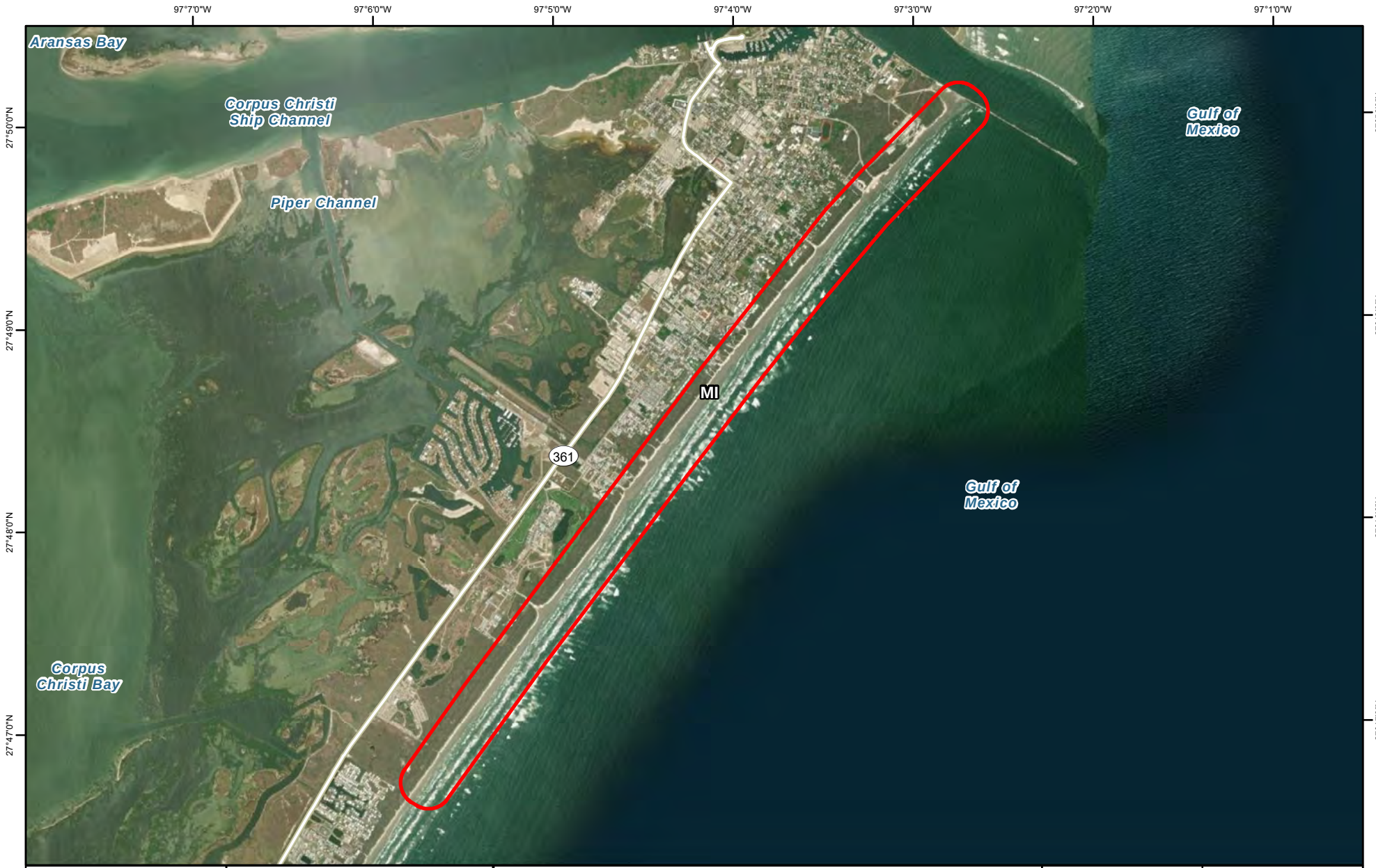
N W E S

ABSOLUTE SCALE:
1:9,600

REFERENCE SCALE:
1 IN = 800 FT

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

Drawn By: CLB
Date: 07/06/2021



Notes:

Data Sources:
ESRI World Imagery
9/20/2020

Legend

Project Study Area (986 Acres)

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
MI - FIGURE 1-1.3

Site MI Overview Map
Nueces County, TX

4,000 0 4,000 8,000 Feet

N W E S

ABSOLUTE SCALE:
1:48,000

REFERENCE SCALE:
1 IN = 4,000 FT

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

Drawn By: CLB
Date: 07/06/2021

2 Regulatory Authority

2.1 Regulatory Overview

This report presents the findings from field surveys to identify and delineate potential WOUS, including wetlands and SAV, which could be considered jurisdictional by USACE. While this report identifies the boundaries of potential jurisdictional features, USACE is the only entity that can verify the jurisdictional boundaries and issue an Approved Jurisdictional Determination (AJD). Jurisdictional WOUS and wetlands are regulated under Section 10 of the RHA of 1899 and/or Section 404 of the CWA. The United States Environmental Protection Agency (EPA) published the Final Navigable Waters Protection Rule (NWPR) on April 21, 2020 under 33 CFR 328.3. Jurisdictional WOUS and wetlands, as defined by the Final NWPR include:

(1) The territorial seas, and waters which are currently used, or were used in the past, or may be susceptible to use in the interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
(2) Tributaries;
(3) Lakes and ponds, and impoundments of jurisdictional waters; and
(4) Adjacent wetlands

According to 33 CFR 328.3(c)(1), adjacent wetlands mean wetlands that:

(1) Abut, meaning to touch at least at one point or side of, a water identified in (1), (2), or (3) above;
(2) Are inundated by flooding from a water identified in (1), (2), or (3) above in a typical year;
(3) Are physically separated from a water identified in (1), (2), or (3) above by a natural berm, bank, dune, or similar natural feature; or
(4) Are physically separated from a water identified in (1), (2), or (3) above only by an artificial dike, barrier, or similar artificial structure so long as that structure allows for a direct hydrologic surface connection between the wetlands and the water identified in (1), (2), or (3) above in a typical year, such as through a culvert, flood or tide gate, pump, or similar artificial feature. An adjacent wetland is jurisdictional in its entirety when a road or similar artificial structure divides the wetland, as long as the structure allows for a direct hydrologic surface connection through or over that structure in a typical year.

Under Section 10 of the RHA, the USACE regulates excavation, installation of structures, and the discharge of dredged material within WOUS below the Mean High Water (MHW) line elevation of tidal waters or the ordinary high-water mark (OHWM) elevation of non-tidal waters. Section 10 of the RHA defines jurisdictional waters as all waters which are currently used, or were used in the past, or may be susceptible to future use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.

Under Section 404 of the CWA, the USACE regulates the discharge of fill material into all jurisdictional WOUS and wetlands, including waters below the MHW line or OHWM. As per the Final Navigable Protection Rule, the CWA defines jurisdictional waters to include navigable waters, tributaries, lakes and ponds, and impoundments of jurisdictional waters, and adjacent wetlands. Section 404 of the CWA defines the landward limit of jurisdiction as the High Tide Line (HTL) line elevation in tidal waters and the OHWM elevation in non-tidal waters; however, when adjacent wetlands are present, the limit of jurisdiction extends to the limit of the wetland boundary. Adjacent wetlands are those located above the HTL or OHWM, that meet the criteria of an adjacent wetland as defined under 33 CFR 328.3(c)(1). The 1987 USACE Wetlands Delineation Manual (Manual) defines wetlands as areas that have positive indicators for dominant hydrophytic vegetation, wetland hydrology, and hydric soils or as “areas that are inundated or saturated by surface water or groundwater 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, “with special exemptions”.

3 Methods

3.1 Field Investigation Methods

The following sections describe the field methods used to identify and delineate WOUS, wetlands, and SAV within the five PSAs.

3.1.1 Field Survey Methods for Delineation of WOUS (Tidal Boundary Survey)

Prior to conducting field work, a waters and wetlands delineation survey workplan was developed for the five PSAs (Appendix B). A sixth BU site, San Jose Island (SJI) is included as part of the attached survey workplan, but due to landowner and schedule constraints, will be surveyed at a later date and included as an addendum to this report. The survey workplan was reviewed and approved by the PCCA and the USACE Project Manager prior to initiating field work. In order to delineate WOUS, positional locations of the MHW and HTL tidal elevation lines, were recorded by Triton Environmental Solutions, LLC (Triton) along the shorelines of each of the five PSAs. For each of the five PSAs, the MHW elevation is determined to be +1.01 feet NAVD88 and the HTL is determined to be +2.76 feet NAVD88. A Triton biologist surveyed the shoreline at discrete point locations to locate the MHW and HTL elevations using a Trimble R8 Real-Time Kinematic (RTK), sub-centimeter hand-held global positioning (GPS) unit. The R8 RTK unit receives real-time sub-centimeter corrections from the Virtual Reference Station (VRS) network to record accurate (i.e., sub-centimeter accuracy) elevations. Once the tidal boundary field survey was complete, positional and elevation data for MHW and HTL tidal boundaries were post-processed in the office and overlaid onto recent aerial imagery.

Non-tidal waterbodies were delineated using visual identification of the OHWM along the waterbody shoreline. The OHWM was visually identified using physical characteristics such a natural impressed bank and shelving, without utilizing a specific elevation. A Mott MacDonald biologist surveyed non-tidal waterbody shorelines at discrete point locations using a GeoXH 6000 Series, sub-meter hand-held GPS unit. Once the field survey was complete, positional data for OHWM boundaries was post-processed in the office and overlaid onto recent aerial imagery.

3.1.2 Field Survey Methods for Delineation of Wetlands

Prior to conducting field work, a waters and wetlands delineation survey workplan was developed for the five PSAs (Appendix B). A sixth BU site, San Jose Island (SJI) is included as part of the attached survey workplan, but due to landowner and schedule constraints, will be surveyed at a later date and included as an addendum to this report. The survey workplan was reviewed and approved by the PCCA and the USACE Project Manager prior to initiating field work. The wetlands delineation was conducted by Mott MacDonald in accordance with the USACE *Corps of Engineers Wetlands Delineation Manual* (USACE, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0)* (USACE, 2010). Wetlands and waterbodies were classified in the field using the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979). Wetland indicator classification for vegetation identified to the species level were recorded based on the *National Wetland Plant List: 2016* (Lichvar et al., 2016).

Hydrology, soils, and vegetation were examined within the five PSAs at discreet sampling locations located along transects and within different vegetation communities observed in the field. Sampling locations and aquatic resource boundaries were delineated in the field by recording positional locations using six separate GeoXH 6000 Series, sub-meter hand-held GPS units. As directed by PCCA, the waters and wetlands delineation survey was only conducted to

the PSA boundaries and did not extend onto private property, even if the wetland extended beyond the PSA boundaries.

During the wetland field evaluation at each of the five PSAs, detailed information at sample locations (typically configured as a 30-foot radius circle for all vegetation types) was recorded in each representative vegetation types that occur along the transects identified in the survey workplan. At sample locations, a USACE Routine Wetland Determination Data Form for the Atlantic and Gulf Coastal Plain Region was completed. These sample locations are considered the Wetland Determination (WD) sample plot type and the Upland Determination (UD) sample plot type for this report. For each wetland identified, the boundary was determined and positions recorded in the field using the Wetland Flagging (WF) GPS plot type. Field notes were recorded for each sample location within a Rite-in-the-Rain® field logbook. USACE Wetland Determination Data Forms completed at WD and UD plot locations are provided in Appendix C. Site photos taken at sample locations are included in this report as Appendix D.

3.1.3 Field Survey Methods for Delineation of SAV and Oyster Habitat

An aquatic resources survey, including the delineation of SAV and oyster habitat, was conducted at the five PSAs by Triton biologists from April 27 through May 27, 2021. A description of field survey methods for the aquatic resources survey are detailed in Triton's Aquatic Resources Field Survey Plan and Aquatic Resources Report included in Appendix E.

3.2 Evaluation of Existing Information Methods

Prior to conducting the field delineation surveys, existing data was acquired and reviewed by Mott MacDonald in order to identify, describe, and document the physical setting and various habitat types within the five PSAs and to assist in identifying potential locations of waters, wetlands, SAV, and oysters. Background information compiled and reviewed included historical and recent aerial imagery, topography, soils, NWI-mapped wetlands, USGS NHD-mapped streams and waterbodies, Federal Emergency Management Agency (FEMA) mapped flood zones, LiDAR elevation and bathymetric depth data, and TPWD mapped EMST habitats. Results of existing data evaluations are described in Sections 3.2.1 through 3.2.7.

3.2.1 Historical and Recent Aerial Imagery

Aerial imagery, both recent and historical, was obtained from Google Earth Pro, ArcGIS World Imagery Layer, and the National Agriculture Imagery Program (NAIP), with the earliest aerial imagery of the five PSAs acquired in December 1956 (Google Earth) and the most recent imagery acquired in December 2020 (Google Earth). The 1956 imagery reveals that the HI-E, SS2, SS1, and PA4 PSAs were chains of spoil islands that had not yet been manipulated or altered for the placement of dredged material. The CCSC, Aransas Channel, and Lydia Ann Channel are present in the 1956 photograph. Areas of vegetation are present on the spoil islands in 1956, along with shallow water inlets, algal flats, sand flats, and large patches of SAV. Beginning in the 1970s, as is shown in the 1979 photograph (Google Earth), the HI-E and PA4 PSAs appear to be manipulated and altered, including the presence of levees and confined areas to accept the placement of dredged material. The placement of dredged material within the HI-E and PA4 PSAs continue to occur over time as is seen in the 1985, 1995, 2005, 2016, and 2020 photographs (Google Earth).

According to historical photographs dated 1956, 1979, 1990, 2003, and 2016, the SS2 and SS1 PSAs appear to remain more naturalized and less altered over time. Piper channel was dredged in the 1970s just west of the SS2 PSA for boat access to the Island Moorings residential canal subdivision in Port Aransas. In addition, a linear borrow pit was excavated within the interior of

the SS2 PSA sometime after 1956. A natural shoreline was present along the SS2 PSA until 2008, when the shoreline was stabilized with an armored stone revetment. Hurricane Harvey, which occurred in 2017, caused two large breaches in the stone revetment and allowed tidal water from the CCSC to reach the interior of the SS2 PSA. The SS1 PSA appears to accrete and lose land surface area over time as is shown in photographs dated 1956 (accretion), 1979 (loss), 1985 (loss), 1990 (accretion), 2003 (accretion), 2005 (loss), 2009 (accretion), 2014 (accretion), 2020 (loss) (Google Earth). The SS1 PSA is currently undergoing significant erosion due to larger and increased vessel traffic within the CCSC.

The MI PSA appears to be a natural barrier island in the 1956 photograph, with little residential or commercial development present behind the dunes or on the gulf beach. Vegetation is present behind the primary dunes. Roadways can be seen traversing the dunes within the 1956 photograph, with roads and development increasing over time through present day.

NAIP orthorectified aerial imagery (both true-color and color-infrared) is available for the five PSAs at resolutions of 1.0- and 2.0-m^2. NAIP imagery was acquired from 2006 (true-color) for the five PSAs. The ortho-rectified imagery may be viewed and interpreted using ArcGIS software. NAIP is made available to the public by the USDA NRCS Geospatial Data Gateway at https://datagateway.nrcs.usda.gov/.

Recent true-color orthorectified aerial imagery is available for the five PSAs at a resolution of 0.5-m^2, acquired in 2020. This imagery was acquired by the Maxar satellite system (formerly known as DigitalGlobe) and made available to the public through the World Imagery Layer viewed in ArcGIS software. This imagery, along with Google Earth imagery from August 2020, was used as the mapping base to complete the delineation of WOUS, wetlands and SAV communities within the five PSAs. Table 3.2-1 summarizes the digital aerial imagery available for the PSAs.

Table 3.2-1: Aerial Imagery Source and Acquisition Years for the Five Project Study Areas

Source	Acquisition Years	Type
Google Earth	1956, 1979, 1985, 1990, 1995	Black and white
Google Earth	2003, 2005, 2006, 2008, 2009, 2010, 2011, 2013, 2014, 2016, 2017, 2020	True-color
NAIP	2002, 2005, 2006, 2008	Color infrared, true-color
ArcGIS	2020	True-color

3.2.2 NRCS Soil Survey Geographic (SSURGO) Database

The Soil Survey Geographic (SSURGO) database is a digitized soil mapping GIS dataset developed and maintained by the USDA NRCS. Mapping scales generally range from 1:12,000 to 1:24,000. The SSURGO dataset are digitized duplicates of the original soil survey maps and, therefore, are the most detailed level of soil mapping performed by the NRCS. SSURGO is linked to a National Soil Information System (NASIS) attribute database which provides the proportionate extent of component soils and their properties for each map unit. Map units for the SSURGO database consist of one to three components each. Attribute data in the NASIS database apply to the principal component in each soil mapping unit and were used to identify the five PSA soil units including attributes classifying hydric condition and drainage class. Minor components may have hydric conditions or drainage classes that differ from the primary component soils. Table 3.2-2 summarizes the soils mapped by NRCS within the five PSAs. A map series showing locations of soils within the PSAs is included as Figure 2 Map Series, Appendix A.

Table 3.2-2: NRCS Mapped Soils within the Five Project Study Areas

PSA	Soil Code	Soil Name	Drainage Class	Hydric	Area (ac)
HI-E	BT	Barrada-Tatton association, 0 to 1 percent slopes, occasionally ponded	Very poorly drained	Yes	31.8
	By	Beaches	Very poorly drained	Yes	2.6
	Is	Ijam soils, rarely flooded	Poorly drained	Yes	45.2
	Ma	Ijam clay loam, rarely flooded	Poorly drained	Yes	42.4
	Mu	Mustang Fine Sand, 0 to 1 percent slopes, occasionally flooded, frequently ponded	Poorly drained	Yes	0.5
	Sb	Twinpalms occasionally flooded-Yarborough frequently flooded complex, 0 to 3 percent slopes	Somewhat poorly drained	Yes	3.2
	Ta	Tidal flats, occasionally ponded	Very poorly drained	No	73.5
	W	Water	N/A	Yes	70.2
				TOTAL	**269.4**
SS2	Sb	Twinpalms occasionally flooded-Yarborough frequently flooded complex, 0 to 3 percent slopes	Somewhat poorly drained	Yes	83.6
	Ta	Tidal flats, occasionally ponded	Very poorly drained	No	116.4
	W	Water	N/A	Yes	50.6
				TOTAL	**250.6**
SS1	Sb	Twinpalms occasionally flooded-Yarborough frequently flooded complex, 0 to 3 percent slopes	Somewhat poorly drained	Yes	232.9
	Ta	Tidal flats, occasionally ponded	Very poorly drained	No	9.9
	W	Water	N/A	Yes	347.1
				TOTAL	**589.9**
PA4	Sb	Twinpalms occasionally flooded-Yarborough frequently flooded complex, 0 to 3 percent slopes	Somewhat poorly drained	Yes	85.2
	Ta	Tidal flats, occasionally ponded	Very poorly drained	No	137.8
	W	Water	N/A	Yes	71.1
				TOTAL	**294.1**
MI	Cs	Coastal dunes	Somewhat excessively drained	No	181.6
	Co	Coastal beach	Very poorly drained	No	249.0
	W	Water (includes unmapped open water)	N/A	Yes	333.9
				TOTAL	**764.5**

Note: Open water areas that are not mapped by NRCS have been included to represent full PSA acreages.

3.2.3 National Wetlands Inventory Mapping

The USFWS is the principal Federal agency that provides information to the public on the extent and status of the Nation's wetland and aquatic resources. The USFWS's NWI Program has developed a series of topical maps that show the extent and character of the Nation's wetlands and deepwater habitats. The NWI wetlands mapping is often available in two forms, non-digital hard-copy paper maps and digital geospatial data for use in GIS.

NWI mapping for the five PSAs is available to the public as a digital GIS data layer. The NWI mapped 10 resources within the HI-E PSA, 11 resources within the SS2 PSA, 18 resources within SS1 PSA, 18 resources within the PA4 PSA, and 8 resources within the MI PSA, with a total of 65 resources for all five PSAs. These include estuarine deepwater habitat, estuarine unconsolidated shore, estuarine emergent wetlands, estuarine aquatic beds, marine coastline wetlands, palustrine freshwater emergent wetlands, and palustrine freshwater ponds. Table 3.2-3 provides a summary of NWI mapping within the five PSAs. A map series showing locations of NWI-mapped wetlands within the PSAs is included as Figure 3 Map Series, Appendix A.

Table 3.2-3: NWI Wetlands within the Five Project Study Areas

PSA	Resource	NWI Classification	Number of Mapped Resources	Area (ac)
HI-E	Estuarine and Marine Deepwater and Wetland Habitats	E1AB3L	1	17.1
		E1UBLx	2	42.0
		E2SS3N	2	13.1
		E2USN	1	13.7
		E2USP	1	7.4
		E2USPs	2	38.1
		E1UBL	1	33.4
		TOTALS	**10**	**164.8**
SS2	Estuarine and Marine Deepwater and Wetland Habitats	E2EM1N	1	11.3
		E2EM1P	1	1.2
		E2USM	3	13.4
		E2USN	2	85.7
		E2USP	3	6.3
		E1UBL	1	50.7
		TOTALS	**11**	**168.6**
SS1	Estuarine and Marine Deepwater and Wetland Habitats	E1AB3L	1	190.2
		E1UBLx	1	2.6
		E2EM1N	6	22.3
		E2EM1P	1	0.9
		E2USN	2	51.5
		E2USP	6	90.0
		E1UBL	1	213.9
		TOTALS	**18**	**571.4**

PSA	Resource	NWI Classification	Number of Mapped Resources	Area (ac)
PA4	Estuarine and Marine Deepwater and Wetland Habitats	E1AB3L	1	25.0
		E1UBL	1	83.2
		E2EM1N	3	10.9
		E2EM1P	2	0.2
		E2USM	1	0.5
		E2USN	2	3.0
		E2USP	3	3.1
	Palustrine	PEM1Ah	1	32.3
		PEM1C	1	13.8
		PUSA	1	1.7
		PUSC	1	0.4
		PUSCh	1	1.6
		TOTALS	**18**	**175.7**
MI	Estuarine and Marine Deepwater and Wetland Habitats	E1UBL	1	9.7
		M1UBL	1	406.7
		M2USN	1	134.4
		M2USP	1	83.1
	Palustrine	PEM1A	3	0.3
		PEM1C	1	0.1
		TOTALS	**8**	**634.3**

Note: Uplands and NWI unmapped areas account for 104.7 acres of the HI-E PSA, for a total acreage of 269.4 acres, 82.0 acres of the SS2 PSA, for a total of 250.6 acres, 18.5 acres of the SS1 PSA, for a total of 589.9 acres, 118.4 acres of the PA4 PSA, for a total of 294.1 acres, and 351.7 acres of the MI PSA, for a total of 986.0 acres.

Estuarine wetlands are described as deepwater tidal habitats and adjacent tidal wetlands that are usually semi-enclosed by land but have open, partly obstructed, or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land. The salinity may be periodically increased above that of the open ocean by evaporation. Along some low-energy coastlines, there is appreciable dilution of sea water. Offshore areas with typical estuarine plants and animals, such as red mangroves (*Rhizophora mangle*) and eastern oysters (*Crassostrea virginica*), are also included in the Estuarine System. The following are descriptions of the Estuarine habitat classes that occur within the five BU PSAs:

- E1AB3L (Estuarine, subtidal, aquatic bed, rooted vascular, subtidal) - Estuarine wetlands and deepwater habitats dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Includes a large array of vascular species in the Marine and Estuarine systems. They are commonly referred to as grass flats. Some species are characterized by floating leaves. The substrate in these habitats is continuously covered with tidal water (i.e., located below extreme low water).
- E1UBL (Estuarine, subtidal, unconsolidated bottom, subtidal) – Estuarine deepwater habitats that are continuously covered with tidal water (i.e., located below extreme low water). Includes all wetlands and deepwater habitats with at least 25% cover of particles smaller than stones

(less than 6-7 cm), and a vegetative cover less than 30%. In this type of estuarine wetlands, tidal saltwater continuously covers the substrate.

- E1UBLx (Estuarine, subtidal, unconsolidated bottom, subtidal, excavated) - Estuarine deepwater habitats that are continuously covered with tidal water (i.e., located below extreme low water). Includes all wetlands and deepwater habitats with at least 25% cover of particles smaller than stones (less than 6-7 cm), and a vegetative cover less than 30%. In this type of estuarine wetlands, tidal saltwater continuously covers the substrate. This estuarine wetland is also a man-made excavated feature.
- E2EM1N (Estuarine, intertidal, emergent, persistent, regularly flooded) – Estuarine wetlands characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants. The substrate in these habitats is flooded and exposed by tides; includes the associated splash zone. Dominated by species that normally remain standing at least until the beginning of the next growing season. Tides alternately flood and expose the substrate at least once daily.
- E2EM1P (Estuarine intertidal persistent emergent wetland, irregularly flooded) – Estuarine wetlands characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants that normally remain standing at least until the beginning of the next growing season. This subclass is found only in the Estuarine and Palustrine systems. Tides flood the substrate less often than daily.
- E2SS3N (Estuarine, intertidal, Scrub-Shrub, Regularly Flooded) – Estuarine wetlands characterized by woody vegetation less than 6 m (20 feet) tall. The species include true shrubs, young trees (saplings), and trees or shrubs that are small or stunted because of environmental conditions. Includes woody angiosperms (trees or shrubs) with relatively wide, flat leaves that generally remain green and are usually persistent for a year or more; e.g. red mangrove (*Rhizophora mangle*). Tides alternately flood and expose the substrate at least once daily.
- E2USM (Estuarine, intertidal, unconsolidated shore, irregularly exposed) – Estuarine wetlands characterized by habitats that are flooded and exposed by tides; includes the associated splash zone. Includes all wetland habitats having two characteristics: (1) unconsolidated substrates with less than 75 percent areal cover of stones, boulders or bedrock and; (2) less than 30 percent aerial coverage of vegetation. Tides expose the substrate less often than daily.
- E2USN (Estuarine, intertidal, unconsolidated shore, regularly flooded) – Estuarine wetlands having two characteristics: (1) unconsolidated substrates with less than 75 percent areal cover of stones, boulders or bedrock and; (2) less than 30 percent areal cover of vegetation. The substrate in these habitats is flooded and exposed by tides; includes the associated splash zone. Landforms such as beaches, bars, and flats are included in the Unconsolidated Shore class. Tides alternately flood and expose the substrate at least once daily.
- E2USP (Estuarine intertidal unconsolidated shore, irregularly flooded) – Estuarine wetlands whose substrate is flooded and exposed by tides; includes the associated splash zone. Includes all wetland habitats having two characteristics: (1) unconsolidated substrates with less than 75 percent areal cover of stones, boulders or bedrock and; (2) less than 30 percent areal cover of vegetation. Landforms such as beaches, bars, and flats are included in the Unconsolidated Shore class. Tides flood the substrate less often than daily.

The Marine System consists of the open ocean overlying the continental shelf and its associated high-energy coastline. Marine habitats are exposed to the waves and currents of the open ocean,

and the Water Regimes are determined primarily by the ebb and flow of oceanic tides. Salinities exceed 30 parts per thousand (ppt), with little or no dilution except outside the mouths of estuaries. Shallow coastal indentations or bays without appreciable freshwater inflow, and coasts with exposed rocky islands that provide the mainland with little or no shelter from wind and waves, are also considered part of the Marine System because they generally support typical marine biota. The following are descriptions of the Marine habitat classes that occur within the six BU PSAs:

- M1UBL (Permanently flooded, open ocean deepwater habitat) - The substrate in these habitats is continuously covered with tidal water (i.e., located below extreme low water). Includes all wetlands and deepwater habitats with at least 25% cover of particles smaller than stones (less than 6-7 cm), and a vegetative cover less than 30%. Tidal salt water continuously covers the substrate.

- M2USN (Marine intertidal unconsolidated shore, regularly flooded) - The substrate in these habitats is flooded and exposed by tides; includes the associated splash zone. Includes all wetland habitats having two characteristics: (1) unconsolidated substrates with less than 75 percent areal cover of stones, boulders or bedrock and; (2) less than 30 percent areal cover of vegetation. Landforms such as beaches, bars, and flats are included in the Unconsolidated Shore class. Tides alternately flood and expose the substrate at least once daily.

- M2USP (Marine intertidal unconsolidated shore, irregularly flooded) - The substrate in these habitats is flooded and exposed by tides; includes the associated splash zone. Includes all wetland habitats having two characteristics: (1) unconsolidated substrates with less than 75 percent areal cover of stones, boulders or bedrock and; (2) less than 30 percent areal cover of vegetation. Landforms such as beaches, bars, and flats are included in the Unconsolidated Shore class. Tides flood the substrate less often than daily.

The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 ppt. It also includes wetlands lacking such vegetation, but with all of the following four characteristics: (1) area less than 8 ha (20 acres); (2) active wave-formed or bedrock shoreline features lacking; (3) water depth in the deepest part of basin less than 2.5 m (8.2 ft) at low water; and (4) salinity due to ocean-derived salts less than 0.5 ppt. The following are descriptions of the Palustrine habitat classes that occur within the six BU PSAs:

- PEM1A (Palustrine, emergent, persistent, temporarily flooded) - Characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants. Dominated by species that normally remain standing at least until the beginning of the next growing season. This subclass is found only in the Estuarine and Palustrine systems. Surface water is present for brief periods (from a few days to a few weeks) during the growing season, but the water table usually lies well below the ground surface for most of the season.

- PEM1Ah (Palustrine, emergent, persistent, temporarily flooded, diked/impounded) - Characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants. Dominated by species that normally remain standing at least until the beginning of the next growing season. This subclass is found only in the Estuarine and Palustrine systems. Surface water is present for brief periods (from a few days to a few weeks)

during the growing season, but the water table usually lies well below the ground surface for most of the season. These wetlands have been created or modified by a man-made barrier or dam that obstructs the inflow or outflow of water.

- PEM1C (Palustrine, emergent, persistent, seasonally flooded) - Characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants. Dominated by species that normally remain standing at least until the beginning of the next growing season. This subclass is found only in the Estuarine and Palustrine systems. Surface water is present for extended periods especially early in the growing season, but is absent by the end of the growing season in most years. The water table after flooding ceases is variable, extending from saturated to the surface to a water table well below the ground surface.

- PUSA (Palustrine, unconsolidated shore, temporarily flooded) - Includes all wetland habitats having two characteristics: (1) unconsolidated substrates with less than 75 percent areal cover of stones, boulders or bedrock and; (2) less than 30 percent areal cover of vegetation. Landforms such as beaches, bars, and flats are included in the Unconsolidated Shore class. Surface water is present for brief periods (from a few days to a few weeks) during the growing season, but the water table usually lies well below the ground surface for most of the season.

- PUSC (Palustrine, unconsolidated shore, seasonally flooded) - Includes all wetland habitats having two characteristics: (1) unconsolidated substrates with less than 75 percent areal cover of stones, boulders or bedrock and; (2) less than 30 percent areal cover of vegetation. Landforms such as beaches, bars, and flats are included in the Unconsolidated Shore class. Surface water is present for extended periods especially early in the growing season, but is absent by the end of the growing season in most years. The water table after flooding ceases is variable, extending from saturated to the surface to a water table well below the ground surface.

- PUSCh (Palustrine, unconsolidated shore, seasonally flooded, diked/impounded) - Includes all wetland habitats having two characteristics: (1) unconsolidated substrates with less than 75 percent areal cover of stones, boulders or bedrock and; (2) less than 30 percent areal cover of vegetation. Landforms such as beaches, bars, and flats are included in the Unconsolidated Shore class. Surface water is present for extended periods especially early in the growing season, but is absent by the end of the growing season in most years. The water table after flooding ceases is variable, extending from saturated to the surface to a water table well below the ground surface. These wetlands have been created or modified by a man-made barrier or dam that obstructs the inflow or outflow of water.

3.2.4 National Hydrography Dataset

The USGS NHD is developed to identify surface water systems throughout the United States primarily at the 7.5-minute topographic quadrangle scale (i.e., 1:24,000 scale). The NHD represents the drainage network with features such as rivers, streams, canals, lakes, ponds, coastline, dams and stream gages. The mapped drainage network is designed to be used for general reference, water resource naming, and in the flow analysis of surface water systems and watersheds. Table 3.2-4 summarizes the waterbodies mapped by the USGS NHD within the five PSAs. A map series showing the locations of NHD-mapped waterbodies within the PSAs is included as Figure 4 Map Series, Appendix A.

Table 3.2-4: USGS NHD Streams and Waterbodies within the Five Project Review Areas

Named Resource	Length (linear feet)
Aransas Channel	10,119
Lydia Ann Channel	617
Redfish Bay	1,290
Corpus Christi Ship Channel	31,714
Gulf of Mexico	27,889
TOTAL	**71,629**

3.2.5 FEMA Flood Hazard Data

The National Flood Hazard Layer (NFHL) is a geospatial database that contains current effective flood hazard data. FEMA provides the flood hazard data to support the National Flood Insurance Program (NFIP). Review of FEMA flood hazard mapping for Aransas and Nueces counties identifies that the five PSAs are located within three different flood zones, including Zone AE, Zone VE, and Zone X. Below is a description of each flood zone within the five PSAs:

- Zone AE – Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown on floodplain maps. Mandatory flood insurance purchase requirements and floodplain management standards apply.
- Zone VE – Coastal High Hazard Areas (CHHA) – High Risk. Zone VE is the flood insurance rate zone that corresponds to areas within the 1-percent-annual-chance coastal floodplain that have additional hazards associated with storm waves. Base Flood Elevations derived from the detailed hydraulic coastal analyses are shown at selected intervals within this zone. Mandatory flood insurance purchase requirements apply. Structures located within the CHHA have a 26-percent chance of flooding during the life of a standard 30-year mortgage.
- Zone X – Moderate and Minimal Risk Areas. Zone X is the flood insurance rate zone that corresponds to areas of minimal risk outside the 1-percent and 0.2-percent-annual-chance floodplains. No BFEs or base flood depths are shown within these zones. Buildings in these zones could be flooded by severe, concentrated rainfall coupled with inadequate local drainage systems. Flood insurance is available in participating communities but is not require by regulation in this zone.

Table 3.2-5 provides a summary of the FEMA flood hazard zone mapping within the five PSAs. A map showing the locations of FEMA flood hazard zones within the PSAs is included in Figure 5 Map Series, Appendix A.

Table 3.2-5: FEMA Flood Hazard Zones within the Five Project Review Areas

Flood Hazard Zone	Area (ac)
Zone 0.2 PCT ANNUAL CHANCE FLOOD HAZARD	67.90
Zone AE	483.62
Zone VE	1,516.96
Zone X	39.73
Open Water	281.79
TOTAL	**2,390**

Note: FEMA Floodplain maps of Nueces County are currently being studied and updated by FEMA. Mapping included within this report consists of existing FEMA floodplain mapping for Aransas and Nueces counties. Results of FEMA studies and updates for Nueces County are not expected to change the FEMA floodplain status for the five PSAs.

3.2.6 TPWD EMST Data

The EMST is an interactive GIS mapping tool which was developed and is maintained by TPWD. The EMST is utilized for identifying and categorizing various habitat types relating to soils, hydrology, ecoregion layers, and vegetative communities. The EMST data is separated into habitat types with correlating vegetation descriptions and ecological interpretations provided in the TPWD Texas Vegetation Classification Project: Interpretive Booklet for Phase 3 (TPWD, 2014). Table 3.2-6 summarizes different EMST habitat types and acreage amounts within the five PSAs. A map series showing the locations of EMST-mapped habitats within the PSAs is included in Figure 6 Map Series, Appendix A.

Dominant habitat types within the HI-E PSA include Coastal: Mangrove Shrubland (64.5 acres), Open Water (46.6 acres), Gulf Coast: Salty Prairie (37.7 acres), and Coastal: Salt and Brackish High Tidal Marsh (33.2 acres). Coastal: Mangrove Shrubland is described as shrublands dominated by black mangrove (*Avicennia germinans*). These tidal shrublands are often found as dominants in Redfish and Aransas bays. Open Water is described as an open body of water, with little or no emergent vegetation. Coastal: Salty Prairie is described as vegetation occupying saline soils, generally near-coast, on level topography of the Beaumont Formation. Sites may be nearly monotypic stands of Gulf cordgrass (*Spartina spartinae*), little bluestem (*Schizachyrium scoparium*), bushy bluestem (*Andropogon glomeratus*), switchgrass (*Panicum virgatum*), and marshhay cordgrass (*Spartina patens*). Coastal: Salt and Brackish High Tidal Marsh is described as irregularly flooded marsh dominated by graminoids such as marshhay cordgrass, saltgrass (*Distichlis spicata*), and bulrushes (*Schoenoplectus spp*.).

Dominant habitat types within the SS2 PSA include Coastal: Tidal Flat (89.2 acres), Coastal: Salt and Brackish High Tidal Marsh (74.6 acres), and Coastal: Salt and Brackish Low Tidal Marsh (21.8 acres). Coastal: Tidal Flat is described as unvegetated or sparsely vegetated flats affected by tidal fluctuations. Coastal: Salt and Brackish High Tidal Marsh habitat was previously described in association with the HI-E PSA. Coastal: Salt and Brackish Low Tidal Marsh is described as marshes frequently inundated by tides and dominated by smooth cordgrass (*Spartina alterniflora*).

Dominant habitat types within the SS1 PSA include Open Water (204.6 acres), Coastal: Tidal Flats (132.4 acres), and Coastal: Salt and Brackish Low Tidal Marsh. These habitat types were previously described in association with the HI-E and SS2 PSAs.

Dominant habitat types with the PA4 PSA include Coastal: Salt and Brackish High Tidal Marsh (149.2 acres), Open Water (44.6 acres), Coastal: Tidal Flats (33.0 acres), and Coastal: Salt and Brackish Low Tidal Marsh (8.99 acres). These habitat types were previously described in association with the HI-E, SS2 and SS1 PSAs.

Dominant habitat types within the MI PSA include Coastal and Lower Coastal: Beach (264.2 acres), Coastal and Sandsheet: Deep Sand Grassland (140.1 acres), and Non-native Invasive Common Reed (22.7 acres). Coastal and Lower Coastal: Beach is described as unvegetated to sparsely vegetated sandy shorelines adjacent to the Gulf of Mexico and bays interior to the barrier islands. Species such as goat-foot morning-glory (*Ipomoea pes-caprae*), beach morning-glory (*Ipomoea imperati*), and searockets (*Cakile spp.)* provide sparse vegetative cover. These areas generally lie near mean sea level and are often found between foredunes and tidal waters. Coastal and Sandsheet: Deep Sand Grassland is described as upland, grass-dominated vegetation on deep sands. Dunes are often dominated by sea oats (*Uniola paniculata*), with other species such as Gulf croton (*Croton punctatus*), bitter panicum (Panicum amarum), goat-foot morning glory, beach morning-glory, shoreline purslane (*Sesuvium portulacastrum*) also present. Upland grasslands are often dominated by seacoast bluestem (*Schizachyrium littorale*) and gulfdune paspalum (*Paspalum monostachyum*).

Table 3.2-6: EMST Habitat Types within the Five Project Review Areas

PSA	EMST Habitat Type	Area (ac)
HI-E	Coastal: Mangrove Shrubland	64.5
	Coastal: Salt and Brackish High Tidal Marsh	33.2
	Coastal: Sea Ox-eye Daisy Flats	18.4
	Gulf Coast: Salty Prairie	37.7
	Gulf Coast: Salty Prairie Shrubland	0.3
	Non-native Invasive-Salt Cedar Shrubland	5.3
	Open Water	46.6
	South Texas: Wind Tidal Flats	0.3
	Urban High Intensity	<0.1
	Open Water (unmapped)	63.2
	TOTAL	**269.4**
SS2	Coastal: Salt and Brackish High Tidal Marsh	74.6
	Coastal: Salt and Brackish Low Tidal Marsh	21.8
	Coastal: Sea Ox-eye Daisy Flats	2.9
	Coastal: Tidal Flat	89.2
	South Texas: Algal Flat	1.1
	Open Water	9.5
	Open Water (unmapped)	51.5
	TOTAL	**250.6**

PSA	EMST Habitat Type	Area (ac)
SS1	Coastal: Salt and Brackish High Tidal Marsh	9.6
	Coastal: Salt and Brackish Low Tidal Marsh	24.1
	Coastal: Tidal Flat	132.5
	South Texas: Algal Flat	2.9
	Open Water	204.6
	Open Water (unmapped)	216.2
	TOTAL	**589.9**
PA4	Coastal: Mangrove Shrubland	1.8
	Coastal: Salt and Brackish High Tidal Marsh	149.2
	Coastal: Salt and Brackish Low Tidal Marsh	9.0
	Coastal: Salt and Brackish High Tidal Shrub Wetland	1.4
	Coastal: Sea Ox-eye Daisy Flats	4.8
	Coastal: Tidal Flat	33.0
	Non-native Invasive Salt Cedar Shrubland	6.2
	Open Water	44.6
	Urban Low Intensity	1.2
	Open Water (unmapped)	42.9
	TOTAL	**294.1**
MI	Active Sand Dune	4.9
	Coastal: Sea Ox-eye Daisy Flats	5.1
	Coastal and Lower Coastal: Beach	264.2
	Coastal and Sandsheet: Deep Sand Grassland	140.1
	Coastal and Sandsheet: Deep Sand Shrubland	1.6
	Non-native Invasive: Common Reed	22.7
	Open Water	0.8
	Urban High Intensity	11.9
	Urban Low Intensity	14.9
	Open Water (unmapped)	519.8
	TOTAL	**986.0**

3.2.7 LiDAR Data

LiDAR is a remote sensing method that uses light in the form of a pulsed laser to measure ranges (variable distances) to the Earth's surface. These light pulses—combined with other data recorded by the airborne system— generate precise, three-dimensional information about the shape of the Earth and its surface characteristics. LiDAR data was obtained from the USGS National Map Download Client. LiDAR data for the five PSAs is included within the Figure 8 Map Series in Appendix A.

3.2.8 Antecedent Precipitation Tool (APT) Data

The Antecedent Precipitation Tool (APT) is an automation tool that USACE developed following implementation of the Navigable Water Protection Rule (NWPR) in 2020. The ATP is used to facilitate the comparison of antecedent or recent rainfall conditions for a given location to the range of normal rainfall conditions that occurred during the preceding 30 years. In addition to

providing a standardized methodology to evaluate normal precipitation conditions, the APT can also be used to assess the presence of drought conditions, as well as the approximate dates of the wet and dry seasons for a given location. The APT was used to evaluate rainfall conditions at each of the five PSAs during the wetland delineation survey time periods. APT rainfall results for each of the five PSAs are included within Appendix G.

3.3 Digital Mapping Methods and Process

The process of conducting a digital vegetation mapping inventory requires an ortho-rectified imagery base, ancillary data layers such as elevation, hydrography (i.e., streams and watersheds), field data (i.e., GPS location points, field notes, and site photographs) and the software to analyze and interpret those data layers. The mapping process utilizes the GPS data collected in the field to delineate wetland boundaries, SAV habitat boundaries, and other surface water features (i.e., lakes, ponds, streams, and ditches). Classification systems utilized in the field and entered into GPS point locations are utilized to identify mapped habitat types, characteristics, and other attributes such as dominant species, water regimes, and water depths. For the five BU PSAs, waters, wetlands, and SAV habitat mapping polygons were created using ESRI ArcGIS 10.7.1 software packages. The mapping process described herein includes information on vegetation interpretation techniques, application of the classification systems, and discusses quality assurance/quality control (QA/QC) measures.

3.3.1 Interpretation Techniques

The mapping process used for the five PSAs was a manual interpretation and delineation of the vegetation communities. Manual interpretation of the imagery provides for an accurate delineation of the major vegetation communities, provides statistics on their extent, and nature of their composition. The delineations are completed on-screen, within the GIS mapping environment. This delineation process is known as “heads-up digitizing.” There are no inaccuracies created through a transfer process or software image recognition process; the delineations are as accurate as the ortho-rectified imagery and GPS points allow. All waters, wetlands, and SAV boundaries within the five PSAs were recorded using sub-meter accuracy GPS units. The flagged waterbody, wetland and SAV boundaries were digitized in GIS using the GPS location information.

MHW and HTL elevations were recorded in the field using a sub-centimeter accuracy RTK unit at discreet plot locations along the shoreline of each PSA. Within the project GIS, these elevations points were digitized into line features indicating the MHW and HTL elevation contours between surveyed plot locations.

Wetland boundary flag locations were digitized in the project GIS into polygon features to identify the location and extent of the wetland habitats. No aerial imagery interpretation was performed for the delineation of the wetland boundaries. The wetland boundary locations are as accurate as the sub-meter GPS points allow. SAV habitat boundaries were recorded in the field and mapped using methods described in Triton’s Aquatic Resources Survey Workplan and Report included in Appendix E.

3.4 Quality Control Measures

Quality control measures are in place to check the field data collected and the field forms completed as well as to assure the integrity and accuracy of the digital mapping data. Digital mapping quality control measures include semi-automated GIS systems and senior scientist review. To ensure the integrity of the GIS digital line work, the files are validated through a semi-automated GIS model. This model evaluates the GIS mapping data and inspects for data gaps,

slivers, overlapping polygons, duplicate polygons, and multi-part polygons. All data errors are flagged and corrected as needed. This semi-automated quality control process provides for accurate summary statistics such as acreages reported.

The senior scientist review occurred collaboratively with the scientists who conducted the wetland, waterbody, and SAV field surveys. Additionally, field GPS data and field forms were collaboratively reviewed following completion of the field surveys. GIS mapping data was reviewed by senior scientists for consistency and to determine that resources were correctly identified according to the field data collected. The senior scientist review involves manually reviewing each mapped polygon individually across all coded attributes. Discrepancies between the field data collected and the delineated vegetation unit within the GIS are further inspected and rectified by the senior scientists.

After completion of the senior scientist review the mapping file is passed through the semi-automated GIS model once again to identify and rectify any physical discrepancies with the data. Upon a clean pass through the QA/QC model the data is considered final and made available for statistical analysis.

3.4.1 GPS Equipment Used and Quality Control

Field sample positional locations were collected using six Trimble GeoXH 6000 Series, sub-meter hand-held GPS units and a Trimble R8 RTK, sub-centimeter hand-held GPS unit with the capability of recording elevation data. The R8 RTK unit receives real-time sub-centimeter corrections from the VRS network. GPS units are equipped with Terrasync software used for data collection. Prior to mobilizing for field work, GPS units are setup with a Terrasync Data Dictionary to collect specific sample types and to record site characteristics using standard classification systems. Additionally, GPS units are setup with background files to delimit the five PSA boundaries and predetermined survey transects to assist field crews with navigation and data collection across the full extent of each PSA.

For quality control, post-processing differential correction of field collected GPS data was completed using Pathfinder Office software. Post-processing was completed individually for each day field surveys were conducted. The differential correction process used to complete the post-processing for this survey is as follows:

Pathfinder Office GPS Differential Correction

Process Used: Automatic Carrier and Code Processing

Single Base Station

GPS and GNSS Enabled (5 second rate)

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4 Waterbodies, Wetlands, SAV, and Oyster Delineation Results

4.1 Introduction

Waterbody, wetlands, and SAV delineations were conducted from April 27 through May 27, 2021 to identify potential WOUS as defined by the USACE (33 CFR 328.3(a)), wetlands (33 CFR 328.3(c)), SAV, and oyster habitat present within five separate PSAs located near the Corpus Christi Ship Channel in Aransas and Nueces counties, Texas. The locations and extent of these features are shown in the Figure 7, Figure 8, and Figure 9 Map Series within Appendix A. Results of the field delineation surveys document seven waterbody types (M1UBL, M2USN, E1UBL, E1ABL, E1RF2L, E2USN, and PUBH), six types of estuarine wetland habitats (E2ABM, E2ABN, E2EM1N, E2EM1N1, E2EM1P, and E2SS3N), four types of palustrine wetland habitats (PEM1C, PEM1C1, PSS1C, and PSS3C), five species of SAV (shoalweed (*Halodule wrightii*), turtle grass (*Thalassia testudinum*), star grass (*Halophila engelmannii*), widgeon grass (*Ruppia maritima*), and manatee grass (*Syringodium filiforme*)), and one species of oyster (eastern oyster (*Crassostrea virginica*), live oyster beds mapped as E1RF2L, were identified within the five PSAs. Locations and acreage amounts of identified waters and wetlands by site are included in Tables 4.5-1 through 4.5-5 (waters) and Tables 4.6-1 through 4.6-5 (wetlands) within Section 4 “Waterbodies, Wetlands, SAV, and Oyster Delineation Results. Table 5.1-1 provides a summary of waters and wetlands delineated within the five PSA’s combined.

4.2 General Waterbody Description

Within the five PSAs, the Project identified seven waterbody types comprised of marine open water-subtidal (M1UBL), marine unconsolidated shore-intertidal (M2USN), estuarine open water-subtidal (E1UBL), estuarine aquatic bed-subtidal (E1ABL), estuarine reef mollusk-subtidal (E1RF2L), estuarine unconsolidated shore-intertidal (E2USN), and palustrine open water (PUBH). A description of each waterbody type identified during the surveys, as well as locations of these waterbodies within the five PSAs is included in section 4.2.1 through 4.2.3 below.

Tables 4.5-1 through 4.5-5 list waterbodies identified at each of the five PSAs and include an acreage summary for each waterbody type. For reference, GPS attribute tables for the MHW, HTL, and OHWM boundary points collected in the field are provided in Appendix F.

4.2.1 Marine Waterbodies

The Marine System consists of the open ocean overlying the continental shelf and its associated high-energy coastline. Marine habitats are exposed to the waves and currents of the open ocean, and the Water Regimes are determined primarily by the ebb and flow of oceanic tides. Salinities exceed 30 parts per thousand (ppt), with little or no dilution except outside the mouths of estuaries. Shallow coastal indentations or bays without appreciable freshwater inflow, and coasts with exposed rocky islands that provide the mainland with little or no shelter from wind and waves, are also considered part of the Marine System because they generally support typical marine biota.

4.2.1.1 Marine Open Water – Subtidal

The two marine open water- subtidal waterbodies identified in the field included the Gulf of Mexico (M1UBL) and the portion of the CCSC that extends into the Gulf of Mexico (M1UBL). Both waterbodies were identified within the MI PSA. According to the *Classification of Wetlands and*

Deepwater Habitats of the United States (Cowardin et al., 1979), M1UBL is described as Marine, Subtidal, Unconsolidated Bottom, Subtidal. Marine open water bodies were associated with deep water bays, channels, and ocean located along the shoreline of the MI PSA. Marine open waterbodies are classified by the TPWD EMST Interpretive Booklet for Phase 3 (TPWD, 2014) as Open Water, which includes lakes, rivers, marine water, and ephemeral ponds.

Regulatory limits of the two marine waterbodies are shown within the Figure 7, Figure 8, and Figure 9 Map Series within Appendix A. Under Section 10 of the RHA, the USACE regulates excavation, installation of structures, and the discharge of dredged material below the MHW elevation of tidal waterbodies, determined to be +1.01 feet NAVD88. Under Section 404 of the CWA, USACE regulates the discharge of dredged or fill material within a WOUS up to the landward limit of jurisdiction for a tidal water as defined by the HTL elevation, determined to be +2.7 feet NAVD88.

4.2.1.2 Marine Unconsolidated Shore - Intertidal

The one marine unconsolidated shore-intertidal water (M2USN) identified in the field included the Gulf of Mexico shoreline/beach. This water was identified within the MI PSA. According to the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979), M2USN is described as Marine, Intertidal, Unconsolidated Shore, Regularly Flooded. Marine unconsolidated shore-intertidal mapped within the MI PSA is classified by the TPWD EMST (TPWD, 2014) as Texas Coastal Beach-Gulf and is described as unvegetated to sparsely vegetated shorelines adjacent to the Gulf of Mexico and bays interior to the barrier islands.

Regulatory limits of the marine unconsolidated shoreline-intertidal is shown on the Figure 7, Figure 8, and Figure 9 Map Series within Appendix A. Under Section 10 of the RHA, the USACE regulates excavation, installation of structures, and the discharge of dredged material below the MHW elevation of tidal waterbodies, determined to be +1.01 feet NAVD88. Under Section 404 of the CWA, USACE regulates the discharge of dredged or fill material within a WOUS up to the landward limit of jurisdiction for a tidal water as defined by the HTL elevation, determined to be +2.7 feet NAVD88.

4.2.2 Estuarine Waterbodies

The Estuarine System consists of deepwater tidal habitats and adjacent tidal wetlands that are usually semi-enclosed by land but have open, partly obstructed, or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land. The salinity may be periodically increased above that of the open ocean by evaporation. Along some low-energy coastlines, there is appreciable dilution of sea water. Offshore areas with typical estuarine plants and animals, such as red mangroves (*Rhizophora mangle*) and eastern oysters (*Crassostrea virginica*), are also included in the Estuarine System.

4.2.2.1 Estuarine Open Water – Subtidal

Estuarine open water – subtidal waterbodies (E1UBL) were delineated within the HI-E, SS2, SS1, and PA4 PSAs and the Aransas Channel (HI-E), Lydia Ann Channel (HI-E), Redfish Bay (SS1, PA4), CCSC (SS2, SS1, PA4), open water tidal ponds (E1UBL) that extend inland within the PSA but occur at elevations below the MHW were observed within the SS1 and HI-E PSA. According to the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979), E1UBL is described as Estuarine, Subtidal, Unconsolidated Bottom, Subtidal. Estuarine open water bodies mapped within the PSAs are classified by the TPWD EMST (TPWD, 2014) as Open Water, which includes lakes, rivers, marine water, and ephemeral ponds. Water depths for

identified estuarine ponds ranged from approximately 1-4 feet in depth at the HI-E and SS1 PSAs and approximately 1-8 feet in depth at the SS2 PSA.

Regulatory limits of the estuarine open water-subtidal waterbodies are shown on the Figure 7, Figure 8, and Figure 9 Map Series within Appendix A. Under Section 10 of the RHA, the USACE regulates excavation, installation of structures, and the discharge of dredged material below the MHW elevation of tidal waterbodies, determined to be +1.01 feet NAVD88. Under Section 404 of the CWA, USACE regulates the discharge of dredged or fill material within a WOUS up to the landward limit of jurisdiction for a tidal water as defined by the HTL elevation, determined to be +2.7 feet NAVD88.

4.2.2.2 Estuarine Aquatic Bed – Subtidal (Rooted Vascular (SAV))

Estuarine aquatic bed-subtidal waterbodies (E1ABL), which include SAV, were delineated at the HI-E, SS1, and PA4 PSAs. According to the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979), E1ABL waters are classified as Estuarine, Subtidal, Aquatic Bed, Subtidal (Cowardin et al., 1979). No SAV was present at the SS2 or MI PAs. Four species of SAV, including shoalweed (*Halodule wrightii*), turtle grass (*Thalassia testudinum)*, star grass (*Halophila engelmanni*), and widgeon grass (*Ruppia maritima*) were found at the HI-E, SS1, and PA4 PAs growing along the bayward shorelines. A fifth species of SAV, manatee grass (*Syringodium filiforme*), was only found at the SS1 PSA. More detailed results of the SAV surveys are included in Triton's Aquatic Resources Report included in Appendix E.

Regulatory limits of the three identified seagrass beds are shown on the Figure 7, Figure 8 Map, and Figure 9 Map Series within Appendix A.

4.2.2.3 Estuarine Reef – Subtidal

Estuarine reef-subtidal waterbodies (E1RF2L), which include one species of oyster, the eastern oyster (*Crassostrea virginica*), were identified at the HI-E, SS1, and PA4 PAs. No oyster beds were identified at SS2 or MI PAs. According to the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979), E1RF2L is described as Estuarine, Subtidal, Reef, Mollusk, Subtidal. Reefs are characterized as ridge-like or mound-like structures formed by the colonization and growth of sedentary invertebrates. More detailed results of the oyster surveys are included in Triton's Aquatic Resources Report included in Appendix E.

Regulatory limits of the oyster beds are shown on the Figure 7, Figure 8, and Figure 9 Map Series within Appendix A.

4.2.2.4 Estuarine Unconsolidated Shore – Intertidal

Estuarine unconsolidated shore-intertidal waterbodies (E2USN) were delineated within four of the five PSAs, including HI-E, SS2, SS1, and PA4. According to the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979), E2USN is described as Estuarine, Intertidal, Unconsolidated Shore, Regularly Flooded and includes all sand areas located between the MHW and HTL elevation contours. Unconsolidated shore-intertidal areas at the HI-E, SS2, SS1 and PA4 PSAs included estuarine shoreline areas and sand/tidal flats at the SS1 PSA only.

Estuarine unconsolidated shore-intertidal areas mapped within the HI-E, SS2, SS1, and PA4 PSAs were observed to include two distinct habitat types identified by the TPWD EMST (TPWD, 2014). These habitat types include Texas Coastal Beach-Bay and Coastal: Tidal Flats. Texas Coastal Beach-Bay is described as unvegetated to sparsely vegetated shorelines adjacent to the Gulf of Mexico and bays interior to the barrier islands. Coastal: Tidal Flats is described as a

system that occurs on flats influenced by tidal inundation, primarily driven by winds rather than by diurnal or semidiurnal tidal fluctuations.

Regulatory limits of the estuarine unconsolidated shore-intertidal waterbodies are shown on the Figure 7, Figure 8, and Figure 9 Map Series within Appendix A. Under Section 10 of the RHA, the USACE regulates excavation, installation of structures, and the discharge of dredged material below the MHW elevation of tidal waterbodies, determined to be +1.01 feet NAVD88. Under Section 404 of the CWA, USACE regulates the discharge of dredged or fill material within a WOUS up to the landward limit of jurisdiction for a tidal water as defined by the HTL elevation, determined to be +2.7 feet NAVD88.

4.2.3 Palustrine Waterbodies

The Palustrine System includes all non-tidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 ppt. It also includes wetlands lacking such vegetation, but with all of the following four characteristics: (1) area less than 8 ha (20 acres); (2) active wave-formed or bedrock shoreline features lacking; (3) water depth in the deepest part of basin less than 2.5 m (8.2 ft) at low water; and (4) salinity due to ocean-derived salts less than 0.5 ppt.

4.2.3.1 Palustrine Open Water

Three palustrine open waterbody ponds (PUBH) were identified in the field and are located within the PA4 PSA. According to the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979), PUBH is described as Palustrine, Unconsolidated Bottom, Permanently Flooded. Palustrine open waterbodies mapped within the PA4 PSA are classified by the TPWD EMST (TPWD, 2014) as Open Water, which includes lakes, rivers, marine water, and ephemeral ponds.

Regulatory limits of the palustrine open waterbodies were identified in the field and shown on the Figure 7, Figure 8, and Figure 9 Map Series within Appendix A. Under Section 404 of the CWA, USACE regulates the discharge of fill material non-tidal waterbodies below the OHWM. The OHWM boundary for the three palustrine waterbodies was visually identified along the ponds' shoreline using physical characteristics such a natural impressed bank and shelving, without utilizing a specific elevation.

4.3 General Wetland Descriptions

Delineated wetlands within the five PSAs consisted of estuarine and palustrine wetlands. Estuarine wetlands are described by the USFWS NWI as consisting of deepwater tidal habitats and adjacent tidal wetlands that are usually semi-enclosed by land, but have open, partly obstructed, or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land. The salinity may be periodically increased above that of the open ocean by evaporation. Along some low-energy coastlines, there is appreciable dilution of sea water. Offshore areas with typical estuarine plants and animals, such as red mangroves (*Rhizophora mangle*) and eastern oysters (*Crassostrea virginica*), are also included in the Estuarine System (Cowardin et al., 1979). This survey used the HTL elevation contour as the break between estuarine tidal wetlands and palustrine non-tidal wetlands.

Palustrine wetlands are described by the USFWS NWI as including all non-tidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 ppt. It also includes wetlands lacking such vegetation, but with all of the following four characteristics:

(1) area less than 8 ha (20 acres); (2) active wave-formed or bedrock shoreline features lacking; (3) water depth in the deepest part of basin less than 2.5 m (8.2 ft) at low water; and (4) salinity due to ocean-derived salts less than 0.5 ppt (Cowardin et al., 1979).

Locations and extents of delineated wetlands for the five PSAs are shown in the Figure 7, Figure 8, and Figure 9 Map Series within Appendix A. Tables 4.6-1 through 4.6-5 list wetlands identified at each of the five PSAs.

The USACE Wetland Determination Data Forms completed at WD and UD plot locations are provided in Appendix C. Site photos taken at WD and UD plot locations are included in this report as Appendix D. For reference, the attribute tables for the WD, UD and WF GPS points collected in the field are provided in Appendix F.

Wetlands identified during field surveys are described below and grouped according to NWI Cowardin classifications:

4.3.1 Estuarine Emergent Wetlands

4.3.1.1 Estuarine Low Marsh

Estuarine low marsh wetlands were delineated within four of the five PSAs, including HI-E, SS2, SS1, and PA4 and are classified as Estuarine, Intertidal, Emergent Persistent, Regularly Flooded (E2EM1N) and Estuarine, Intertidal, Emergent Persistent, Regularly Flooded, Hyperhaline (E2EM1N1) according to the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979). Low marsh wetlands occurred intermittently along shorelines and within low-lying interior portions of the PSAs below HTL elevations and were closely associated to the MHW elevation.

Low marsh wetlands classified as E2EM1N were dominated by smooth cordgrass (*Spartina alterniflora*). Low marsh wetlands were typically bounded by black mangrove or unvegetated shoreline on their landward boundary and open water on the seaward boundary. Low marsh wetlands classified as E2EM1N1 were dominated by dwarf glasswort (*Salicornia bigelovii*), pickleweed (*Sarcocornia ambigua*), and Virginia glasswort (*Salicornia depressa*), with occasional pioneering black mangrove (*Avicennia germinans*). Low marsh wetlands located within interior portions of the PSAs were typically found as monocultures of dwarf glasswort or pickleweed and sometimes included small stands of black mangrove interspersed with these species. Typical hydric soil indicators found during delineations within low marsh wetlands included sandy redox and sandy gleyed matrix. Typical hydrological indicators found during delineations within low marsh areas included inundation, saturation, geomorphic position, high water table, and drift deposits.

Estuarine low marsh wetlands mapped throughout the HI-E, SS2, SS1, and PA4 PSA were observed to include three distinct habitat types identified by the TPWD EMST (TPWD, 2014). These habitat types include Coastal: Salt and Brackish Low Tidal Marsh, South Texas Salt and Brackish Tidal Flats, and Coastal: Mangrove Shrubland. Coastal: Salt and Brackish Low Tidal Marsh is described by the TPWD EMST as marshes frequently inundated by tides and dominated by smooth cordgrass (*Spartina alterniflora*).

South Texas Salt and Brackish Tidal Flats are described by the TPWD EMST as a system that occurs on flats induced by tidal fluctuations in water level, primarily driven by winds rather than diurnal or semidiurnal tidal fluctuations. Due to the nearly level conditions of these flats, small fluctuations in tidal level may result in extensive changes in inundation patterns. Some sites may have sparse vegetation consisting of dwarf glasswort (*Salicornia bigelovii*), Virginia glasswort (*Salicornia depressa*), saltwort (*Batis maritima*), annual seepweed (*Suaeda linearis*) shoreline

seapurslane (*Sesuvium portulacastrum*), shoregrass (*Distichlis littoralis), and/or* saltgrass*, (Distichlis spicata)*, but are typically unvegetated or covered by a layer of blue green algae (*Lyngbya spp).*

Coastal: Mangrove Shrubland is described by the TPWD EMST as shrublands dominated by black mangrove (*Avicennia germinans*). These shrublands become increasingly well-developed towards the south. Fairly well-developed mangrove shrublands can be found in Redfish Bay near Aransas Pass, Texas.

4.3.1.2 Estuarine High Marsh

Estuarine high marsh wetlands were delineated within four of the five PSAs. No estuarine high marsh wetlands were observed within the MI PSA. These wetlands are classified as Estuarine, Intertidal, Emergent Persistent, Irregularly Flooded (E2EM1P) according to the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979). Estuarine high marsh wetlands occurred along shorelines and within interiors of the four PSAs, typically just landward of estuarine low marsh wetlands, and extending inland to the HTL elevation. High marsh wetlands were dominated by saltwort (*Batis maritima),* saltgrass (*Distichlis spicata*), and shoregrass (*Distichlis littoralis*) and occasional sea ox-eye daisy (*Borrichia frutescens*) that was present below the HTL. High marsh wetlands were typically bounded by estuarine low marsh wetlands on their seaward boundary and Palustrine Emergent wetlands or uplands on their landward boundary. Typical hydric soil indicators observed during delineations included only sandy redox. Typical hydrological indicators found during delineations included geomorphic position, FAC-neutral test, oxidized rhizospheres along living roots, drift deposits, and saturation.

Estuarine high marsh wetlands were observed to include one distinct habitat type identified by the TPWD EMST (TPWD, 2014). This habitat type is titled Coastal: Salt and Brackish High Tidal Marsh and is described by the TPWD EMST as irregularly flooded marsh dominated by graminoids such as marshhay cordgrass, saltgrass, bulrushes (*Schoenoplectus spp*.), seashore dropseed (*Sporobolus virginicus)*, and Gulf cordgrass (*Spartina spartinae*).

4.3.2 Estuarine Scrub Shrub Wetlands

4.3.2.1 Black Mangrove Wetlands

Estuarine black mangrove wetlands were delineated within four of the five PSAs, including HI-E, SS2, SS1, and PA4 PSAs and are classified as Estuarine, Intertidal, Scrub-shrub Broadleaf Evergreen, Regularly Flooded (E2SS3N) according to the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979). Black mangrove wetlands occurred intermittently along tidally influenced shorelines, within low-lying interiors of the PSAs, and along the fringes of excavated ponds. Black mangrove stands were found growing below HTL and within interior, regularly flooded portions, of the HI-E, SS2, SS1, and PA4 PSAs. Black mangrove wetlands were primarily a monoculture of black mangrove shrubs (*Avicennia germinans*) with occasional intermixed patches of smooth cordgrass (*Spartina alterniflora*) along the seaward boundary and compositions of estuarine low marsh species including dwarf glasswort (*Salicornia bigelovii*), pickleweed (*Sarcocornia ambigua*), and Virginia glasswort (*Salicornia depressa*) along the landward boundary of the mangrove wetland. Black mangrove wetlands were typically bounded by low marsh or open water on their seaward boundary and high marsh, unvegetated shoreline, or palustrine wetlands on their landward boundary. Black mangroves growing within interiors of the PSAs were typically surrounded by a mixture of pickleweed species. Hydric soil indicators observed during delineations included only sandy gleyed matrix. Typical hydrological indicators observed during delineations included inundation, saturation, and high water table.

Black mangrove wetlands are classified by the TPWD EMST (TPWD, 2014) as Coastal: Mangrove Shrubland. As previously defined within this report, Coastal: Mangrove Shrubland is defined by the TPWD EMST as shrublands dominated by black mangrove (*Avicennia germinans*). These shrublands become increasingly well-developed towards the south. Fairly well-developed mangrove shrublands can be found in Redfish Bay near Aransas Pass, Texas.

4.3.3 Estuarine Aquatic Bed

4.3.3.1 Algal Flats

Algal Flats were delineated within four of the five PSAs including HI-E, SS2, SS1, and PA4 and are classified as Estuarine, Intertidal, Aquatic Bed, Regularly Flooded (E2ABN) and Estuarine, Intertidal, Aquatic Bed, Irregularly Exposed (E2ABM) according to the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979). Algal flats were located within interior portions of the PSAs and fringed by low and high marsh estuarine wetlands. Portions of algal flat habitats were submerged with approximately 0.5-1 foot of standing water while other portions showed recent signs of inundation. Algal flats were located below the HTL elevation and transitioned into sand flats as they moved further inland towards high marsh estuarine wetland boundaries and sand flat uplands that extend above the HTL elevation. Inland open-water depressions that occurred above the MHW elevation were classified as E2ABM as they typically develop algal beds during the summer and fall months. Less than 5% vegetative coverage was present within algal flat areas. Hydric soil indicators observed during delineations included only sandy gleyed matrix. Typical hydrological indicators found during delineations included inundation, saturation, high water table, algal mat, surface soil cracks, and hydrogen sulfide odor.

Estuarine algal flats are classified by the TPWD EMST (TPWD, 2014) as South Texas: Algal Flats. These areas are described as flats dominated by blue-green algae (*Lyngbya spp.).* Algal flats cover the surface of vast areas and greatly enhances the productivity of these tidal flats.

4.3.4 Palustrine Emergent Wetlands

4.3.4.1 Coastal Wet Prairie and Sea Ox-eye Daisy Flat Wetlands

Coastal wet prairie and sea ox-eye daisy flat wetlands were delineated within all five of the PSAs and are classified as Palustrine, Emergent Persistent, Seasonally Flooded (PEM1C) and Palustrine, Emergent Persistent, Seasonally Flooded, Hyperhaline (PEM1C1) according to the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979). Palustrine emergent wetlands were located above the HTL elevation and are not tidally influenced.

Coastal prairie wetlands were typically associated with the estuarine high marsh boundary and extended inland to the upland boundary. In addition, they occurred on PA4 as large monotypic stands of sea ox-eye daisy flats and on SS1 as sea ox-eye daisy mounds with slightly higher elevations than the surrounding landscape. Coastal prairie wetlands were also present on the MI PSA as interdunal swale wetlands located behind the primary dune ridge. Palustrine emergent wetlands classified as PEM1C1 were pickleweed dominated flats that occur above the HTL elevation. Coastal prairie wetlands were dominated by salt meadow cordgrass (*Spartina patens*), sea ox-eye daisy (*Borrichia frutescens*), Gulf cordgrass, (*Spartina spartinae*), and gulf dune paspalum (*Paspalum monostachyum*). Hydric soil indicators observed during delineations included only sandy redox. Typical hydrological indicators observed during delineations included geomorphic position, FAC-neutral test, inundation, saturation, and algal mat or crust.

Palustrine emergent coastal prairie wetlands were observed to include four distinct habitat types identified by the TPWD EMST (TPWD, 2014) as Texas Saline Coastal Prairie, Sea Ox-eye Daisy Flats, Southeastern Coastal Plain Interdunal Wetlands, and Texas Salty Prairie (*Salicornia* flats above HTL). Texas Saline Coastal Prairie is described as a system that occupies saline soils, generally near-coast, on level topography of the Beaumont Formation. Sites may be monotypic stands of Gulf cordgrass (*Spartina spartinae*). Other graminoids that may be present to abundant include little bluestem, bushy bluestem, switchgrass (*Panicum virginicum*), and rat-tail smutgrass (*Sporoblus indicus*). Marshhay cordgrass, seashore dropseed (*Sporobolus virginicus*), and seashore paspalum (*Paspalum vaginatum*) may be common, particularly on wetter sites.

Sea ox-eye daisy flats are described by the TPWD EMST as irregularly flooded flats dominated by sea-ox eye daisy. These flats become very extensive from Corpus Christi Bay southward.

Southeastern Coastal Plain Interdunal Wetlands are described by the TPWD EMST as wetlands that occur on topographic lows in nearly level to steeply rolling landscapes on sands and deep sands along the coast and inland on the South Texas Sand Sheet. They are alternatively wet and dry (due to seasonal rainfall events) and typically lack tidal influence but may contain halophytic species due to the influence of salt spray and repeated inundation and evaporation.

Texas Salty Prairie is described as a typically herbaceous system that occupies soils of relatively high salinity. Soil salinity of sites occupied by this system result from the deposition of salts from the surrounding landscapes into alluvial sites where repeated flooding and evaporation bring salts to the surface.

4.3.5 Palustrine Scrub Shrub Wetlands

4.3.5.1 Non-Native Invasive Brazilian Peppertree Wetlands

Wetlands dominated by non-native invasive Brazilian peppertree (*Schinus terebinthifolia*) were delineated within the PA4 PSA and classified as Palustrine, Scrub Shrub Broad-Leaved Deciduous, Seasonally Flooded (PSS1C) according to the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979). Brazilian pepper trees were found growing in monotypic stands within both wetland and upland habitats at PA4 and observed within only upland habitats on SS2, HI-E, and MI PSAs. Non-Native Invasive Brazilian peppertrees were located above the HTL and are not tidally influenced. They were typically found growing along the edges of coastal prairie wetlands described under Section 4.3.5.1 above and also along the edges of open water palustrine ponds described under Section 4.2.3 above. Within wetlands dominated by Brazilian peppertree, hydric soil indicators observed during delineations included only sandy redox. Typical hydrological indicators observed during delineations included inundation, saturation, geomorphic position, FAC-neutral test, and oxidized rhizospheres.

Wetland and upland shrublands dominated by non-native invasive Brazilian peppertree are classified by the TPWD EMST (TWPD, 2014) as Non-native Invasive: Brazilian Pepper Tree Shrubland. This habitat classification is described as invasive shrublands dominated by Brazilian pepper tree. Species such as shrubby sumpweed (*Iva frutescens*), baccharis (*Baccharis sp.),* honey mesquite (*Prosopsis glandulosa*), and sea-ox eye daisy may also be present.

4.3.5.2 Non-Tidal Black Mangrove Wetlands

Black mangrove wetlands that extended above the HTL elevation contour, and therefore considered non-tidal, palustrine wetlands, were delineated within four of the five PSAs, including HI-E, SS2, SS1, and PA4 PSAs and are classified as Palustrine, Scrub-shrub Broadleaf Evergreen, Seasonally Flooded (PSS3C) according to the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979). Black mangrove wetlands

occurred intermittently along tidally influenced shorelines, within low-lying interiors of the PSAs, and along the fringes of excavated ponds. Black mangrove non-tidal wetlands were primarily a monoculture of black mangrove shrubs (*Avicennia germinans*) typically surrounded by a mixture of pickleweed species. Hydric soil indicators observed during delineations included only sandy gleyed matrix. Typical hydrological indicators observed during delineations included inundation, saturation, and high water table.

Black mangrove wetlands are classified by the TPWD EMST (TPWD, 2014) as Coastal: Mangrove Shrubland. As previously defined within this report, Coastal: Mangrove Shrubland is defined by the TPWD EMST as shrublands dominated by black mangrove (*Avicennia germinans*). These shrublands become increasingly well-developed towards the south. Fairly well-developed mangrove shrublands can be found in Redfish Bay near Aransas Pass, Texas.

4.4 General Upland Descriptions

4.4.1 Coastal Prairie Uplands

Coastal prairie uplands were present on three of the five PSAs, including HI-E, SS2, and PA4. Coastal prairie uplands were typically located landward of the high marsh boundary and were dominated by little bluestem *(Schizachyrium scoparium),* prickly pear cactus (*Opuntia stricta*), Kleberg bluestem (*Dichanthium annulatum),* white sweetclover *(Melilotus alba),* silverleaf sunflower *(Helianthus argophyllus),* and honey mesquite *(Prosopis glandulosa).* Large expanses of coastal prairie uplands were found at HI-E, SS2, and PA4 and were mostly associated with higher elevations resulting from the historic placement of dredged material.

Coastal Prairie uplands are classified by the TPWD EMST (TWPD, 2014) as Texas-Louisiana Coastal Prairie. This habitat is described as mid- to tall grass prairie that occupies Pleistocene surfaces of the Texas and Louisiana coast, on non-saline soils of level to gently rolling topography. It is dominated by graminoid species such as little bluestem, Indiangrass (*Sorghastrum nutans*), brownseed paspalum (*Paspalum plicatulum*), switchgrass (*Panicum virgatum*), and tall dropseed (*Sporobolus compositus*). Honey mesquite and huisache (*Acacia farnesiana*), amongst other woody species, may also be present.

4.4.2 Coastal Dune Uplands and Grasslands

Coastal dune uplands and grasslands were present within the MI PSA only. Coastal dune uplands and grasslands were located on the higher elevations of active primary and secondary sand dunes, beginning on the Gulf beach side and traversing over the dunes to the backdune landscape. Coastal grasslands were observed interspersed with interdunal swale wetlands described as PEM1C under Section 4.3.6 above. Dominant vegetation present within coastal dune uplands and grasslands include silver leaf sunflower (*Helianthus argophyllus),* bitter panicum (*Panicum amarum*), coastal groundcherry (*Physalis angustifolia*), Gulf croton (*Croton punctatus*), shoreline sea purslane (*Sesuvium portulacastrum*), and beach morning glory (*Ipomea imperati*).

Coastal dune uplands and grasslands are classified by the TPWD EMST (TWPD, 2014) as Texas Coast Dune and Coastal Grassland. This habitat system includes upland, grass dominated vegetation on deep sands. Dunes are often dominated by sea oats (*Uniola paniculata*), with other species such as Gulf croton, bitter panicum, beach morning glory, shoreline sea purslane and searocket (*Cakile spp*). Coastal dune uplands and grasslands occur within the primary and secondary dunes, as well as relatively level areas, where deep sands are deposited. Significant local topography, in the form of swales and pothole wetlands, may be present but are excluded from this system.

4.4.3 Other Types of Upland Habitats

Other typical upland habitats observed include upland sand flats, upland Brazilian peppertree, and upland beach. Upland sand flat areas were present on the HI-E, SS2, SS1, PA4, and MI PSAs and included sandy unvegetated areas (less that 5% vegetative cover) located above the HTL. Upland Brazilian peppertree habitats were present on the HI-E, SS2, and PA4 PSAs, typically as large stands along the fringes of palustrine emergent wetlands. Upland beach habitat was present at the MI PSA and included sandy unvegetated areas (less than 5% vegetative cover) along the Gulf beach.

4.5 Summary Tables of Waters Delineated Within the Five PSAs

The following tables list marine, estuarine, and palustrine waterbodies identified at each of the five PSAs.

Table 4.5-1: Waters Delineated Within the HI-E PSA

Count	Wetland Name	Cowardin	Acres[1] within PSA	No. of Wetland Polygons	TPWD EMST Classification	Date Surveyed	Latitude[2] (DD)	Longitude[2] (DD)
Section 10/404 Tidal Waters								
1	WAT01	E1UBL	86.549	13	Estuarine Open Water - Aransas Channel; Lydia Ann Channel	5/18/2021; 5/20/2021	27.85316	-97.064098
2	WAT02	E1ABL	18.368	4	Estuarine Open Water-Seagrass Bed	5/18/2021; 5/20/2021	27.854549	-97.067203
3	WAT02A	E1RF2L	0.958	40	Estuarine Open Water-Oysters	5/18/2021; 5/20/2021	27.854590	-97.067203
4	WAT04	E1UBL	0.758	1	Estuarine Open Water-Pond	5/18/2021	27.858012	-97.069341
5	WAT05	E1UBL	0.839	1	Estuarine Open Water-Pond	5/18/2021	27.857303	-97.069284
6	WAT06	E1UBL	0.627	1	Estuarine Open Water-Pond	5/18/2021	27.858822	-97.06680
7	WAT07	E1UBL	0.246	1	Estuarine Open Water-Pond	5/18/2021	27.857668	-97.064885
8	WAT08	E1UBL	0.460	2	Estuarine Open Water-Pond	5/18/2021	27.857814	-97.059989
Section 10/404 Subtotal			**108.805**	**63**				
Section 404 Tidal Waters								
9	WAT03	E2USN	2.427	39	Texas Coastal Beach-Estuarine	5/18/2021; 5/20/2021	27.856528	-97.059997
TOTALS			**111.232**	**102**				

Notes: [1] *Acreage amounts for E1ABL (seagrass beds) were provided from survey data collected by Triton. Any minor discrepancy between seagrass acreages provided within the Triton Aquatic Resources Survey Report and the Mott MacDonald Waters and Wetlands Delineation Report can be attributed to wetland delineation data clipping out small acreages of seagrass data where these two habitat types overlap.*

[2] *Latitude/longitude recorded for the polygon centroid of the delineated water.*

Below is a summary of waters delineated within the HI-E PSA:

- A total of 108.805 acres of waterbodies are located below the MHW elevation and are therefore subject to both Section 10 and Section 404 regulations. These include a total of 89.479 acres of estuarine subtidal waterbodies (E1UBL), 18.368 acres of estuarine subtidal aquatic beds (E1ABL), and 0.958 acres of oyster beds (E1RF2L).

- Waters that occur between the MHW and HTL elevation contours, and are therefore subject to Section 404 regulation, include 2.427 acres of estuarine intertidal unconsolidated shores (E2USN).

Table 4.5-2: Waters Delineated Within the SS2 PSA

Count	Wetland Name	Cowardin	Acres within PSA	No. of Wetland Polygons	TPWD EMST Classification	Date Surveyed	Latitude[1] (DD)	Longitude[1] (DD)
Section 10/404 Tidal Waters								
1	WAT01	E1UBL	80.084	2	Estuarine Open Water -CCSC	5/7/2021	27.834136	-97.094072
Section 404 Tidal Waters								
2	WAT02	E2USN	4.731	12	Texas Coastal Beach-Estuarine	5/7/2021	27.832123	-97.103583
TOTALS			**84.815**	**14**				

Notes: [1] Latitude/longitude recorded for the polygon centroid of the delineated water.

Below is a summary of waters delineated within the SS2 PSA:

- A total of 80.084 acres of waterbodies are located below the MHW elevation and are therefore subject to both Section 10 and Section 404 regulations. This total is comprised entirely of estuarine subtidal waterbodies (E1UBL). No estuarine subtidal aquatic beds (E1ABL) or oyster beds (E1RF2L) were observed.
- Waters that occur between the MHW and HTL elevation contours, and are therefore subject to Section 404 regulation, include 4.731 acres of estuarine intertidal unconsolidated shores (E2USN).

Table 4.5-3: Waters Delineated Within the SS1 PSA

Count	Wetland Name	Cowardin	Acres[1] within PSA	No. of Wetland Polygons	TPWD EMST Classification	Date Surveyed	Latitude[2] (DD)	Longitude[2] (DD)
Section 10/404 Tidal Waters								
1	WAT01	E1ABL	104.801	3	Estuarine Open Water-Seagrass Bed	4/29/2021; 5/4/21	27.843379	-97.099021
2	WAT01A	E1RF2L	2.322	3	Estuarine Open Water-Oysters	4/29/2021; 5/4/21	27.840299	-97.115625
3	WAT02	E1UBL	278.730	32	Estuarine Open Water-Bay	4/29/2021; 5/4/21	27.838165	-97.118086
Section 10/404 Waters Subtotal			**385.853**	**38**				
Section 404 Tidal Waters								
4	WAT03	E2USN	93.737	58	Texas Coastal Beach-Estuarine	5/3/2021-5/6/2021	27.841044	-97.109375
TOTALS			**479.590**	**96**				

Notes: [1] Acreage amounts for E1ABL (seagrass beds) were provided from survey data collected by Triton. Any minor discrepancy between seagrass acreages provided within the Triton Aquatic Resources Survey Report and the Mott MacDonald Waters and Wetlands Delineation Report can be attributed to wetland delineation data clipping out small acreages of seagrass data where these two habitat types overlap.

[2] Latitude/longitude recorded for the polygon centroid of the delineated water.

Below is a summary of waters delineated within the SS1 PSA:

- A total of 385.853 acres of waterbodies are located below the MHW elevation and are therefore subject to both Section 10 and Section 404 regulations. These include a total

of 278.730 acres of estuarine subtidal waterbodies (E1UBL), 104.801 acres of estuarine subtidal aquatic beds (E1ABL), and 2.322 acres of oyster beds (E1RF2L).

- Waters that occur between the MHW and HTL elevation contours, and are therefore subject to Section 404 regulation, include 93.737 acres of estuarine intertidal unconsolidated shores (E2USN).

Table 4.5-4: Waters Delineated Within the PA4 PSA

Count	Wetland Name	Cowardin	Acres[1] within PSA	No. of Wetland Polygons	TPWD EMST Classification	Date Surveyed	Latitude[2] (DD)	Longitude[2] (DD)
Section 10/404 Tidal Waters								
1	WAT01	E1ABL	25.126	8	Estuarine Open Water-Seagrass Bed	4/29/2021	27.845619	-97.093874
2	WAT01A	E1RF2L	0.132	2	Estuarine Open Water-Oysters	4/29/2021	27.841686	-97.091864
3	WAT02	E1UBL	98.807	33	Estuarine Open Water-Bay	4/29/2021	27.840492	-97.093726
Section 10/404 Waters Subtotal			**124.065**	**43**				
Section 404 Tidal Waters								
4	WAT03	E2USN	3.710	23	Texas Coastal Beach-Estuarine	4/28/2021	27.841592	-97.094554
Section 404 Tidal Waters Subtotal			**3.710**	**23**				
Section 404 Non-tidal Waters								
5	WAT04	PUBH	0.238	1	Palustrine -Open Water Pond	4/29/2021	27.847062	-97.088376
6	WAT05	PUBH	0.048	1	Palustrine-Open Water Pond	4/29/2021	27.845313	-97.092901
7	WAT06	PUBH	0.467	1	Palustrine -Open Water Pond	4/28/2021	27.844542	-97.093067
Section 404 Non-tidal Waters Subtotal			**0.753**	**3**				
TOTALS			**128.528**	**69**				

Notes: [1] *Acreage amounts for E1ABL (seagrass beds) were provided from survey data collected by Triton. Any minor discrepancy between seagrass acreages provided within the Triton Aquatic Resources Survey Report and the Mott MacDonald Waters and Wetlands Delineation Report can be attributed to wetland delineation data clipping out small acreages of seagrass data where these two habitat types overlap.*

[2] *Latitude/longitude recorded for the polygon centroid of the delineated water.*

Below is a summary of waters delineated within the PA4 PSA:

- A total of 124.065 acres of waterbodies are located below the MHW elevation and are therefore subject to both Section 10 and Section 404 regulations. These include a total of 98.807 acres of estuarine subtidal waterbodies (E1UBL), 25.126 acres of estuarine subtidal aquatic beds (E1ABL), and 0.132 acres of oyster beds (E1RF2L).
- Waters that occur between the MHW and HTL elevation contours, and are therefore subject to Section 404 regulation, include 3.710 acres of estuarine intertidal unconsolidated shores (E2USN).
- Non-tidal waters that are potentially subject to Section 404 regulation include 3 excavated inland ponds (PUBH) that occur behind levee berms. These man-made, non-tidal ponds account for 0.753 acres total.

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Table 4.5-5: Waters Delineated Within the MI PSA

Count	Wetland Name	Cowardin	Acres within PSA	No. of Wetland Polygons	TPWD EMST Classification	Date Surveyed	Latitude[1] (DD)	Longitude[1] (DD)
Section 10/404 Tidal Waters								
1	WAT01	M1UBL	9.502	1	Marine Open Water -CCSC	6/11/2021	27.804949	-97.073303
2	WAT02	M1UBL	471.475	1	Marine Open Water -Gulf of Mexico	6/11/2021	27.835285	-97.044902
Section 10/404 Waters Subtotal			**480.977**	**2**				
Section 404 Tidal Waters								
3	WAT03	M2USN	44.663	1	Texas Coastal Beach-Marine	6/11/2021	27.8074399	-97.069495
TOTALS			**525.640**	**3**				

Notes: [1] Latitude/longitude recorded for the polygon centroid of the delineated water.

Below is a summary of waters delineated within the MI PSA:

- A total of 480.977 acres of marine subtidal waterbodies (M1UBL) are located below the MHW elevation and are therefore subject to both Section 10 and Section 404 regulations.
- Waters that occur between the MHW and HTL elevation contours, and are therefore subject to Section 404 regulation, include 44.663 acres of marine intertidal unconsolidated shores (M2USN).

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4.6 Summary Tables of Wetlands Delineated Within the Five PSAs

The following tables list estuarine and palustrine wetlands identified at each of the five PSAs.

Table 4.6-1: Wetlands Delineated Within the HI-E PSA

Count	Wetland Name	Cowardin	Acres Within PSA	No. of Wetland Polygons	TPWD EMST Classification	Date Surveyed	Latitude[1] (DD)	Longitude[1] (DD)
Section 10/404 Wetlands								
1	WET01A	E2EM1N	0.368	11	Coastal: Salt and Brackish Low Tidal Marsh	5/18/2021; 5/20/2021	27.85449	-97.067128
2	WET02A	E2SS3N	2.538	39	Coastal: Mangrove Shrubland	5/18/2021; 5/20/2021	27.85797	-97.061372
3	WET04A	E2EM1N1	0.024	10	Texas Salt and Brackish Tidal Flats	5/24/2021	27.858017	-97.071134
Section 10/404 Subtotal			**2.930**	**60**				
Section 404 Tidal Wetlands								
4	WET01	E2EM1N	0.056	9	Coastal: Salt and Brackish Low Tidal Marsh	5/18/2021; 5/20/2021	27.85441	-97.066951
5	WET02	E2SS3N	19.827	26	Coastal: Mangrove Shrubland	5/18/2021; 5/20/2021	27.85797	-97.061372
6	WET03	E2ABN	15.814	7	South Texas: Algal Flats	5/18/2021; 5/24/2021	27.857624	-97.066790
7	WET03A	E2ABM	0.276	4	South Texas: Algal Flats	5/18/2021; 5/24/2021	27.856694	-97.064918
8	WET04	E2EM1N1	3.319	3	Texas Salt and Brackish Tidal Flats	5/18/2021	27.858456	-97.070303
9	WET05	E2EM1P	0.558	4	Coastal: Salt and Brackish High Tidal Marsh	5/24/2021	27.859022	-97.070167
10	WET06	E2EM1P	0.228	5	Coastal: Salt and Brackish High Tidal Marsh	5/18/2021	27.858343	-97.069333
11	WET06A	E2EM1N1	0.159	2	Texas Salt and Brackish Tidal Flats	5/18/2021	27.858343	-97.069333
12	WET07	E2EM1P	0.135	14	Coastal: Salt and Brackish High Tidal Marsh	5/20/2021	27.857292	-97.067633
13	WET07A	E2EM1N1	5.637	9	Texas Salt and Brackish Tidal Flats	5/18/2021; 5/20/2021	27.857292	-97.067633
14	WET08	E2EM1P	0.643	5	Coastal: Salt and Brackish High Tidal Marsh	5/18/2021	27.858710	-97.067782
15	WET08A	E2EM1N1	0.059	1	Texas Salt and Brackish Tidal Flats	5/18/2021	27.858710	-97.067782
16	WET09	E2EM1P	1.903	3	Coastal: Salt and Brackish High Tidal Marsh	5/20/2021; 5/24/2021	27.857117	-97.068005
17	WET10	E2EM1P	2.716	9	Coastal: Salt and Brackish High Tidal Marsh	5/20/2021; 5/24/2021	27.855480	-97.066186
18	WET11	E2EM1P	3.363	5	Coastal: Salt and Brackish High Tidal Marsh	5/20/2021	27.856195	-97.060537
19	WET12	E2EM1N1	0.342	6	Texas Salt and Brackish Tidal Flats	5/18/2021	27.858365	-97.067253
20	WET13	E2EM1P	0.175	2	Coastal: Salt and Brackish High Tidal Marsh	5/20/2021	27.857409	-97.063456
21	WET14	E2EM1N1	6.509	10	Texas Salt and Brackish Tidal Flats	5/20/2021	27.857991	-97.063066
22	WET15	E2EM1P	0.440	1	Coastal: Salt and Brackish High Tidal Marsh	5/20/2021	27.856623	-97.058942

Count	Wetland Name	Cowardin	Acres Within PSA	No. of Wetland Polygons	TPWD EMST Classification	Date Surveyed	Latitude[1] (DD)	Longitude[1] (DD)
23	WET15A	E2EM1N1	2.131	6	Texas Salt and Brackish Tidal Flats	5/20/2021	27.856623	-97.058942
24	WET16	E2EM1P	0.001	1	Coastal: Salt and Brackish High Tidal Marsh	5/20/2021	27.853972	-97.060416
Section 404 Tidal Subtotal			**64.291**	**132**				
Section 404 Non-tidal Wetlands								
25	WET02B	PSS3C	0.005	5	Coastal: Mangrove Shrubland	5/18/2021; 5/20/2021	27.856457	-97.058481
26	WET04B	PEM1C1	0.006	2	Texas Salty Prairie	5/18/2021	27.858456	-97.070303
27	WET05B	PEM1C	1.472	1	Texas Saline Coastal Prairie	5/24/2021	27.859022	-97.070168
28	WET06B	PEM1C	0.115	4	Texas Saline Coastal Prairie	5/18/2021	27.858343	-97.069333
29	WET06C	PEM1C1	0.006	4	Texas Salty Prairie	5/18/2021	27.858343	-97.069333
30	WET07B	PEM1C	0.150	5	Texas Saline Coastal Prairie	5/20/2021	27.857292	-97.067633
31	WET07C	PEM1C1	0.050	18	Texas Salty Prairie	5/18/2021	27.857292	-97.067633
32	WET08B	PEM1C	0.848	2	Texas Saline Coastal Prairie	5/18/2021	27.858710	-97.067782
33	WET08C	PEM1C1	0.001	1	Texas Salty Prairie	5/18/2021	27.858710	-97.067782
34	WET09B	PEM1C	2.491	3	Texas Saline Coastal Prairie	5/20/2021; 5/24/2021	27.857117	-97.068005
35	WET10B	PEM1C	14.950	4	Texas Saline Coastal Prairie	5/20/2021	27.855480	-97.066186
36	WET11B	PEM1C	28.643	1	Texas Saline Coastal Prairie	5/18/2021	27.856195	-97.060537
37	WET11C	PSS1C	0.258	1	Non-native Invasive Brazilian Peppertree Shrubland	5/20/2021	27.856195	-97.060537
38	WET12B	PEM1C1	0.062	2	Texas Salty Prairie	5/20/2021	27.858365	-97.067253
39	WET13B	PEM1C	0.811	1	Texas Saline Coastal Prairie	5/20/2021	27.857409	-97.063456
40	WET14B	PEM1C1	0.001	1	Texas Salty Prairie	5/20/2021	27.857991	-97.063066
41	WET16B	PEM1C	0.765	1	Texas Saline Coastal Prairie	5/20/2021	27.853972	-97.060416
Section 404 Non-tidal Subtotal			**50.634**	**56**				
TOTALS			**117.855**	**248**				

Notes: [1] Latitude/longitude recorded for the polygon centroid of the delineated wetland.

Below is a summary of wetlands delineated within the HI-E PSA:

- A total of 2.930 acres of estuarine wetlands are located below the MHW elevation and are therefore subject to both Section 10 and Section 404 regulations. These include 0.368 acres of emergent low marsh (E2EM1N), 0.024 acres of estuarine emergent low marsh hyperhaline *Salicornia* flats (E2EM1N1), and 2.538 acres of estuarine scrub shrub black mangroves (E2SS3N).
- Estuarine wetlands subject to Section 404 jurisdiction (i.e., tidally influenced wetlands occurring between MHW and HTL elevations) occupy 64.291 acres. Tidal wetlands subject to Section 404 only include 0.056 acres of emergent low marsh (E2EM1N), 18.156 acres of estuarine emergent low marsh hyperhaline *Salicornia* flats (E2EM1N1), 10.162 acres of emergent high marsh (E2EM1P), 19.827 acres of estuarine scrub shrub black mangroves (E2SS3N), 15.814 acres of estuarine aquatic bed algal flats (E2ABN), and 0.276 acres of estuarine aquatic bed algal depressions (E2ABM).
- Non-tidal, palustrine wetlands subject to Section 404 account for 50.634 acres which include 50.245 acres of palustrine emergent coastal prairie wetlands and sea ox-eye daisy flats (PEM1C), 0.125 acres of palustrine emergent hyperhaline *Salicornia* flats

(PEM1C1), and 0.258 acres of palustrine scrub shrub non-native Brazilian peppertree wetlands (PSS1C).

Table 4.6-2: Wetlands Delineated Within the SS2 PSA

Count	Wetland Name	Cowardin	Acres Within PSA	No. of Wetland Polygons	TPWD EMST Classification	Date Surveyed	Latitude[1] (DD)	Longitude[1] (DD)
Section 10/404 Wetlands								
1	WET02A	E2EM1N	0.001	1	Coastal: Salt and Brackish Low Tidal Marsh	5/13/2021	27.833128	-97.088195
2	WET03A	E2SS3N	0.003	4	Coastal: Mangrove Shrubland	5/13/2021	27.833572	-97.089442
Section 10/404 Wetlands Subtotal			**0.004**	**5**				
Section 404 Tidal Wetlands								
3	WET01	E2ABN	57.869	5	South Texas: Algal Flats	5/11/2021; 5/14/2021	27.830032	-97.099284
4	WET01A	E2ABM	2.563	2	South Texas: Algal Flats	5/11/2021; 5/14/2021	27.831857	-97.094924
5	WET02	E2EM1N	0.154	11	Coastal: Salt and Brackish Low Tidal Marsh	5/11/2021; 5/14/2021	27.829359	-97.099008
6	WET03	E2SS3N	3.038	51	Coastal: Mangrove Shrubland	5/11/2021; 5/14/2021	27.833422	-97.089631
7	WET06	E2EM1P	0.099	3	Coastal: Salt and Brackish High Tidal Marsh	5/11/2021	27.833187	-97.085632
8	WET07	E2EM1N1	0.766	3	Texas Salt and Brackish Tidal Flats	5/11/2021	27.832760	-97.085728
9	WET08	E2EM1P	0.026	1	Coastal: Salt and Brackish High Tidal Marsh	5/11/2021	27.832785	-97.085119
10	WET10	E2EM1P	0.001	1	Coastal: Salt and Brackish High Tidal Marsh	5/11/2021	27.832267	-97.086373
11	WET11	E2EM1N1	0.009	8	Texas Salt and Brackish Tidal Flats	5/11/2021	27.832028	-97.086359
12	WET12	E2EM1N1	0.007	1	Texas Salt and Brackish Tidal Flats	5/11/2021	27.831849	-97.086607
13	WET13	E2EM1N1	1.760	44	Texas Salt and Brackish Tidal Flats	5/11/2021; 5/13/2021	27.832138	-97.088162
14	WET14	E2EM1N1	0.011	1	Texas Salt and Brackish Tidal Flats	5/11/2021	27.831745	-97.087298
15	WET15	E2EM1N1	0.283	1	Texas Salt and Brackish Tidal Flats	5/13/2021	27.831989	-97.088597
16	WET16	E2EM1P	0.075	4	Coastal: Salt and Brackish High Tidal Marsh	5/13/2021	27.832966	-97.088618
17	WET17	E2EM1N1	0.120	1	Texas Salt and Brackish Tidal Flats	5/13/2021	27.832144	-97.089217
18	WET18	E2EM1N1	0.972	1	Texas Salt and Brackish Tidal Flats	5/13/2021	27.831354	-97.089992
19	WET19	E2EM1N1	0.011	2	Texas Salt and Brackish Tidal Flats	5/13/2021	27.830744	-97.090660
20	WET20	E2EM1N1	1.342	14	Texas Salt and Brackish Tidal Flats	5/13/2021; 5/14/2021	27.830860	-97.092840
21	WET21	E2EM1P	0.523	8	Coastal: Salt and Brackish High Tidal Marsh	5/13/2021	27.832626	-97.092631
22	WET22	E2EM1P	0.135	5	Coastal: Salt and Brackish High Tidal Marsh	5/14/2021	27.831643	-97.094045

Count	Wetland Name	Cowardin	Acres Within PSA	No. of Wetland Polygons	TPWD EMST Classification	Date Surveyed	Latitude[1] (DD)	Longitude[1] (DD)
23	WET23	E2EM1P	0.693	15	Coastal: Salt and Brackish High Tidal Marsh	5/13/2021; 5/14/2021	27.831620	-97.097038
24	WET24	E2EM1N1	0.757	10	Texas Salt and Brackish Tidal Flats	5/14/2021	27.830957	-97.095014
25	WET25	E2EM1N1	0.197	3	Texas Salt and Brackish Tidal Flats	5/14/2021	27.830489	-97.097567
26	WET26	E2EM1N1	0.108	2	Texas Salt and Brackish Tidal Flats	5/14/2021	27.829354	-97.099405
27	WET26A	E2EM1P	0.016	5	Coastal: Salt and Brackish High Tidal Marsh	5/14/2021	27.829354	-97.099405
28	WET29	E2EM1N1	1.868	17	Texas Salt and Brackish Tidal Flats	5/7/2021; 5/14/2021	27.830074	-97.103033
29	WET29A	E2EM1P	0.063	6	Coastal: Salt and Brackish High Tidal Marsh	5/7/2021; 5/14/2021	27.830074	-97.103033
30	WET30	E2EM1N1	0.219	2	Texas Salt and Brackish Tidal Flats	5/14/2021	27.831595	-97.102716
31	WET31	E2EM1P	0.508	2	Coastal: Salt and Brackish High Tidal Marsh	5/14/2021	27.830941	-97.103272
32	WET32	E2EM1N1	0.158	1	Texas Salt and Brackish Tidal Flats	5/7/2021	27.829021	-97.103422
33	WET32A	E2EM1P	0.131	1	Coastal: Salt and Brackish High Tidal Marsh	5/7/2021	27.829021	-97.103422
34	WET33	E2EM1P	0.012	1	Coastal: Salt and Brackish High Tidal Marsh	5/11/2021	27.834285	-97.089453
Section 404 Tidal Wetlands Subtotal			**74.495**	**232**				
Section 404 Non-tidal Wetlands								
35	WET03B	PSS3C	0.738	20	Coastal: Mangrove Shrubland	5/11/2021; 5/14/2021	27.832139	-97.087044
36	WET04	PEM1C	1.723	1	Texas Saline Coastal Prairie	5/11/2021	27.834298	-97.085633
37	WET05	PEM1C	0.234	1	Texas Saline Coastal Prairie	5/11/2021	27.833342	-97.085150
38	WET06B	PEM1C	0.937	1	Texas Saline Coastal Prairie	5/11/2021	27.833187	-97.085632
39	WET06C	PEM1C1	0.022	2	Texas Salty Prairie	5/11/2021	27.833045	-97.085086
40	WET08B	PEM1C	0.162	3	Texas Saline Coastal Prairie	5/11/2021	27.832785	-97.085119
41	WET08C	PEM1C1	<0.001	1	Texas Salty Prairie	5/11/2021	27.832977	-97.085028
42	WET09	PEM1C	0.046	7	Texas Saline Coastal Prairie	5/11/2021	27.832070	-97.085651
43	WET09B	PEM1C1	0.029	1	Texas Salty Prairie	5/11/2021	27.832070	-97.085651
44	WET10B	PEM1C	0.011	1	Texas Saline Coastal Prairie	5/11/2021	27.832267	-97.086373
45	WET11B	PEM1C1	0.281	13	Texas Salty Prairie	5/11/2021	27.832028	-97.086359
46	WET12B	PEM1C1	0.043	8	Texas Salty Prairie	5/11/2021	27.831849	-97.086607
47	WET13B	PEM1C1	0.367	13	Texas Salty Prairie	5/11/2021; 5/13/2021	27.832138	-97.088162
48	WET16B	PEM1C	0.168	2	Texas Saline Coastal Prairie	5/13/2021	27.832966	-97.088618
49	WET16C	PEM1C1	0.005	2	Texas Salty Prairie	5/13/2021	27.832966	-97.088618

Count	Wetland Name	Cowardin	Acres Within PSA	No. of Wetland Polygons	TPWD EMST Classification	Date Surveyed	Latitude[1] (DD)	Longitude[1] (DD)
50	WET21B	PEM1C	6.730	2	Texas Saline Coastal Prairie	5/13/2021	27.832626	-97.092631
51	WET21C	PEM1C1	0.502	11	Texas Salty Prairie	5/13/2021	27.832626	-97.092631
52	WET22B	PEM1C	0.676	3	Texas Saline Coastal Prairie	5/14/2021	27.831643	-97.094045
53	WET23B	PEM1C	7.548	1	Texas Saline Coastal Prairie	5/13/2021	27.831620	-97.097038
54	WET23C	PEM1C1	0.145	1	Texas Salty Prairie	5/13/2021	27.831620	-97.097038
55	WET24B	PEM1C1	0.347	10	Texas Salty Prairie	5/14/2021	27.830957	-97.095014
56	WET26B	PEM1C	0.170	1	Texas Saline Coastal Prairie	5/14/2021	27.829354	-97.099405
57	WET26C	PEM1C1	0.054	5	Texas Salty Prairie	5/14/2021	27.829354	-97.099405
58	WET27	PEM1C	0.076	1	Texas Saline Coastal Prairie	5/14/2021	27.829663	-97.100413
59	WET28	PEM1C	0.099	1	Texas Saline Coastal Prairie	5/14/2021	27.831913	-97.102054
60	WET28B	PEM1C1	0.016	1	Texas Salty Prairie	5/14/2021	27.831913	-97.102054
61	WET29B	PEM1C	0.088	4	Texas Saline Coastal Prairie	5/7/2021; 5/14/2021	27.830074	-97.103033
62	WET29C	PEM1C1	0.027	4	Texas Salty Prairie	5/7/2021; 5/14/2021	27.830074	-97.103033
63	WET30B	PEM1C1	0.413	3	Texas Salty Prairie	5/14/2021	27.831595	-97.102716
64	WET31B	PEM1C	1.427	1	Texas Saline Coastal Prairie	5/14/2021	27.830941	-97.103272
65	WET32B	PEM1C	0.023	2	Texas Saline Coastal Prairie	5/7/2021	27.829021	-97.103422
66	WET33B	PEM1C	0.121	1	Texas Saline Coastal Prairie	5/11/2021	27.834285	-97.089453
67	WET34	PEM1C	0.017	1	Texas Saline Coastal Prairie	5/11/2021	27.834562	-97.089438
68	WET35	PEM1C	0.009	1	Texas Saline Coastal Prairie	5/11/2021	27.834385	-97.089231
69	WET36	PEM1C	0.045	1	Texas Saline Coastal Prairie	5/11/2021	27.834177	-97.089110
Section 404 Non-tidal Wetlands Subtotal			**23.299**	**131**				
TOTALS			**97.798**	**368**				

Notes: [1] Latitude/longitude recorded for the polygon centroid of the delineated wetland.

Below is a summary of wetlands delineated within the SS2 PSA:

- A total of 0.004 acres of estuarine wetlands are located below the MHW elevation and are therefore subject to both Section 10 and Section 404 regulations. These include 0.001 acres of emergent low marsh (E2EM1N) and 0.003 acres of estuarine scrub shrub black mangroves (E2SS3N).
- Estuarine wetlands subject to Section 404 jurisdiction (i.e., tidally influenced wetlands occurring between MHW and HTL elevations) occupy 74.494 acres. Tidal wetlands subject to Section 404 only include 0.154 acres of emergent low marsh (E2EM1N), 8.588 acres of estuarine emergent low marsh hyperhaline *Salicornia* flats (E2EM1N1), 2.283 acres of emergent high marsh (E2EM1P), 3.038 acres of estuarine scrub shrub black

mangroves (E2SS3N), 57.869 acres of estuarine aquatic bed algal flats (E2ABN), and 2.563 acres of estuarine aquatic bed algal depressions (E2ABM).

- Non-tidal, palustrine wetlands subject to Section 404 account for 23.299 acres which include 20.309 acres of palustrine emergent coastal prairie wetlands and sea ox-eye daisy flats (PEM1C), 2.252 acres of palustrine emergent hyperhaline *Salicornia* flats (PEM1C1), and 0.738 acres of palustrine scrub shrub black mangrove wetlands (PSS3C).

Table 4.6-3: Wetlands Delineated Within the SS1 PSA

Count	Wetland Name	Cowardin	Acres within PSA	No. of Wetland Polygons	TPWD EMST Classification	Date Surveyed	Latitude[1] (DD)	Longitude[1] (DD)
Section 10/404 Wetlands								
1	WET01A	E2EM1N	3.868	47	Coastal: Salt and Brackish Low Tidal Marsh	5/5/2021-5/7/2021	27.842664	-97.105935
2	WET03A	E2SS3N	0.942	23	Coastal: Mangrove Shrubland	4/29/2021	27.842252	-97.099475
Section 10/404 Wetlands Subtotal			**4.810**	**70**				
Section 404 Tidal Wetlands								
3	WET01	E2EM1N	1.847	86	Coastal: Salt and Brackish Low Tidal Marsh	5/5/2021-5/7/2021	27.842664	-97.105935
4	WET02	E2ABN	15.985	8	South Texas: Algal Flat	5/4/2021	27.840760	-97.126431
5	WET02A	E2ABM	1.462	2	South Texas: Algal Flat	5/4/2021	27.840760	-97.126431
6	WET03	E2SS3N	4.802	12	Coastal: Mangrove Shrubland	4/29/2021	27.842252	-97.099475
7	WET05	E2EM1P	0.103	3	Coastal: Salt and Brackish High Tidal Marsh	5/4/2021	27.842137	-97.098766
8	WET06	E2EM1P	2.048	4	Coastal: Salt and Brackish High Tidal Marsh	6/11/2021	27.829768	-97.052446
9	WET07	E2EM1P	1.314	3	Coastal: Salt and Brackish High Tidal Marsh	5/4/2021-5/5-2021	27.841652	-97.104110
10	WET08	E2EM1P	3.513	5	Coastal: Salt and Brackish High Tidal Marsh	5/6/2021	27.841235	-97.108255
11	WET09	E2EM1P	1.126	3	Coastal: Salt and Brackish High Tidal Marsh	5/6/2021	27.840103	-97.110632
12	WET11	E2EM1N1	0.177	6	Texas Salt and Brackish Tidal Flats	5/7/2021	27.839751	-97.114210
13	WET12	E2EM1N1	2.469	6	Texas Salt and Brackish Tidal Flats	5/4/2021-5/7/2021	27.839626	-97.120221
14	WET15	E2EM1N1	0.668	12	Coastal: Salt and Brackish Low Tidal Marsh	5/6/2021	27.839579	-97.121490
15	WET16	E2EM1P	0.475	48	Coastal: Salt and Brackish High Tidal Marsh	5/3/2021	27.838239	-97.124300
16	WET17	E2EM1P	0.139	14	Coastal: Salt and Brackish High Tidal Marsh	5/6/2021	27.838623	-97.122135
17	WET18	E2EM1P	0.308	23	Coastal: Salt and Brackish High Tidal Marsh	5/5/2021-5/6/2021	27.838276	-97.124433
18	WET21	E2EM1N1	0.127	6	Texas Salt and Brackish Tidal Flats	5/5/2021	27.838984	-97.125993
19	WET22	E2EM1P	0.014	3	Coastal: Salt and Brackish High Tidal Marsh	5/3/2021	27.838373	-97.125688
20	WET23	E2EM1N1	1.254	12	Texas Salt and Brackish Tidal Flats	5/3/2021; 5/5/2021	27.839036	-97.126725

Count	Wetland Name	Cowardin	Acres within PSA	No. of Wetland Polygons	TPWD EMST Classification	Date Surveyed	Latitude[1] (DD)	Longitude[1] (DD)
21	WET24	E2EM1P	0.585	4	Coastal: Salt and Brackish High Tidal Marsh	5/4/2021	27.843998	-97.125072
22	WET25	E2EM1N1	0.256	7	Texas Salt and Brackish Tidal Flats	5/3/2021; 5/5/2021	27.839368	-97.128467
23	WET26	E2EM1P	0.155	4	Coastal: Salt and Brackish High Tidal Marsh	5/3/2021; 5/5/2021	27.840735	-97.125970
24	WET27	E2EM1N1	0.545	2	Texas Salt and Brackish Tidal Flats	5/4/2021	27.842360	-97.124669
25	WET28	E2EM1P	1.108	13	Coastal: Salt and Brackish High Tidal Marsh	5/3/2021; 5/4/2021	27.840809	-97.127572
26	WET29	E2EM1P	0.162	9	Coastal: Salt and Brackish High Tidal Marsh	5/4/2021; 5/5/2021	27.841161	-97.125833
Section 404 Tidal Wetlands Subtotal			**40.642**	**295**				
Section 404 Non-tidal Wetlands								
27	WET03B	PSS3C	0.017	4	Coastal: Mangrove Shrubland	4/29/2021	27.844304	-97.124921
28	WET04	PEM1C	0.967	2	Coastal: Sea-Ox Eye Daisy Flats	5/4/2021	27.841306	-97.100509
29	WET06B	PEM1C	6.426	4	Coastal: Sea-Ox Eye Daisy Flats	6/11/2021	27.829768	-97.052446
30	WET09B	PEM1C	0.667	2	Coastal: Sea-Ox Eye Daisy Flats	5/6/2021	27.840103	-97.110632
31	WET10	PEM1C	6.114	2	Coastal: Sea-Ox Eye Daisy Flats	5/7/2021	27.838974	-97.057388
32	WET11B	PEM1C	0.018	2	Texas Saline Coastal Prairie	5/7/2021	27.839751	-97.114210
33	WET12B	PEM1C1	0.107	6	Texas Saline Coastal Prairie	5/4/2021-5/7/2021	27.839626	-97.120221
34	WET13	PEM1C	0.028	2	Texas Saline Coastal Prairie	5/7/2021	27.838724	-97.116648
35	WET14	PEM1C	0.106	2	Texas Saline Coastal Prairie	5/6/2021	27.838849	-97.118637
36	WET15B	PEM1C	0.011	1	Texas Saline Coastal Prairie	5/6/2021	27.839579	-97.121490
37	WET16B	PEM1C	11.488	3	Texas Saline Coastal Prairie	5/3/2021	27.838239	-97.124300
38	WET17B	PEM1C	0.030	7	Texas Saline Coastal Prairie	5/6/2021	27.838623	-97.122135
39	WET18B	PEM1C	0.503	11	Texas Saline Coastal Prairie	5/5/2021-5/6/2021	27.838276	-97.124433
40	WET19	PEM1C	0.124	3	Texas Saline Coastal Prairie	5/3/2021; 5/5/2021	27.838022	-97.124654
41	WET20	PEM1C	3.797	7	Coastal: Sea-Ox Eye Daisy Flats	5/3/2021	27.839004	-97.128069
42	WET21B	PEM1C	0.042	3	Texas Saline Coastal Prairie	5/5/2021	27.838984	-97.125993
43	WET22B	PEM1C	0.023	3	Texas Saline Coastal Prairie	5/3/2021	27.838373	-97.125688
44	WET23B	PEM1C1	0.083	2	Texas Salty Prairie	5/3/2021; 5/5/2021	27.839036	-97.126725
45	WET24B	PEM1C	0.199	2	Texas Saline Coastal Prairie	5/4/2021	27.843998	-97.125072

Count	Wetland Name	Cowardin	Acres within PSA	No. of Wetland Polygons	TPWD EMST Classification	Date Surveyed	Latitude[1] (DD)	Longitude[1] (DD)
46	WET25B	PEM1C1	0.103	6	Texas Salty Prairie	5/3/2021; 5/5/2021	27.839368	-97.128467
47	WET28B	PEM1C	1.720	7	Texas Saline Coastal Prairie	5/3/2021; 5/4/2021	27.840809	-97.127572
48	WET29B	PEM1C	0.133	6	Texas Saline Coastal Prairie	5/4/2021; 5/5/2021	27.841161	-97.125833
Section 404 Non-tidal Wetlands Subtotal			**32.706**	**87**				
TOTALS			**78.158**	**452**				

Notes: [1] Latitude/longitude recorded for the polygon centroid of the delineated wetland.

Below is a summary of wetlands delineated within the SS1 PSA:

- A total of 4.810 acres of estuarine wetlands are located below the MHW elevation and are therefore subject to both Section 10 and Section 404 regulations. These include 3.868 acres of emergent low marsh (E2EM1N) and 0.942 acres of estuarine scrub shrub black mangroves (E2SS3N).
- Estuarine wetlands subject to Section 404 jurisdiction (i.e., tidally influenced wetlands occurring between MHW and HTL elevations) occupy 40.642 acres. Tidal wetlands subject to Section 404 only include 1.847 acres of emergent low marsh (E2EM1N), 5.496 acres of estuarine emergent low marsh hyperhaline *Salicornia* flats (E2EM1N1), 11.050 acres of emergent high marsh (E2EM1P), 4.802 acres of estuarine scrub shrub black mangroves (E2SS3N), 15.985 acres of estuarine aquatic bed algal flats (E2ABN), and 1.462 acres of estuarine aquatic bed algal depressions (E2ABM).
- Non-tidal, palustrine wetlands subject to Section 404 account for 32.706 acres which include 32.395 acres of palustrine emergent coastal prairie wetlands and sea ox-eye daisy flats (PEM1C), 0.294 acres of palustrine emergent hyperhaline *Salicornia* flats (PEM1C1), and 0.017 acres of palustrine scrub shrub black mangrove wetlands (PSS3C).

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Table 4.6-4: Wetlands Delineated Within the PA4 PSA

Count	Wetland Name	Cowardin	Acres within PSA	No. of Wetland Polygons	TPWD EMST Classification	Date Surveyed	Latitude[1] (DD)	Longitude[1] (DD)
Section 10/404 Wetlands								
1	WET01A	E2EM1N	0.401	24	Coastal: Salt and Brackish Low Tidal Marsh	4/29/2021	27.848385	-97.087702
2	WET03A	E2SS3N	10.248	19	Coastal: Mangrove Shrubland	4/29/2021	27.843479	-97.096896
Section 10/404 Wetlands Subtotal			**10.649**	**43**				
Section 404 Tidal Wetlands								
3	WET01	E2EM1N	0.023	3	Coastal: Salt and Brackish Low Tidal Marsh	4/29/2021	27.848385	-97.087702
4	WET02	E2EM1P	2.145	12	Coastal: Salt and Brackish High Tidal Marsh	4/29/2021	27.848310	-97.089222
5	WET03	E2SS3N	2.607	16	Coastal: Mangrove Shrubland	4/29/2021	27.843479	-97.096896
Section 404 Tidal Wetlands Subtotal			**4.775**	**31**				
Section 404 Non-tidal Wetlands								
6	WET03B	PSS3C	0.114	10	Coastal: Mangrove Shrubland	4/29/2021	27.843479	-97.096896
7	WET04	PEM1C	0.058	2	Coastal: Sea Ox-Eye Daisy Flats	4/29/2021	27.847921	-97.087070
8	WET05	PEM1C	0.130	1	Coastal: Sea Ox-Eye Daisy Flats	4/29/2021	27.847380	-97.087882
9	WET06	PEM1C	25.961	6	Coastal: Sea Ox-Eye Daisy Flats	4/28/2021	27.844964	-97.087888
10	WET06A	PSS1C	1.022	1	Non-Native Invasive Brazilian Pepper Tree Shrubland	4/28/2021	27.844964	-97.087888
11	WET06B	PEM1C1	2.648	9	Texas Salty Prairie	4/28/2021	27.844964	-97.087888
12	WET07	PEM1C	8.740	4	Coastal: Sea Ox-Eye Daisy Flats	4/28/2021	27.843872	-97.092556
13	WET07A	PSS1C	1.860	6	Non-Native Invasive Brazilian Pepper Tree Shrubland	4/28/2021	27.843872	-97.092556
14	WET07B	PEM1C1	2.107	4	Texas Salty Prairie	4/28/2021	27.843872	-97.092556
15	WET08	PEM1C	0.617	1	Coastal: Sea Ox-Eye Daisy Flats	4/28/21	27.845137	-97.093049
16	WET08A	PSS1C	0.141	7	Non-Native Invasive Brazilian Pepper Tree Shrubland	4/28/21	27.845137	-97.093049
17	WET08B	PEM1C1	0.242	3	Texas Salty Prairie	4/28/21	27.845137	-97.093049
18	WET09	PEM1C	1.199	7	Coastal: Sea Ox-Eye Daisy Flats	5/3/2021	27.843373	-97.096242
19	WET10	PEM1C	0.698	1	Coastal: Sea Ox-Eye Daisy Flats	5/3/2021	27.841501	-97.099170
Section 404 Non-tidal Wetlands Subtotal			45.537	62				
TOTALS			**60.961**	**136**				

Notes: [1] Latitude/longitude recorded for the polygon centroid of the delineated wetland.

Below is a summary of wetlands delineated within the PA4 PSA:

- A total of 10.649 acres of estuarine wetlands are located below the MHW elevation and are therefore subject to both Section 10 and Section 404 regulations. These include 0.401

acres of emergent low marsh (E2EM1N) and 10.248 acres of estuarine scrub shrub black mangroves (E2SS3N).

- Estuarine wetlands subject to Section 404 jurisdiction (i.e., tidally influenced wetlands occurring between MHW and HTL elevations) occupy 4.775 acres. Tidal wetlands subject to Section 404 only include 0.023 acres of emergent low marsh (E2EM1N), 2.145 acres of emergent high marsh (E2EM1P), and 2.607 acres of estuarine scrub shrub black mangroves (E2SS3N).
- Non-tidal, palustrine wetlands subject to Section 404 account for 45.537 acres which include 37.403 acres of palustrine emergent coastal prairie wetlands and sea ox-eye daisy flats (PEM1C), 4.997 acres of palustrine emergent hyperhaline *Salicornia* flats (PEM1C1), 0.114 acres of palustrine scrub shrub black mangrove wetlands (PSS3C), and 3.023 acres of palustrine scrub shrub non-native Brazilian peppertree wetlands.

Table 4.6-5: Wetlands Delineated Within the MI PSA

Count	Wetland Name	Cowardin	Acres within PSA	No. of Wetland Polygons	TPWD EMST Classification	Date Surveyed	Latitude[1] (DD)	Longitude[1] (DD)
Section 404 Non-tidal Wetlands								
1	WET01	PEM1C	2.428	4	Coastal Plain Interdunal Wetland	6/11/2021	27.834667	-97.048360
2	WET02	PEM1C	0.060	1	Coastal Plain Interdunal Wetland	6/11/2021	27.834521	-97.048134
3	WET03	PEM1C	0.030	1	Coastal Plain Interdunal Wetland	6/11/2021	27.834331	-97.048108
4	WET04	PEM1C	2.468	1	Coastal Plain Interdunal Wetland	6/11/2021	27.830126	-97.052614
5	WET05	PEM1C	1.342	1	Coastal Plain Interdunal Wetland	6/11/2021	27.830323	-97.053294
6	WET06	PEM1C	0.084	1	Coastal Plain Interdunal Wetland	6/11/2021	27.829768	-97.052446
7	WET07	PEM1C	0.019	1	Coastal Plain Interdunal Wetland	6/11/2021	27.829475	-97.052710
8	WET08	PEM1C	0.442	1	Coastal Plain Interdunal Wetland	6/11/2021	27.828956	-97.053913
9	WET09	PEM1C	1.912	1	Coastal Plain Interdunal Wetland	6/11/2021	27.828561	-97.054806
10	WET10	PEM1C	7.954	1	Coastal Plain Interdunal Wetland	6/11/2021	27.825347	-97.057388
11	WET11	PEM1C	0.009	1	Coastal Plain Interdunal Wetland	6/11/2021	27.822756	-97.059614
12	WET12	PEM1C	4.098	2	Coastal Plain Interdunal Wetland	6/11/2021	27.817322	-97.064801
13	WET13	PEM1C	0.525	1	Coastal Plain Interdunal Wetland	6/11/2021	27.817322	-97.064801
14	WET14	PEM1C	0.012	1	Coastal Plain Interdunal Wetland	6/11/2021	27.816690	-97.065468
15	WET15	PEM1C	0.104	2	Coastal Plain Interdunal Wetland	6/11/2021	27.815857	-97.066019
16	WET16	PEM1C	0.076	1	Coastal Plain Interdunal Wetland	6/11/2021	27.815432	-97.066488
17	WET17	PEM1C	0.037	1	Coastal Plain Interdunal Wetland	6/11/2021	27.814007	-97.067787
18	WET18	PEM1C	0.082	1	Coastal Plain	6/11/2021	27.813702	-97.068025

Count	Wetland Name	Cowardin	Acres within PSA	No. of Wetland Polygons	TPWD EMST Classification	Date Surveyed	Latitude[1] (DD)	Longitude[1] (DD)
					Interdunal Wetland			
19	WET19	PEM1C	0.046	1	Coastal Plain Interdunal Wetland	6/11/2021	27.812764	-97.068848
20	WET20	PEM1C	0.103	1	Coastal Plain Interdunal Wetland	6/11/2021	27.812481	-97.068105
21	WET21	PEM1C	0.076	1	Coastal Plain Interdunal Wetland	6/11/2021	27.812147	-97.069345
22	WET22	PEM1C	0.496	2	Coastal Plain Interdunal Wetland	6/11/2021	27.811265	-97.070193
23	WET23	PEM1C	0.314	8	Coastal Plain Interdunal Wetland	6/11/2021	27.809716	-97.071628
24	WET24	PEM1C	0.003	1	Coastal Plain Interdunal Wetland	6/11/2021	27.808763	-97.072353
25	WET25	PEM1C	0.001	1	Coastal Plain Interdunal Wetland	6/11/2021	27.808478	-97.072709
26	WET26	PEM1C	0.005	1	Coastal Plain Interdunal Wetland	6/11/2021	27.808275	-97.072965
27	WET27	PEM1C	0.017	1	Coastal Plain Interdunal Wetland	6/11/2021	27.806745	-97.074284
28	WET28	PEM1C	0.019	1	Coastal Plain Interdunal Wetland	6/11/2021	27.806143	-97.074841
29	WET29	PEM1C	0.021	1	Coastal Plain Interdunal Wetland	6/11/2021	27.805725	-97.075037
30	WET30	PEM1C	0.005	1	Coastal Plain Interdunal Wetland	6/11/2021	27.805787	-97.075194
31	WET31	PEM1C	0.123	2	Coastal Plain Interdunal Wetland	6/11/2021	27.805031	-97.075843
TOTALS			**22.911**	**45**				

Notes: [1] Latitude/longitude recorded for the polygon centroid of the delineated wetland.

Below is a summary of wetlands delineated within the MI PSA:

- No estuarine or marine wetlands were observed below the MHW elevation; therefore, no wetlands are subject to both Section 10 and Section 404 regulations.
- No estuarine or marine wetlands subject to Section 404 jurisdiction (i.e., tidally influenced wetlands occurring between MHW and HTL elevations) were observed.
- Non-tidal, palustrine wetlands subject to Section 404 account for 22.911 acres of palustrine emergent coastal plain interdunal wetlands (PEM1C).

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5 Discussion and Conclusions

5.1 Discussion of Results and General Conclusions

Field delineation surveys were conducted from April 27 through May 27, 2021 to identify potential WOUS as defined by the USACE (33 CFR 328.3(a)), wetlands (33 CFR 328.3(c)), SAV, and oyster habitat present within five separate PSAs located near the Corpus Christi Ship Channel in Aransas and Nueces counties, Texas. Results of the field delineation surveys document seven waterbody types (M1UBL, M2USN, E1UBL, E1ABL, E1RF2L, E2USN, and PUBH), six types of estuarine wetland habitats (E2ABM, E2ABN, E2EM1N, E2EM1N1, E2EM1P, and E2SS3N), four types of palustrine wetland habitats (PEM1C, PEM1C1, PSS1C, and PSS3C), five species of SAV (shoalweed, turtle grass, star grass, widgeon grass, and manatee grass), and one species of oyster (eastern oyster). Locations and acreage amounts of identified waters and wetlands by site are included in Tables 4.5-1 through 4.5-5 (waters) and Tables 4.6-1 through 4.6-5 (wetlands) within Section 4 “Waterbodies, Wetlands, SAV, and Oyster Delineation Results. Table 5.1-1 provides a summary of waters and wetlands delineated within the five PSA’s combined.

Table 5.1-1: Summary of Waters and Wetlands Delineated Within all Five PSAs Combined

Cowardin	No. of Mapped Polygons	Acres within PSA	TPWD EMST Classification
Section 10/404 Waterbodies			
E1ABL		148.295	Estuarine Open Water-Seagrass Bed
E1RF2L		3.412	Estuarine Open Water-Oysters
E1UBL		547.100	Estuarine Open Water
M1UBL		480.977	Marine Open Water
Section 10/404 Waterbodies Subtotal		**1179.784**	
Section 404 Tidal Waterbodies			
E2USN		104.605	Texas Coastal Beach-Estuarine
M2USN		44.663	Texas Coastal Beach-Marine
Section 404 Tidal Waterbodies Subtotal		149.268	
Section 404 Non-tidal Waterbodies			
PUBH		0.753	Palustrine -Open Water Pond
Waterbodies Total		**1,329.805**	
Section 10/404 Wetlands			
E2EM1N		4.638	Coastal: Salt and Brackish Low Tidal Marsh
E2EM1N1		0.024	Texas Salt and Brackish Tidal Flats
E2SS3N		13.731	Coastal: Mangrove Shrubland
Section 10/404 Wetlands Subtotal		18.393	
Section 404 Tidal Wetlands			
E2ABM		4.301	South Texas: Algal Flat (Inland open water depressions)
E2ABN		89.668	South Texas: Algal Flat
E2EM1N		2.080	Coastal: Salt and Brackish Low Tidal Marsh
E2EM1N1		32.240	Texas Salt and Brackish Tidal Flats
E2EM1P		25.639	Coastal: Salt and Brackish High Tidal Marsh

Cowardin	No. of Mapped Polygons	Acres within PSA	TPWD EMST Classification
E2SS3N		30.274	Coastal: Mangrove Shrubland
Section 404 Tidal Wetlands Subtotal		**184.202**	
Section 404 Non-tidal Wetlands			
PSS3C		0.874	Coastal: Mangrove Shrubland
PEM1C		163.263	Coastal Plain Interdunal Wetland; Coastal: Sea Ox-Eye Daisy Flats; Texas Saline Coastal Prairie
PEM1C1		7.668	Texas Salty Prairie
PSS1C		3.281	Non-Native Invasive Brazilian Pepper Tree Shrubland
Section 404 Non-tidal Wetlands Subtotal		**175.086**	
Wetlands Total		**377.681**	
Uplands Total		**460.995**	
TOTALS		**2,168.481**	

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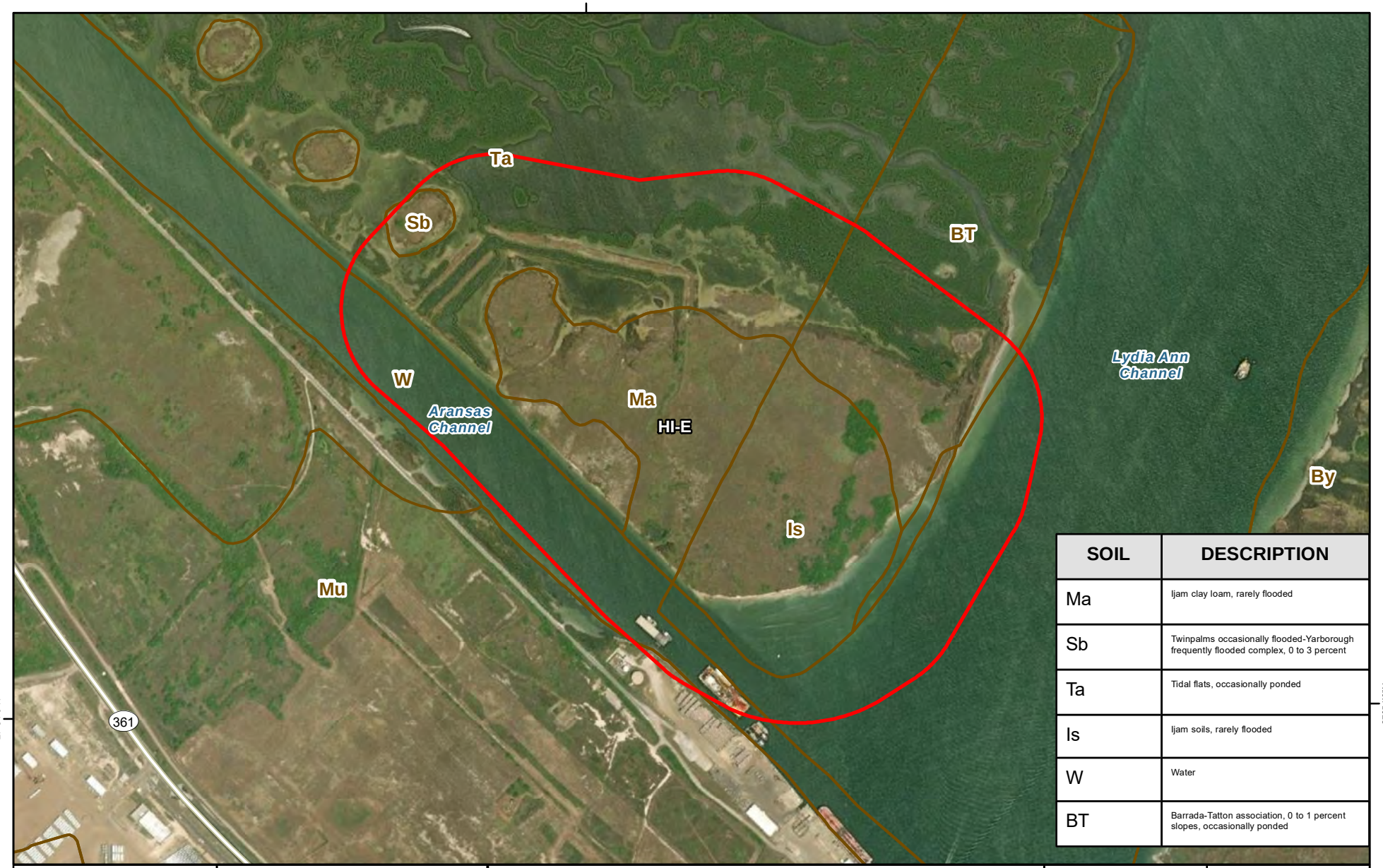
7 Appendices

A. Map Figures (2-9)



SOIL	DESCRIPTION
Ma	Ijam clay loam, rarely flooded
Sb	Twinpalms occasionally flooded-Yarborough frequently flooded complex, 0 to 3 percent
Ta	Tidal flats, occasionally ponded
Is	Ijam soils, rarely flooded
W	Water
BT	Barrada-Tatton association, 0 to 1 percent slopes, occasionally ponded

Notes:

Data Sources:
NRCS SSURGO Soils

Legend
- Project Study Area (269.4 Acres)
- NRCS Soil Unit

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
HI-E - FIGURE 2

Site HI-E NRCS Soils Map
Aransas & Nueces County, TX

900 0 900 1,800 Feet

N W E S

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

ABSOLUTE SCALE: 1:10,800

REFERENCE SCALE: 1 IN = 900 FT

Drawn By: CLB
Date: 07/06/2021

SOIL	DESCRIPTION
W	Water
Sb	Twinpalms occasionally flooded-Yarborough frequently flooded complex, 0 to 3 percent
Ta	Tidal flats, occasionally ponded

Notes:

Data Sources:
NRCS SSURGO Soils

Legend
- Project Study Area (250.6 Acres)
- NRCS Soil Unit

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
SS2 - FIGURE 2

Site SS2 NRCS Soils Map
Nueces County, TX

700 0 700 1,400 Feet

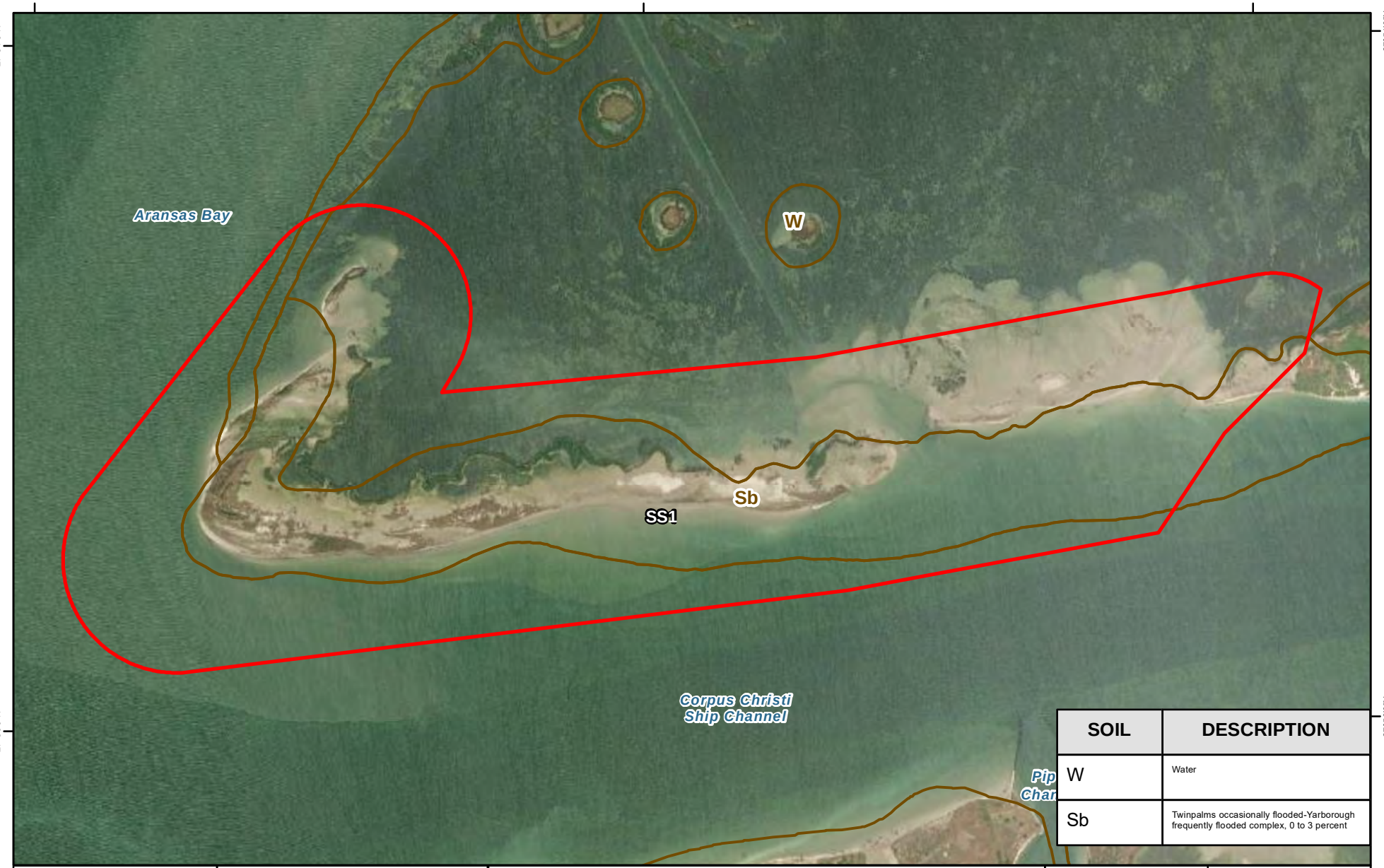
N W E S

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

ABSOLUTE SCALE: 1:8,400

REFERENCE SCALE: 1 IN = 700 FT

Drawn By: CLB
Date: 07/06/2021



SOIL	DESCRIPTION
W	Water
Sb	Twinpalms occasionally flooded-Yarborough frequently flooded complex, 0 to 3 percent

Notes:

Data Sources:
NRCS SSURGO Soils

Legend
- Project Study Area (590 Acres)
- NRCS Soil Unit

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
SS1 - FIGURE 2

Site SS1 NRCS Soils Map
Nueces County, TX

1,200 0 1,200 2,400 Feet

N W E S

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

ABSOLUTE SCALE: 1:14,400

REFERENCE SCALE: 1 IN = 1,200 FT

Drawn By: CLB
Date: 07/06/2021

See Page 3

SOIL	DESCRIPTION
W	Water
Sb	Twinpalms occasionally flooded-Yarborough frequently flooded complex, 0 to 3 percent
Ta	Tidal flats, occasionally ponded

Notes:

Data Sources:
NRCS SSURGO Soils

Legend
- Project Study Area (294.1 Acres)
- NRCS Soil Unit

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
PA4 - FIGURE 2

Site PA4 NRCS Soils Map
Nueces County, TX

800 0 800 1,600 Feet

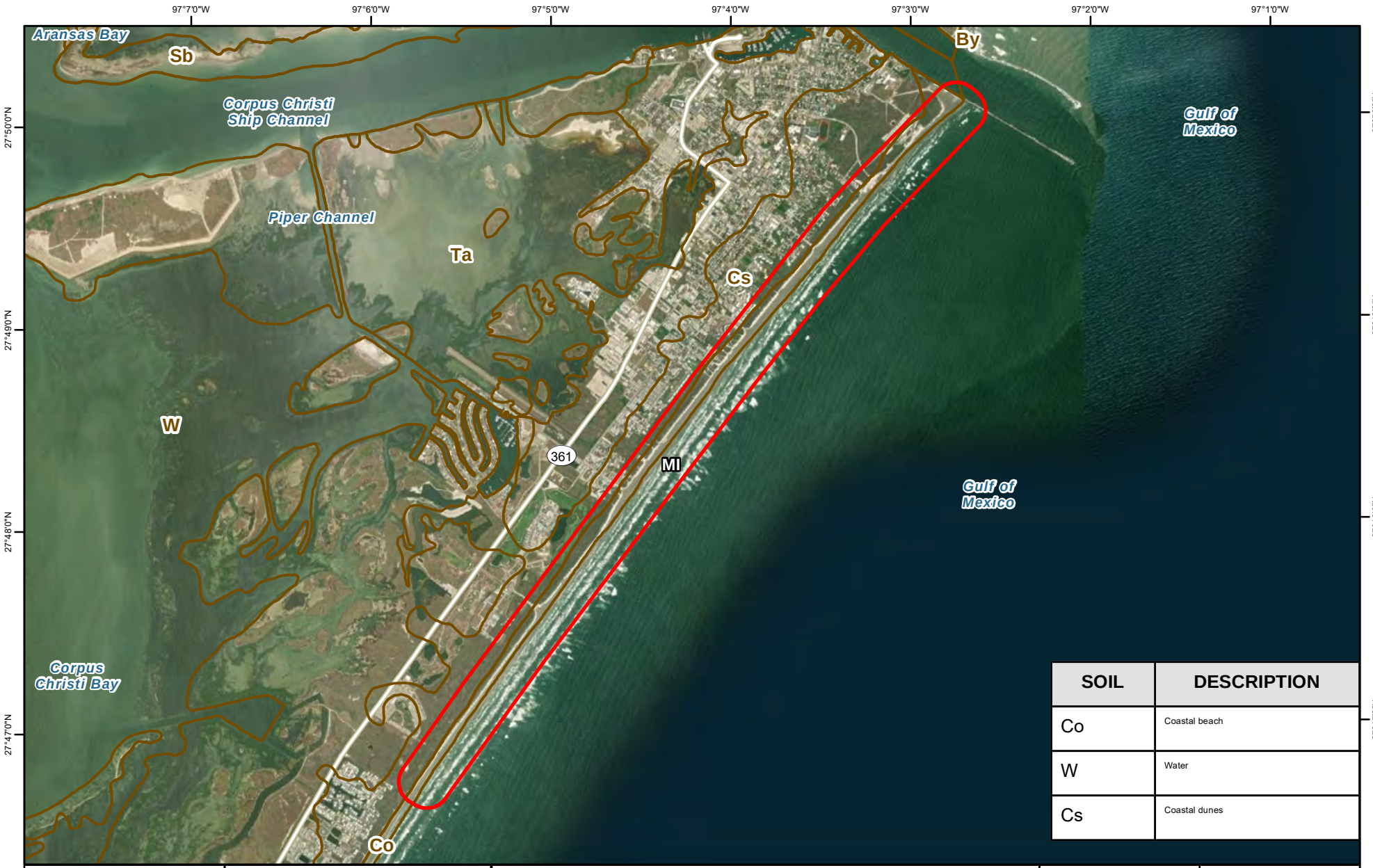
N W E S

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

ABSOLUTE SCALE: 1:9,600

REFERENCE SCALE: 1 IN = 800 FT

Drawn By: CLB
Date: 07/06/2021



SOIL	DESCRIPTION
Co	Coastal beach
W	Water
Cs	Coastal dunes

Notes:

Data Sources:
NRCS SSURGO Soils

Legend
Project Study Area (986 Acres)
NRCS Soil Unit

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
MI - FIGURE 2

Site MI NRCS Soils Map
Nueces County, TX

4,000 0 4,000 8,000 Feet

N W E S

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

ABSOLUTE SCALE: 1:48,000

REFERENCE SCALE: 1 IN = 4,000 FT

Drawn By: CLB
Date: 07/06/2021

Notes:

Data Sources:
NWI Inventory USFWS

Legend

Project Study Area (269.4 Acres)

NWI Wetland

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
HI-E - FIGURE 3

Site HI-E USFWS NWI Wetland Map
Aransas & Nueces County, TX

900 0 900 1,800 Feet

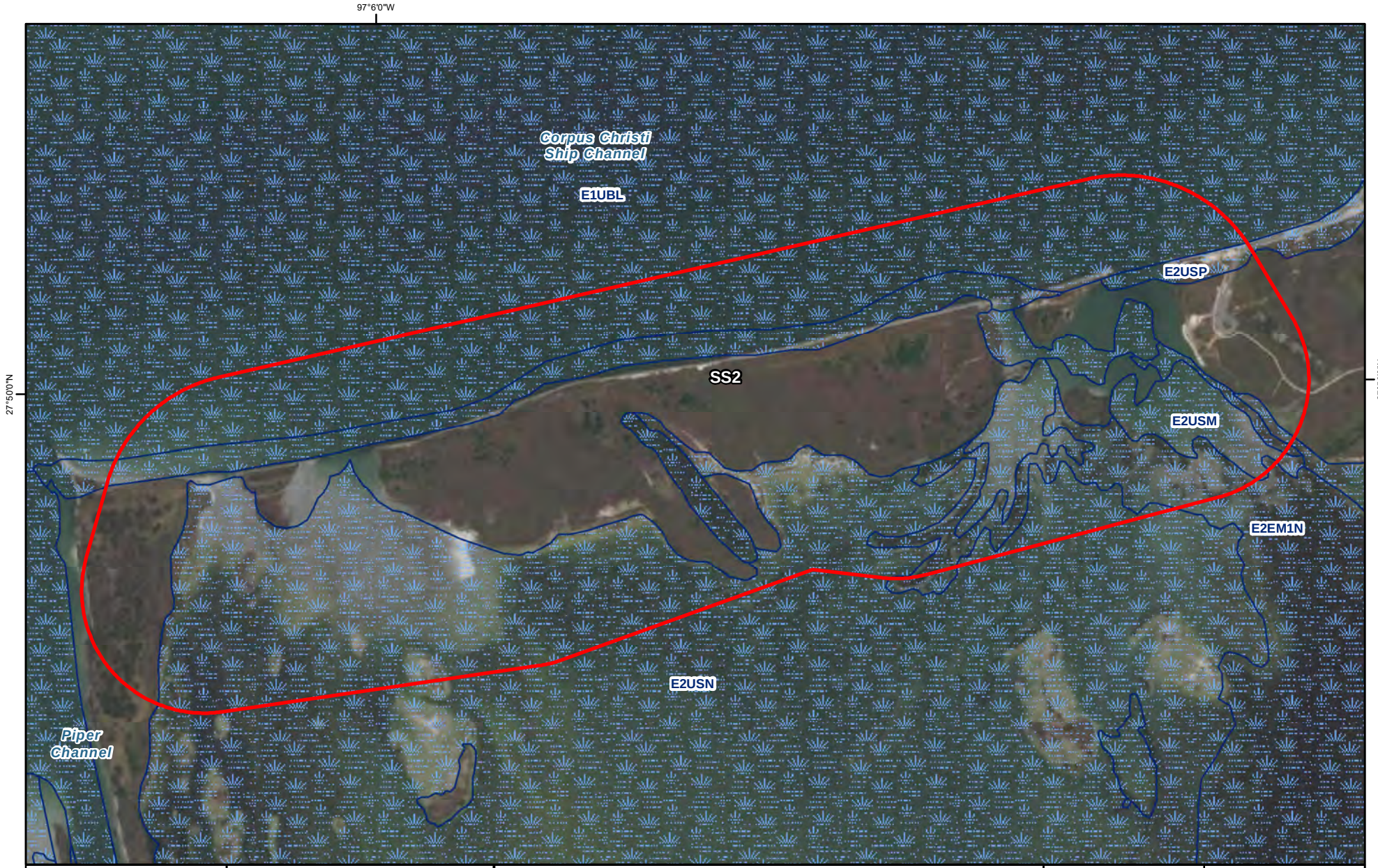
N W E S

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

ABSOLUTE SCALE: 1:10,800

REFERENCE SCALE: 1 IN = 900 FT

Drawn By: CLB
Date: 06/16/2021



Notes:

Data Sources:
NWI Inventory USFWS

Legend

Project Study Area (250.6 Acres)

NWI Wetland

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
SS2 - FIGURE 3

Site SS2 USFWS NWI Wetland Map
Nueces County, TX

700 0 700 1,400 Feet

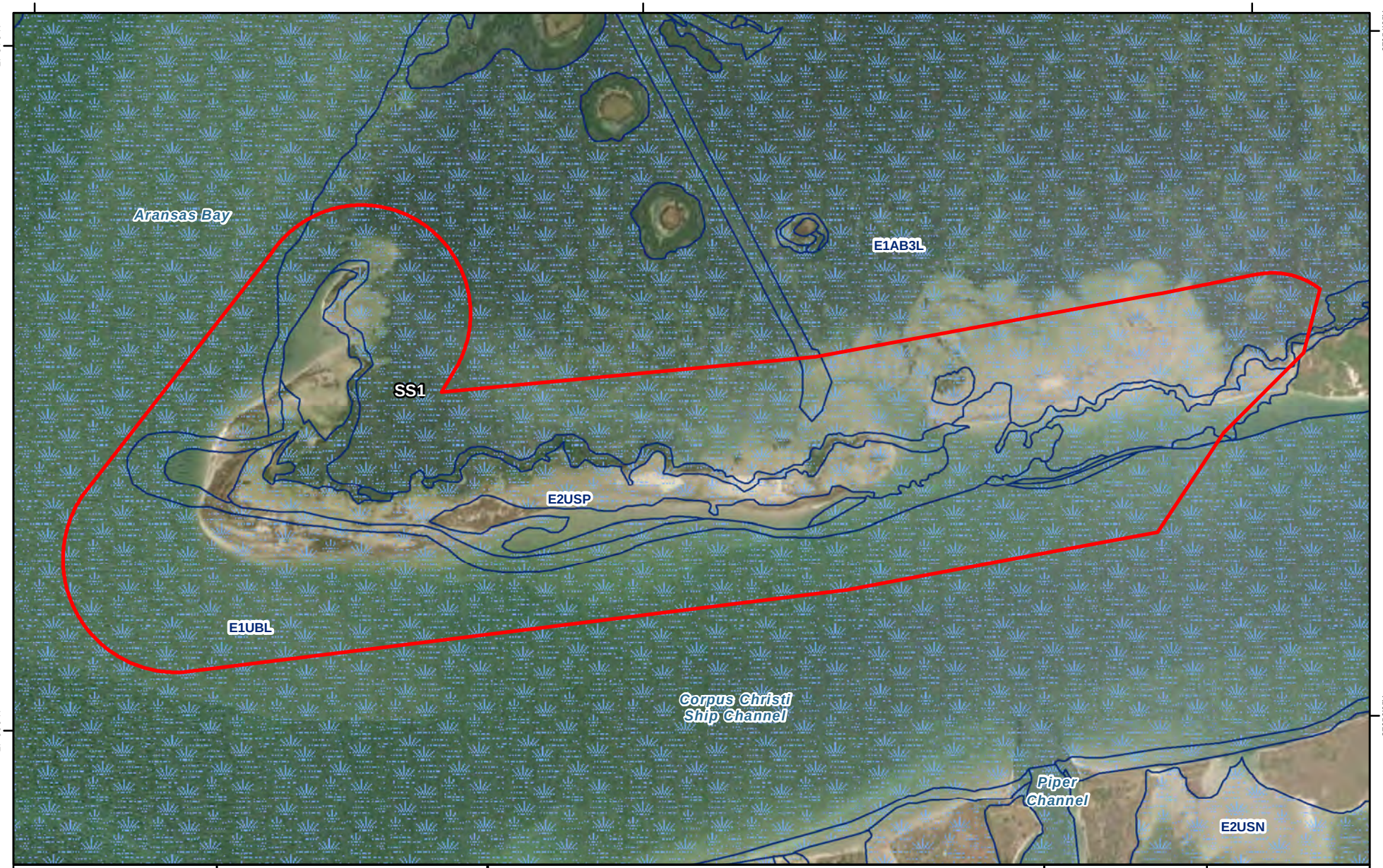
N W E S

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

ABSOLUTE SCALE:
1:8,400

REFERENCE SCALE:
1 IN = 700 FT

Drawn By: CLB
Date: 06/16/2021



See Page 4

Notes:

Data Sources:
NWI Inventory USFWS

Legend
Project Study Area (590 Acres)
NWI Wetland

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
SS1 - FIGURE 3

Site SS1 USFWS NWI Wetland Map
Nueces County, TX

1,200 0 1,200 2,400 Feet

N W E S

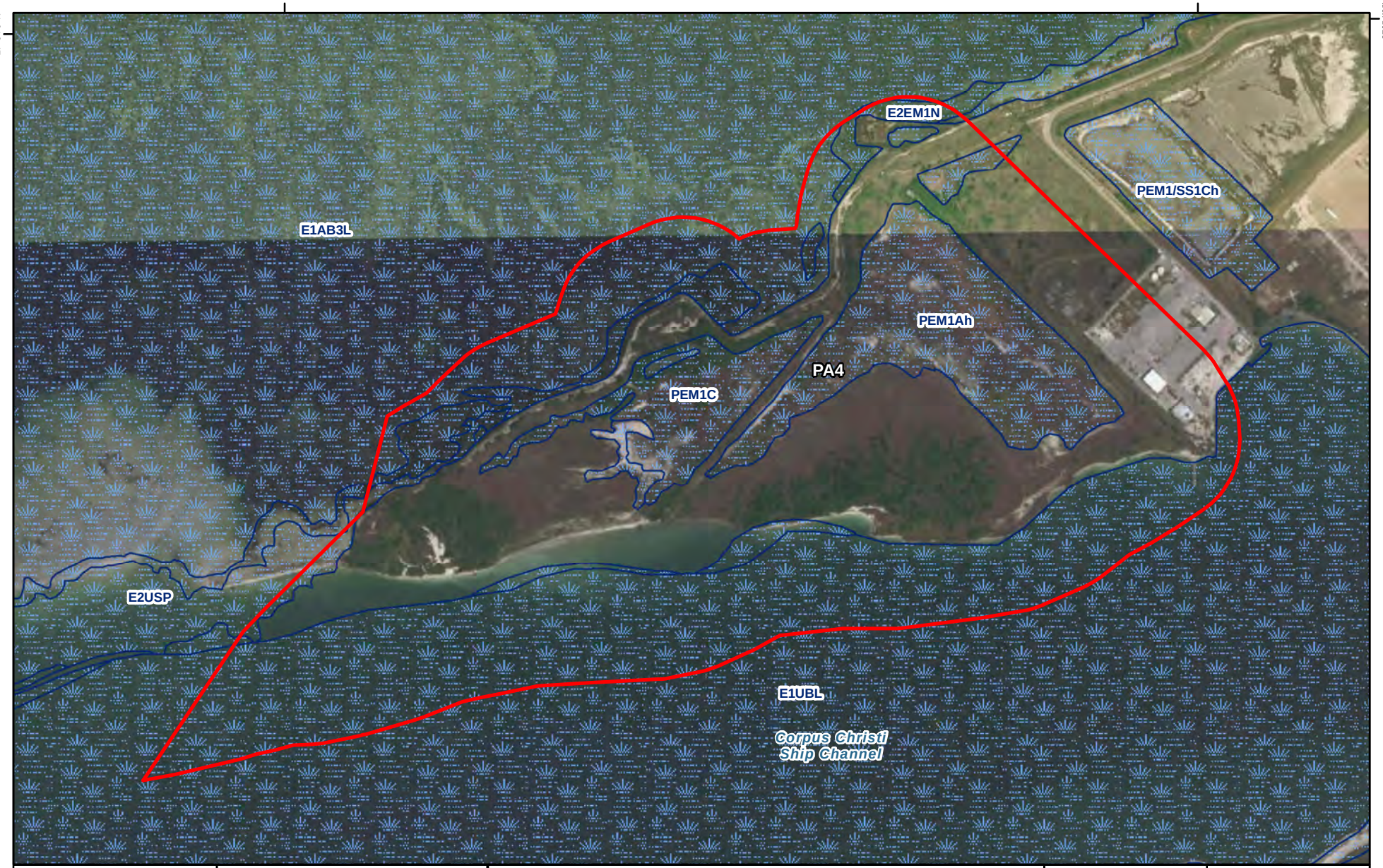
MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

ABSOLUTE SCALE:
1:14,400

REFERENCE SCALE:
1 IN = 1,200 FT

Drawn By: CLB
Date: 06/16/2021

See Page 3



Notes:

Data Sources:
NWI Inventory USFWS

Legend

Project Study Area (294.1 Acres)

NWI Wetland

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
PA4 - FIGURE 3

Site PA4 USFWS NWI Wetland Map
Nueces County, TX

800 0 800 1,600 Feet

N W E S

ABSOLUTE SCALE:
1:9,600

REFERENCE SCALE:
1 IN = 800 FT

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

Drawn By: CLB
Date: 06/16/2021

Notes:

Data Sources:
NWI Inventory USFWS

Legend

Project Study Area (986 Acres)

NWI Wetland

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
MI - FIGURE 3

Site MI USFWS NWI Wetland Map
Nueces County, TX

4,000 0 4,000 8,000 Feet

N W E S

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

ABSOLUTE SCALE:
1:48,000

REFERENCE SCALE:
1 IN = 4,000 FT

Drawn By: CLB
Date: 06/16/2021

Notes:
Data Sources:
USGS NHD Streams
USGS NHD Waterbodies

Legend
Project Study Area (269.4 Acres)
NHD Stream
NHD Waterbody

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
HI-E - FIGURE 4

Site HI-E USGS NHD Streams & Waterbodies Map
Aransas & Nueces County, TX

900 0 900 1,800 Feet

N W E S

ABSOLUTE SCALE: 1:10,800

REFERENCE SCALE: 1 IN = 900 FT

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

Drawn By: CLB
Date: 07/06/2021

Notes:
Data Sources:
USGS NHD Streams
USGS NHD Waterbodies

Legend
Project Study Area (250.6 Acres)
NHD Stream
NHD Waterbody

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
SS2 - FIGURE 4

Site SS2 USGS NHD Streams & Waterbodies Map
Nueces County, TX

700 0 700 1,400 Feet

N W E S

ABSOLUTE SCALE: 1:8,400

REFERENCE SCALE: 1 IN = 700 FT

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

Drawn By: CLB
Date: 07/06/2021

See Page 4

Notes:
Data Sources:
USGS NHD Streams
USGS NHD Waterbodies

Legend
Project Study Area (590 Acres)
NHD Stream
NHD Waterbody

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
SS1 - FIGURE 4

Site SS1 USGS NHD Streams & Waterbodies Map
Nueces County, TX

1,200 0 1,200 2,400 Feet

N W E S

ABSOLUTE SCALE: 1:14,400

REFERENCE SCALE: 1 IN = 1,200 FT

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

Drawn By: CLB
Date: 07/06/2021

See Page 3

Notes:
Data Sources:
USGS NHD Streams
USGS NHD Waterbodies

Legend
Project Study Area (294.1 Acres)
NHD Stream
NHD Waterbody

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
PA4 - FIGURE 4

Site PA4 USGS NHD Streams & Waterbodies Map
Nueces County, TX

800 0 800 1,600 Feet

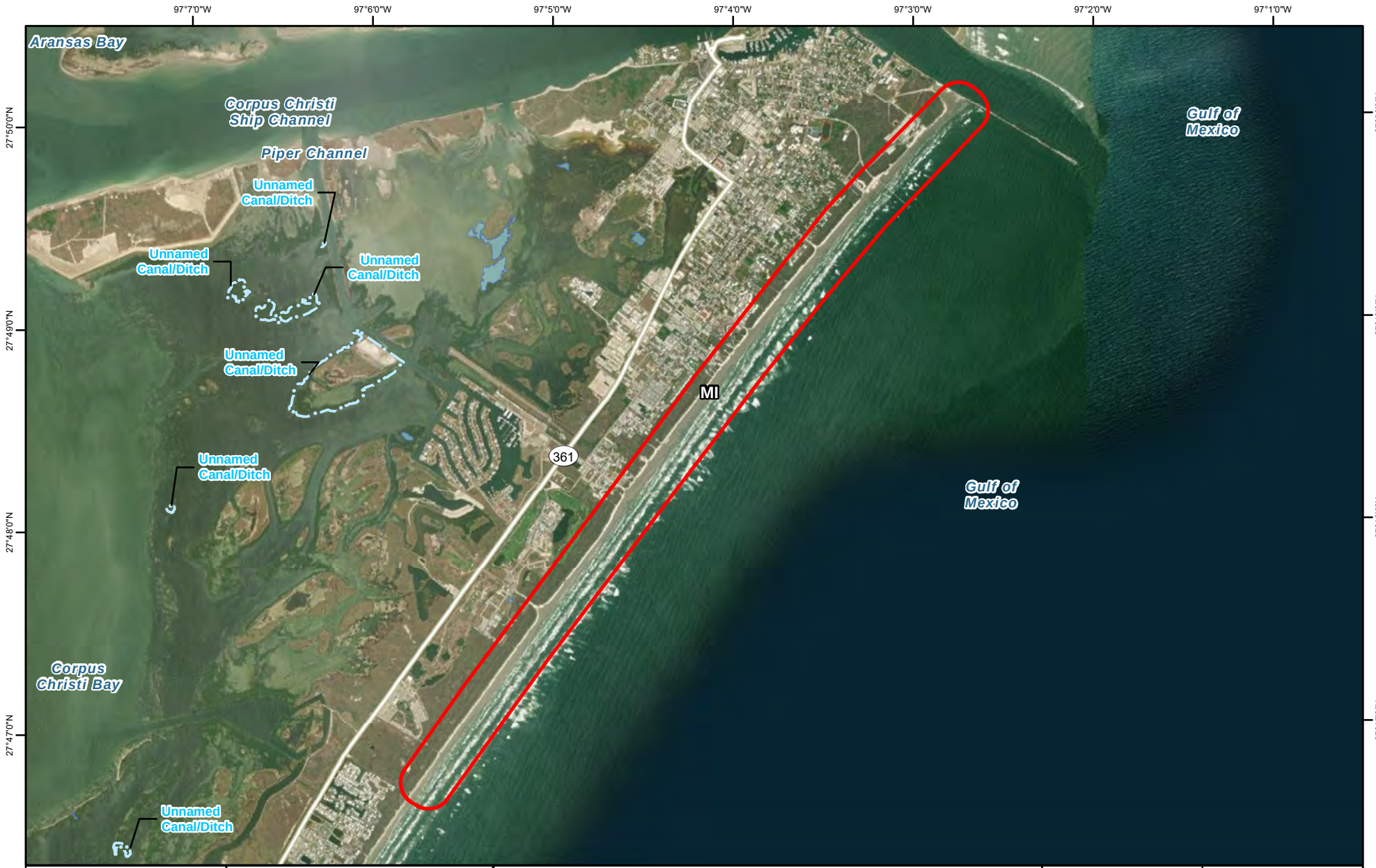
N W E S

ABSOLUTE SCALE: 1:9,600

REFERENCE SCALE: 1 IN = 800 FT

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

Drawn By: CLB
Date: 07/06/2021



Notes:
Data Sources:
USGS NHD Streams
USGS NHD Waterbodies

Legend
Project Study Area (986 Acres)
NHD Stream
NHD Waterbody

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
MI - FIGURE 4

Site MI USGS NHD Streams & Waterbodies Map
Nueces County, TX

4,000 0 4,000 8,000 Feet

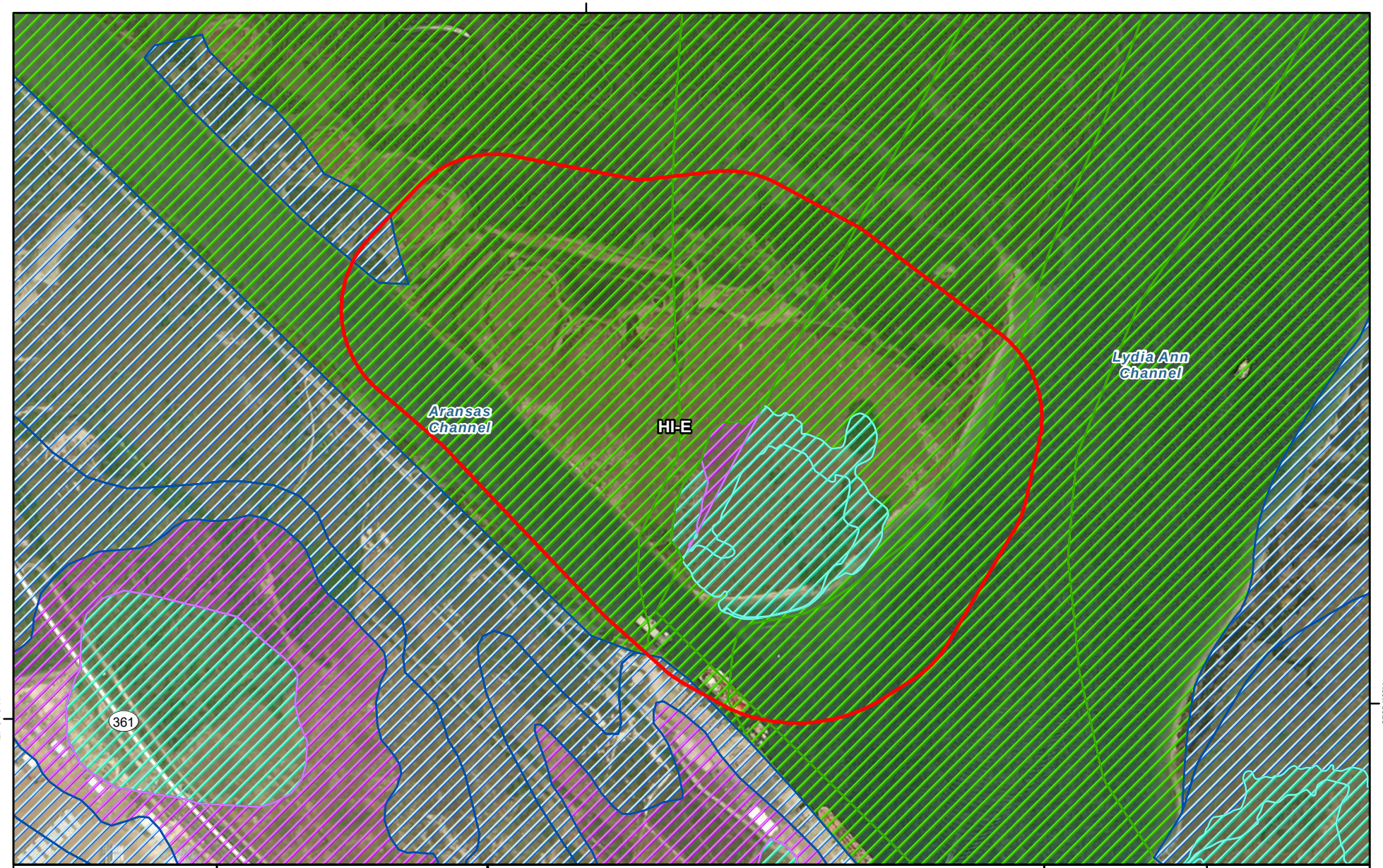
N W E S

ABSOLUTE SCALE: 1:48,000

REFERENCE SCALE: 1 IN = 4,000 FT

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

Drawn By: CLB
Date: 07/06/2021



Notes:

Data Sources:
Nueces County, TX FEMA Preliminary FIRM Database
Aransas County, TX FEMA NHFL Database

Legend
- Project Study Area (269.4 Acres)
- Open Water
- 0.2% Annual Chance
- AE
- VE
- X

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
HI-E - FIGURE 5

Site HI-E FEMA Floodplain Map
Aransas & Nueces County, TX

900 0 900 1,800 Feet

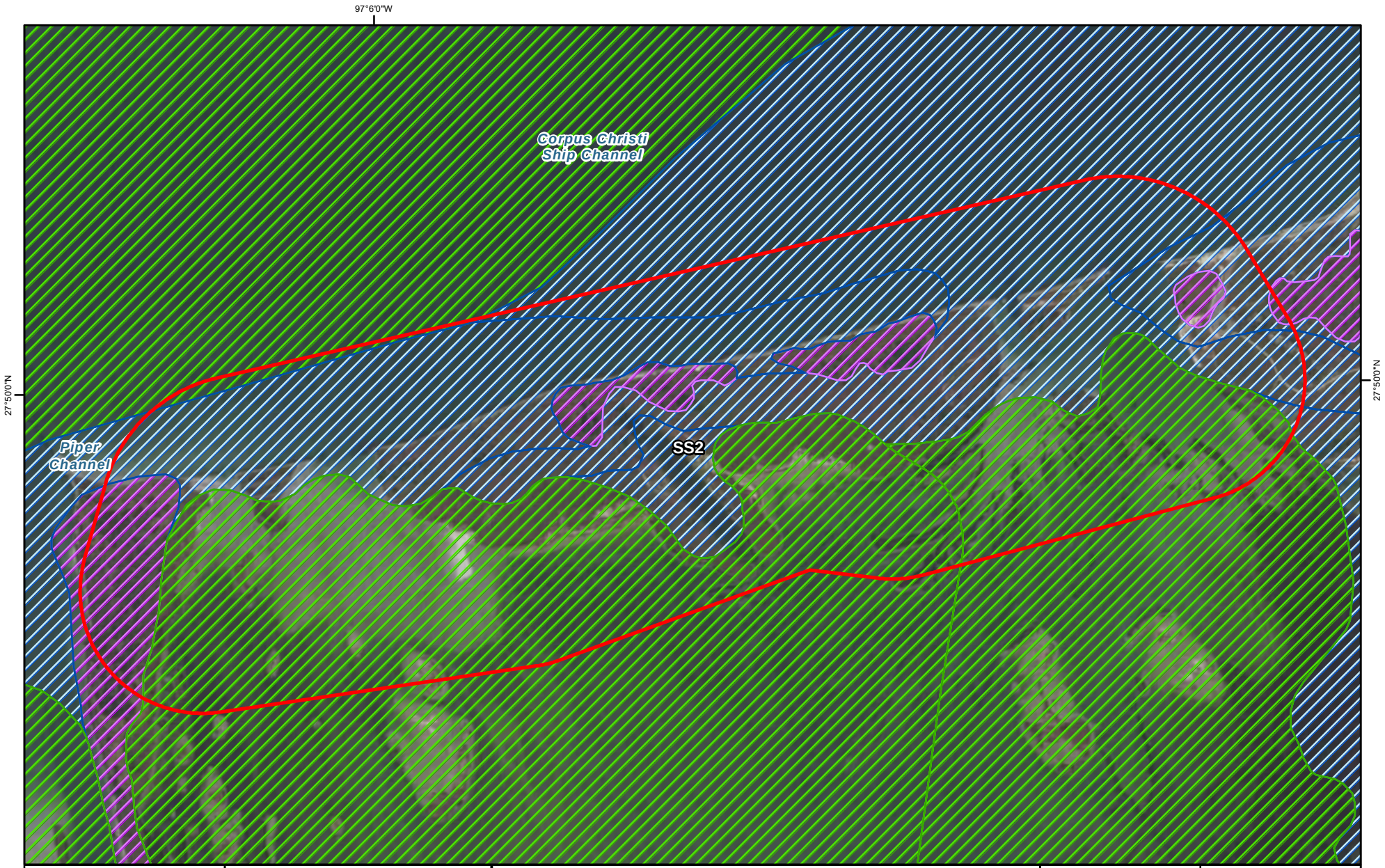
N W E S

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

ABSOLUTE SCALE: 1:10,800

REFERENCE SCALE: 1 IN = 900 FT

Drawn By: CLB
Date: 07/06/2021



Notes:

Data Sources:
Nueces County, TX FEMA Preliminary FIRM Database

Legend
- Project Study Area (250.6 Acres)
- Open Water
- 0.2% Annual Chance
- AE
- VE
- X

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
SS2 - FIGURE 5

Site SS2 FEMA Floodplain Map
Nueces County, TX

700 0 700 1,400 Feet

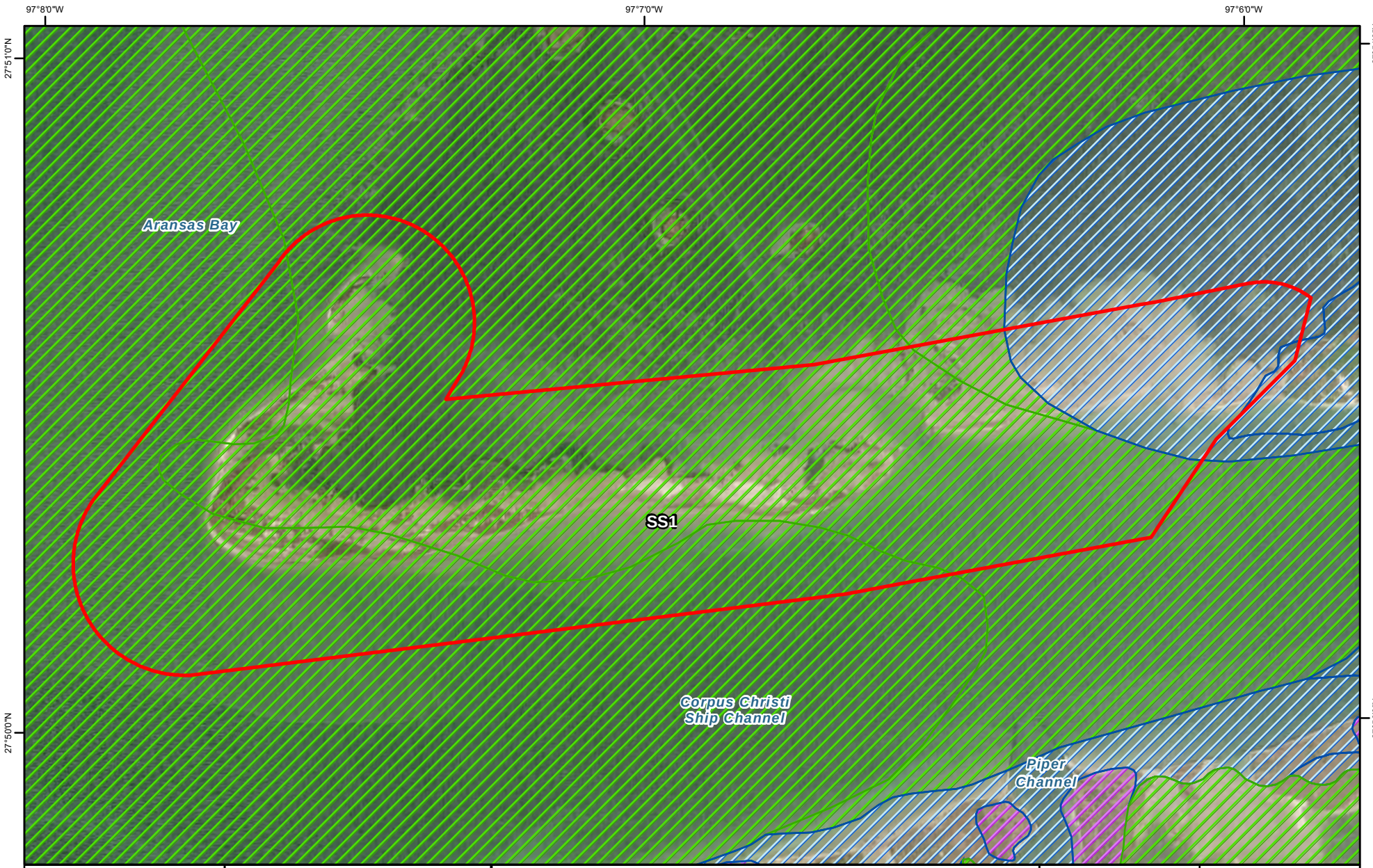
N W E S

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

ABSOLUTE SCALE: 1:8,400

REFERENCE SCALE: 1 IN = 700 FT

Drawn By: CLB
Date: 07/06/2021



See Page 4

Notes:

Data Sources:
Nueces County, TX FEMA
Preliminary FIRM Database

Legend
- Project Study Area (590 Acres)
- Open Water
- 0.2% Annual Chance
- AE
- VE
- X

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
SS1 - FIGURE 5

Site SS1 FEMA Floodplain Map
Nueces County, TX

1,200 0 1,200 2,400 Feet

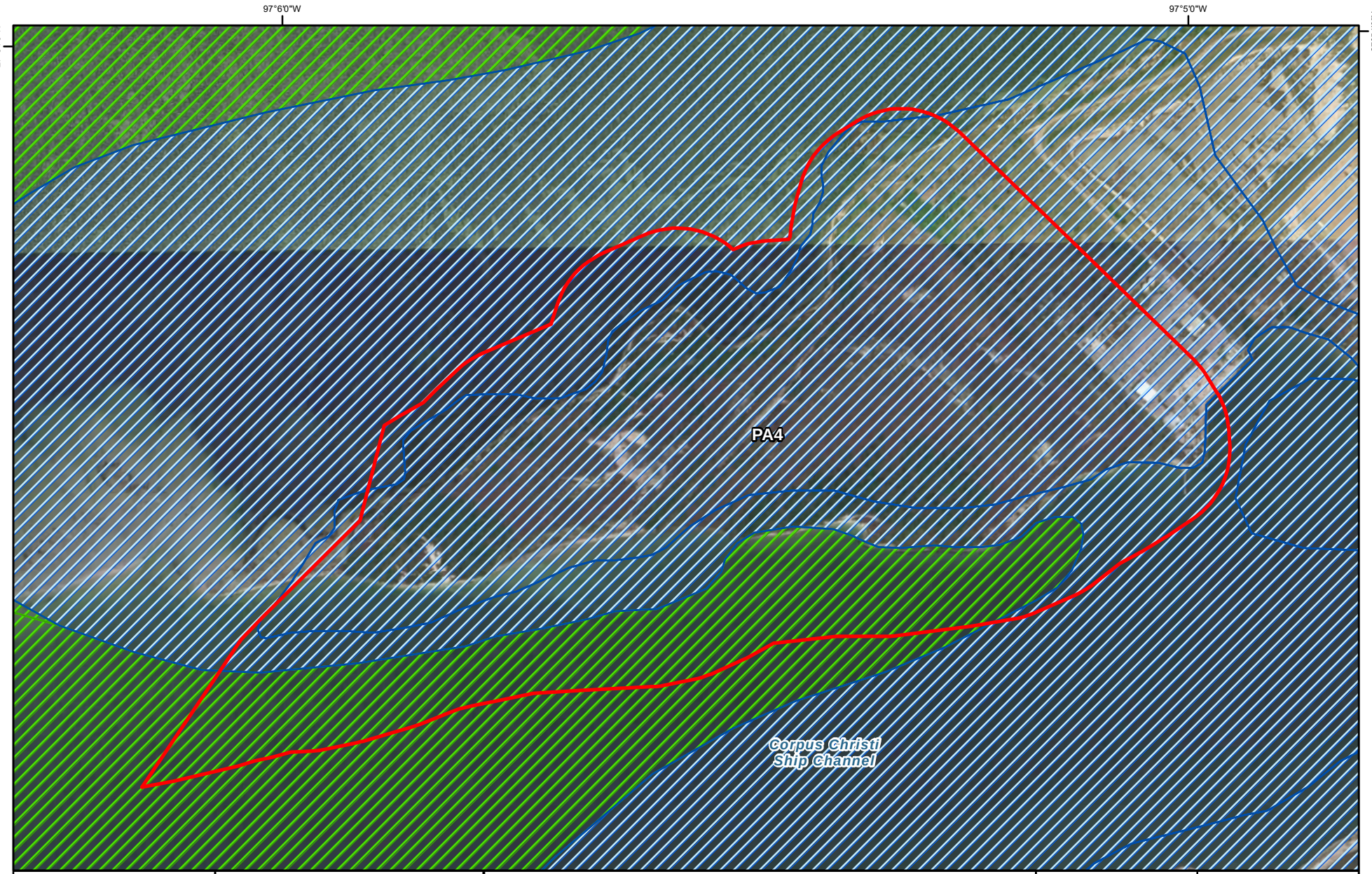
N W E S

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

ABSOLUTE SCALE: 1:14,400

REFERENCE SCALE: 1 IN = 1,200 FT

Drawn By: CLB
Date: 07/06/2021



See Page 3

Notes:

Data Sources:
Nueces County, TX FEMA
Preliminary FIRM Database

Legend

- Project Study Area (294.1 Acres)
- Open Water
- 0.2% Annual Chance
- AE
- VE
- X

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
PA4 - FIGURE 5

Site PA4 FEMA Floodplain Map
Nueces County, TX

800 0 800 1,600 Feet

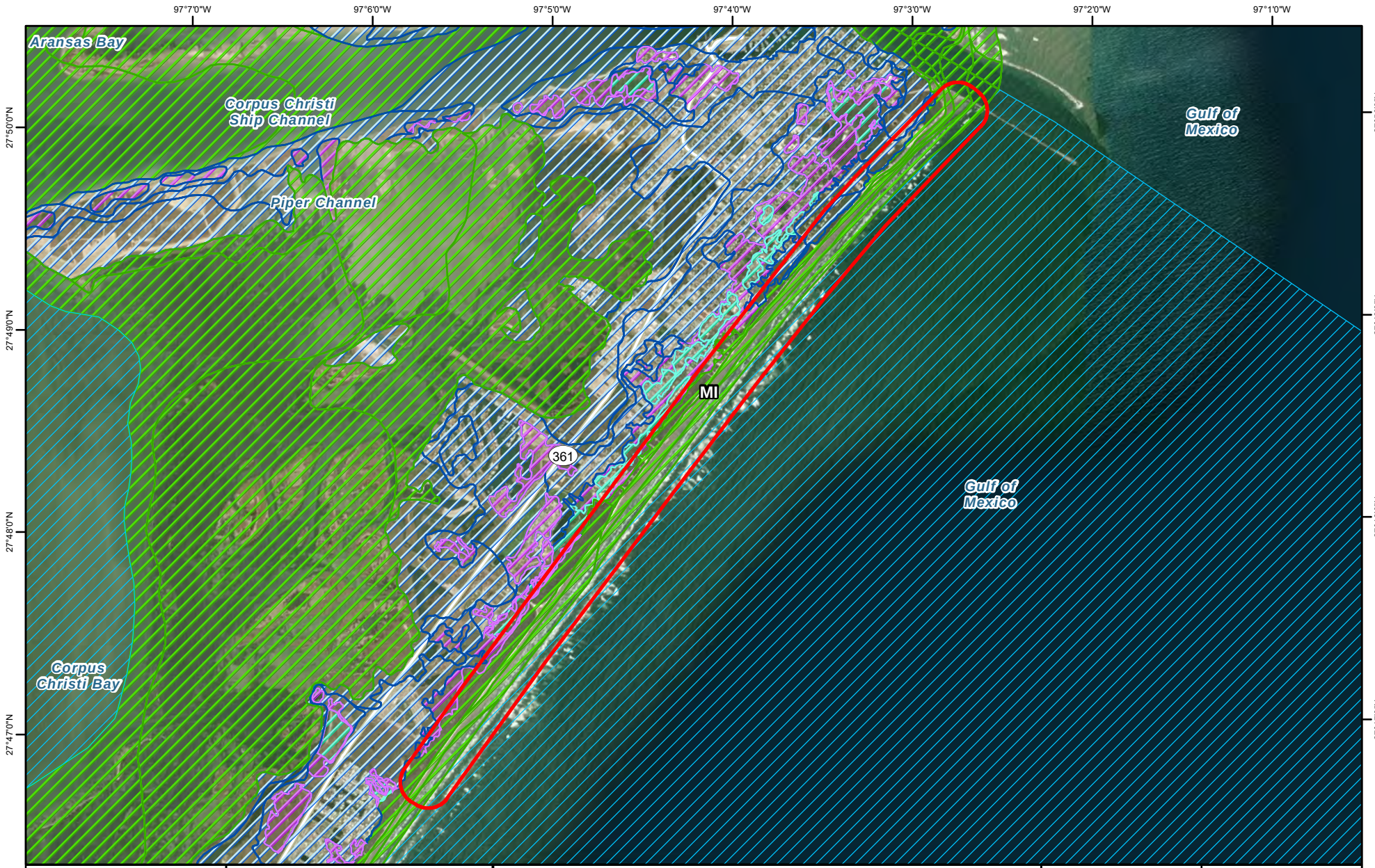
N W E S

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

ABSOLUTE SCALE: 1:9,600

REFERENCE SCALE: 1 IN = 800 FT

Drawn By: CLB
Date: 07/06/2021



Notes:

Data Sources:
Nueces County, TX FEMA Preliminary FIRM Database

Legend
- Project Study Area (986 Acres)
- Open Water
- 0.2% Annual Chance
- AE
- VE
- X

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
MI - FIGURE 5

Site MI FEMA Floodplain Map
Nueces County, TX

4,000 0 4,000 8,000 Feet

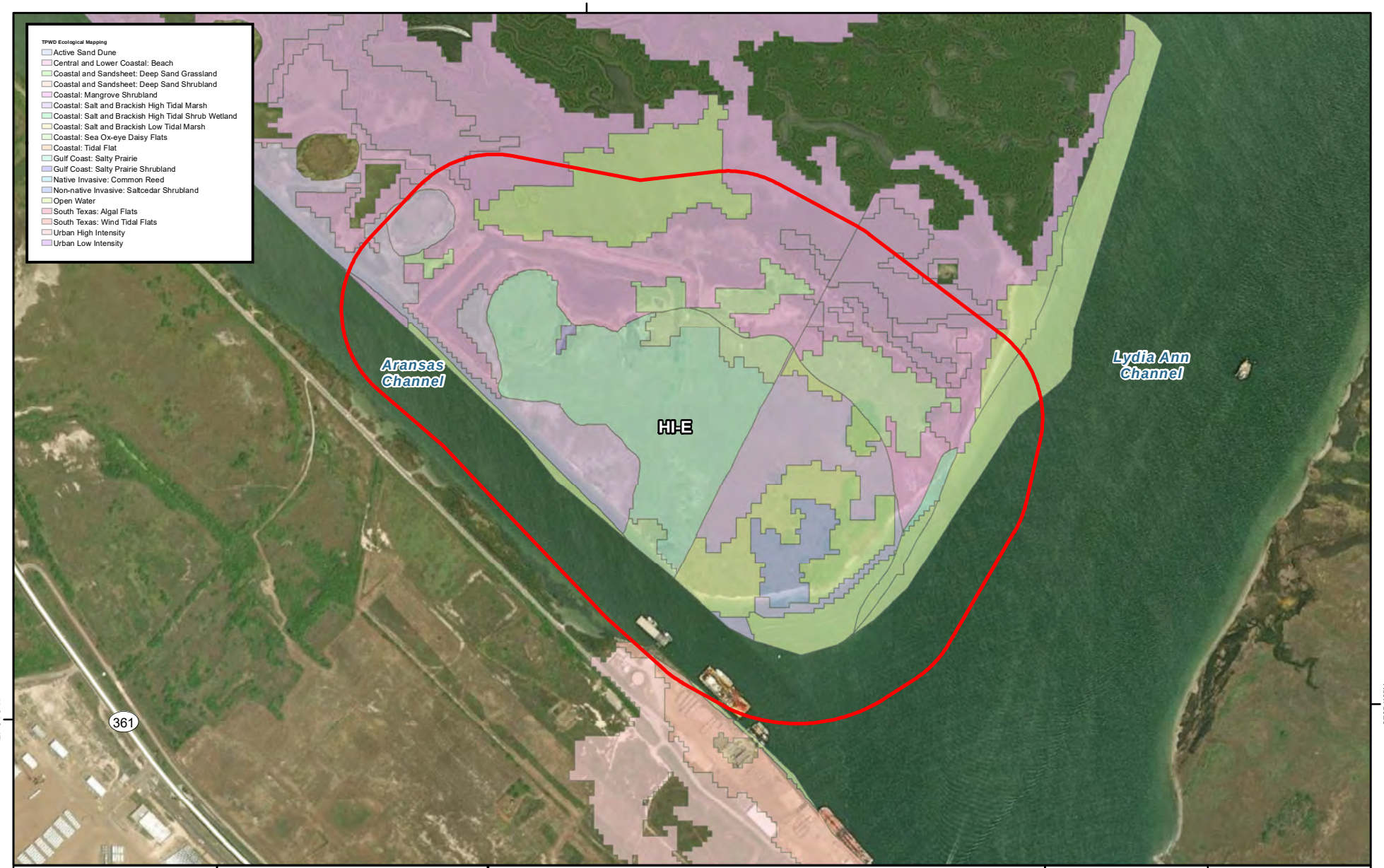
N W E S

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

ABSOLUTE SCALE: 1:48,000

REFERENCE SCALE: 1 IN = 4,000 FT

Drawn By: CLB
Date: 07/06/2021



Notes:
Data Sources:
TPWD Ecological Mapping Systems

Legend
Project Study Area (269.4 Acres)

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
HI-E - FIGURE 6

Site HI-E TPWD Ecological Mapping Systems
Aransas & Nueces County, TX

900 0 900 1,800 Feet

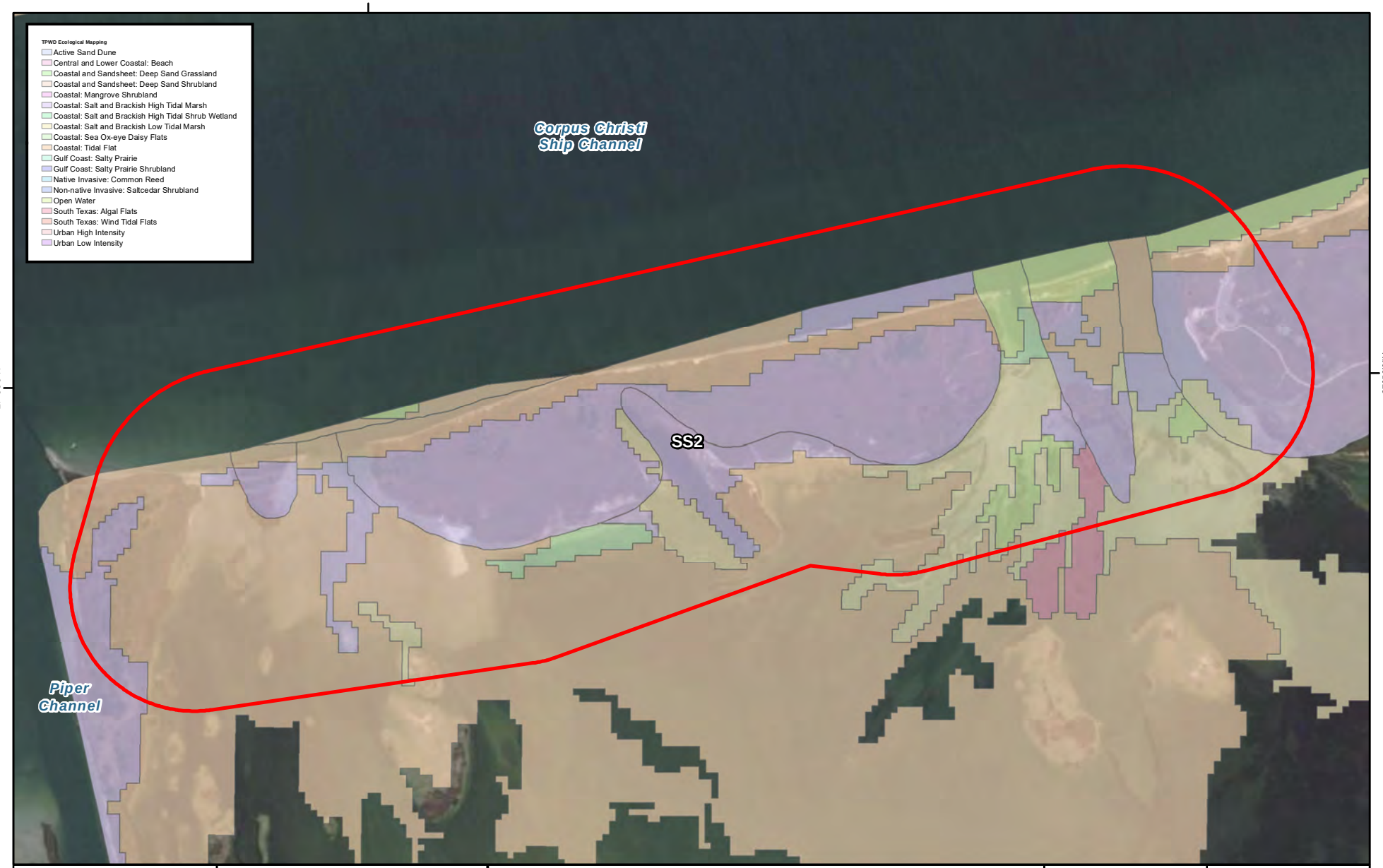
N W E S

ABSOLUTE SCALE: 1:10,800

REFERENCE SCALE: 1 IN = 900 FT

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

Drawn By: CLB
Date: 07/06/2021



Notes:
Data Sources:
TPWD Ecological Mapping Systems

Legend
Project Study Area (250.6 Acres)

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
SS2 - FIGURE 6

Site SS2 TPWD Ecological Mapping Systems
Nueces County, TX

700 0 700 1,400 Feet

N W E S

ABSOLUTE SCALE: 1:8,400

REFERENCE SCALE: 1 IN = 700 FT

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

Drawn By: CLB
Date: 07/06/2021

See Page 4

Notes:
Data Sources:
TPWD Ecological Mapping Systems

Legend
Project Study Area (590 Acres)

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
SS1 - FIGURE 6

Site SS1 TPWD Ecological Mapping Systems
Nueces County, TX

1,200 0 1,200 2,400 Feet

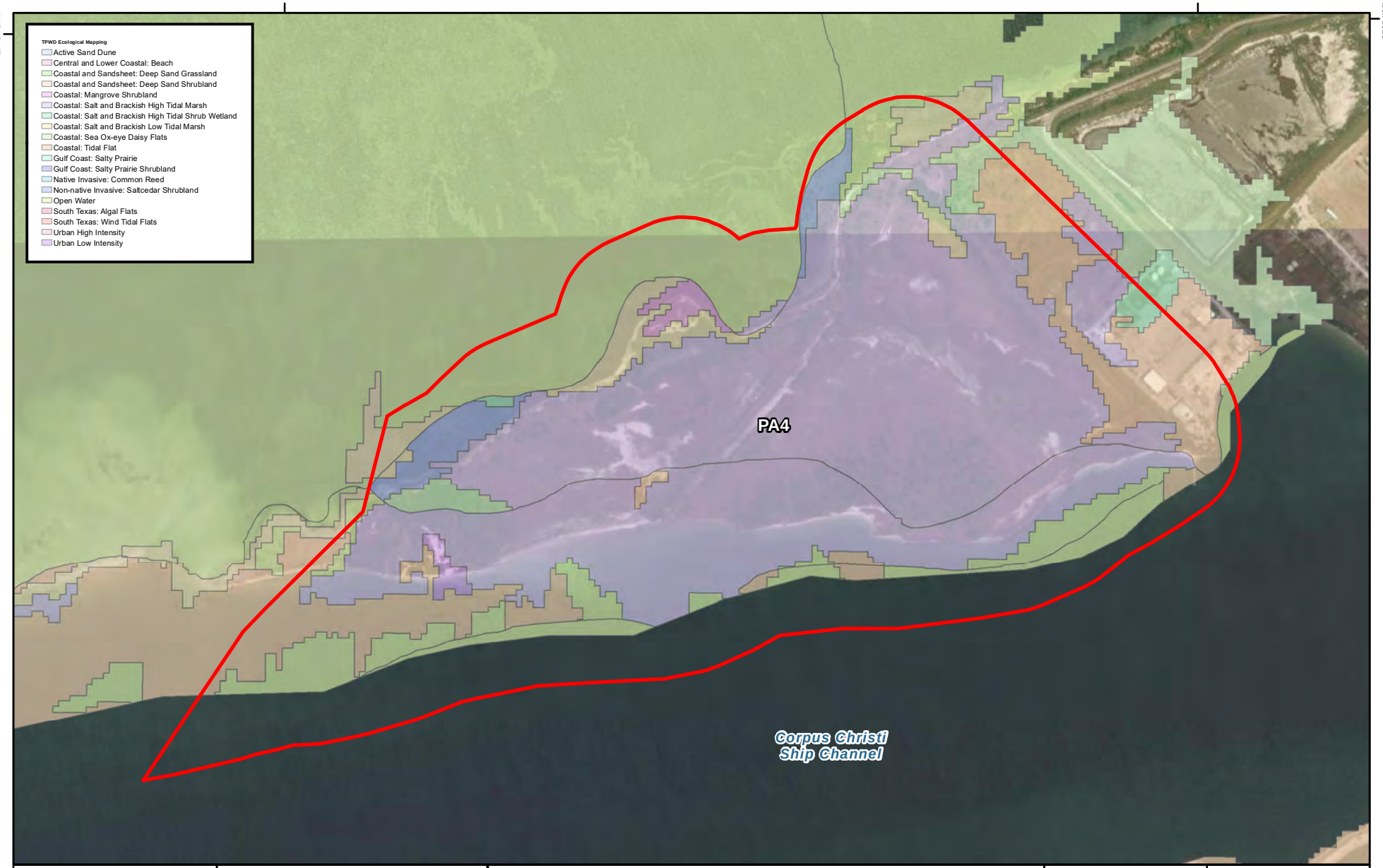
N W E S

ABSOLUTE SCALE: 1:14,400

REFERENCE SCALE: 1 IN = 1,200 FT

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

Drawn By: CLB
Date: 07/06/2021



See Page 3

Notes:
Data Sources:
TPWD Ecological Mapping Systems

Legend
Project Study Area (294.1 Acres)

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
PA4 - FIGURE 6

Site PA4 TPWD Ecological Mapping Systems
Nueces County, TX

800 0 800 1,600 Feet

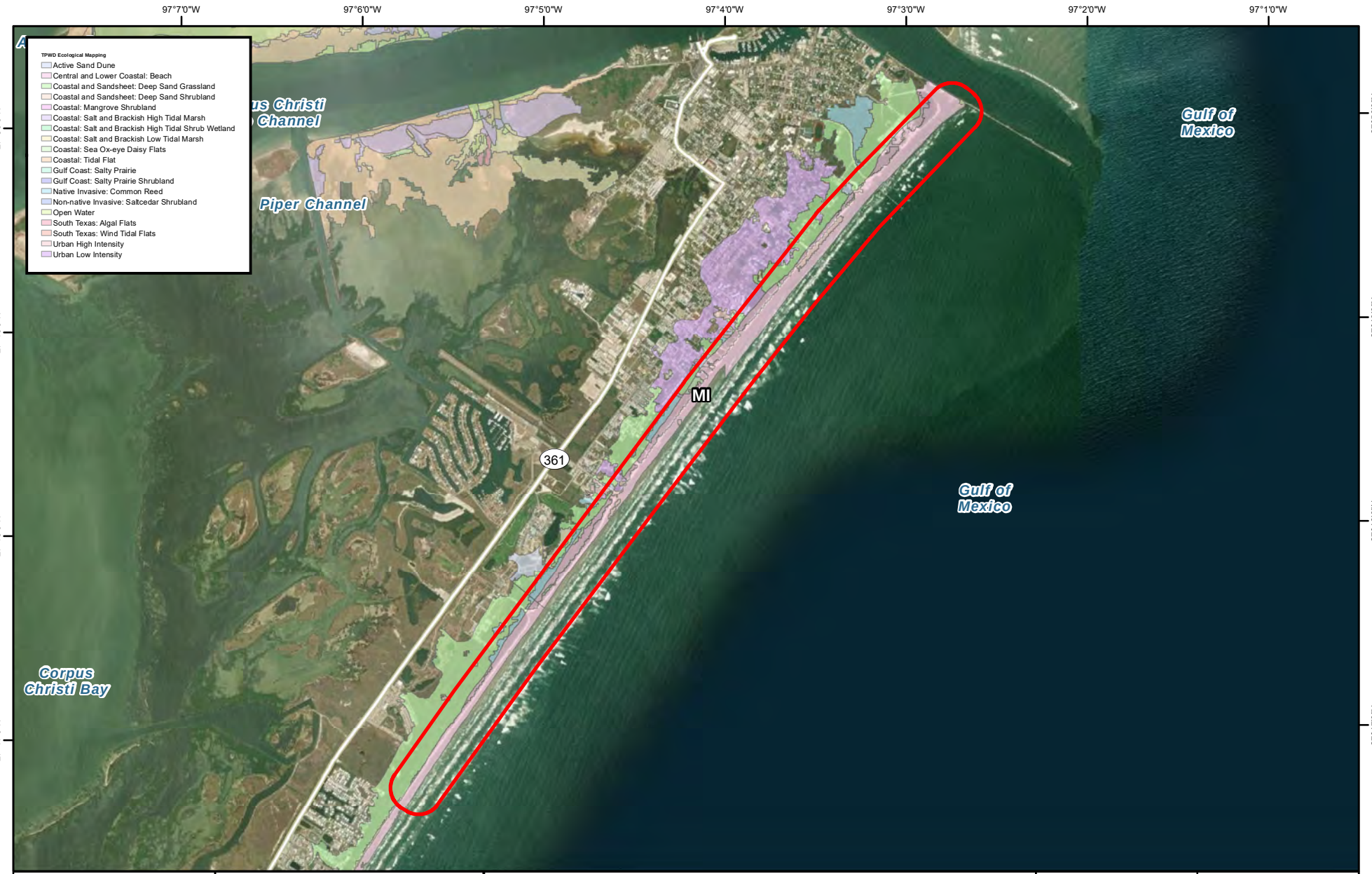
N W E S

ABSOLUTE SCALE: 1:9,600

REFERENCE SCALE: 1 IN = 800 FT

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

Drawn By: CLB
Date: 07/06/2021



Notes:
Data Sources:
TPWD Ecological Mapping Systems

Legend
Project Study Area (986 Acres)

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
MI - FIGURE 6

Site MI TPWD Ecological Mapping Systems
Nueces County, TX

4,000 0 4,000 8,000 Feet

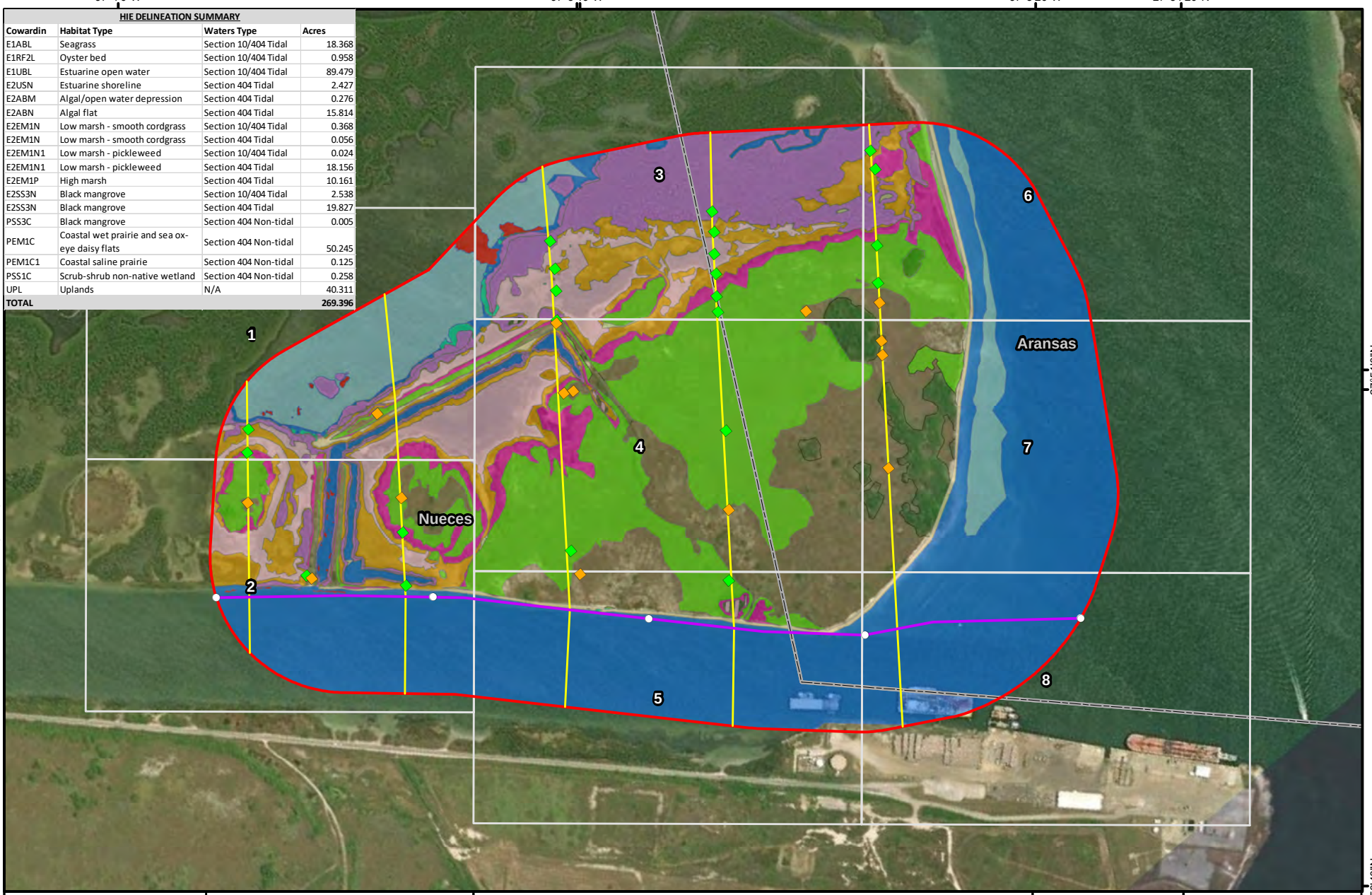
N W E S

ABSOLUTE SCALE: 1:48,000

REFERENCE SCALE: 1 IN = 4,000 FT

MOTT MACDONALD
5295 S. Commerce Dr., Ste. 600
Salt Lake City, UT, 84107

Drawn By: CLB
Date: 07/06/2021



HIE DELINEATION SUMMARY

Cowardin	Habitat Type	Waters Type	Acres
E1ABL	Seagrass	Section 10/404 Tidal	18.368
E1RF2L	Oyster bed	Section 10/404 Tidal	0.958
E1UBL	Estuarine open water	Section 10/404 Tidal	89.479
E2USN	Estuarine shoreline	Section 404 Tidal	2.427
E2ABM	Algal/open water depression	Section 404 Tidal	0.276
E2ABN	Algal flat	Section 404 Tidal	15.814
E2EM1N	Low marsh - smooth cordgrass	Section 10/404 Tidal	0.368
E2EM1N	Low marsh - smooth cordgrass	Section 404 Tidal	0.056
E2EM1N1	Low marsh - pickleweed	Section 10/404 Tidal	0.024
E2EM1N1	Low marsh - pickleweed	Section 404 Tidal	18.156
E2EM1P	High marsh	Section 404 Tidal	10.161
E2SS3N	Black mangrove	Section 10/404 Tidal	2.538
E2SS3N	Black mangrove	Section 404 Tidal	19.827
PSS3C	Black mangrove	Section 404 Non-tidal	0.005
PEM1C	Coastal wet prairie and sea ox-eye daisy flats	Section 404 Non-tidal	50.245
PEM1C1	Coastal saline prairie	Section 404 Non-tidal	0.125
PSS1C	Scrub-shrub non-native wetland	Section 404 Non-tidal	0.258
UPL	Uplands	N/A	40.311
TOTAL			**269.396**

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Notes:

Data Sources:
- PCCA Site Data
- Mott MacDonald Delineation
- TxDOT County Data
- ESRI World Imagery Layer

Upland Dataform
Wetland Dataform
Baseline Segment
Baseline
Transects
Survey Area
Page Index
County

WETLAND DELINEATION
E1ABL
E1RF2L
E1UBL
E2ABM
E2ABN
E2EM1N
E2EM1N1
E2EM1P
E2SS3N
E2USN
PEM1C
PEM1C1
PSS1C
PSS3C
UPL

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
HIE - FIGURE 7.1

Site HIE Wetland Delineation Overview Map
Aransas & Nueces County, TX

0 400 800 1,600 Feet

N E S W

ABSOLUTE SCALE: 1:8,400

REFERENCE SCALE: 1 IN = 700 feet

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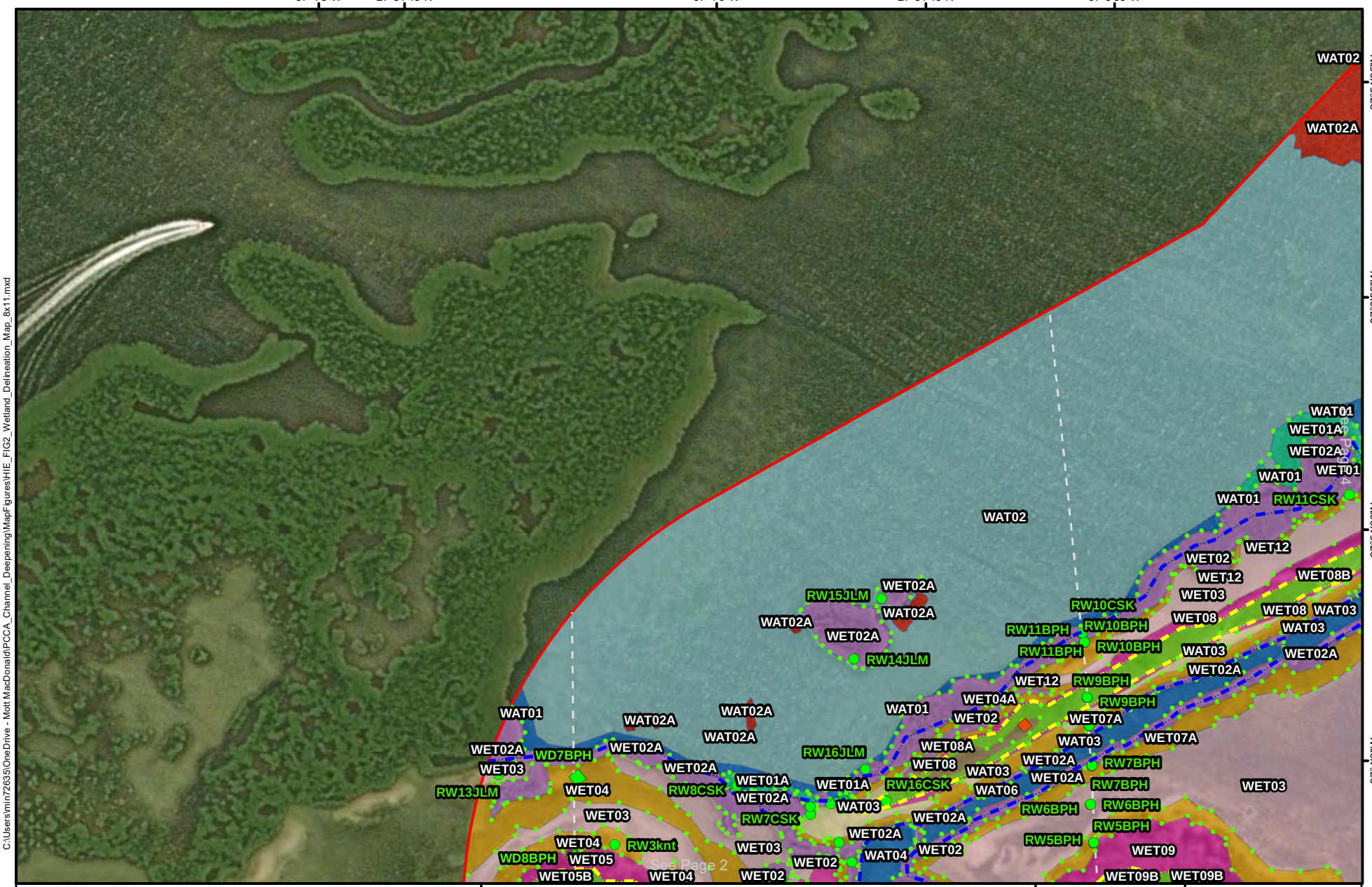
Rev. Date: 10/11/2021

Page: 1 of 1



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High Tide Line
Mean High Water
Representative Upland
Representative Wetland
Upland Dataform
Wetland Dataform
Wetland Flagging
Transects
Survey Area

WETLAND DELINEATION

E1ABL
E1RF2L
E1UBL
E2ABM
E2ABN
E2EM1N
E2EM1N1
E2EM1P
E2SS3N
E2USN
PEM1C
PEM1C1
PSS1C
PSS3C
UPL

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
HIE - FIGURE 7.1

Site HIE Wetland Delineation Map Series
Aransas & Nueces County, TX

0 100 200 400 Feet

ABSOLUTE SCALE: 1:2,400

REFERENCE SCALE: 1 IN = 200 feet

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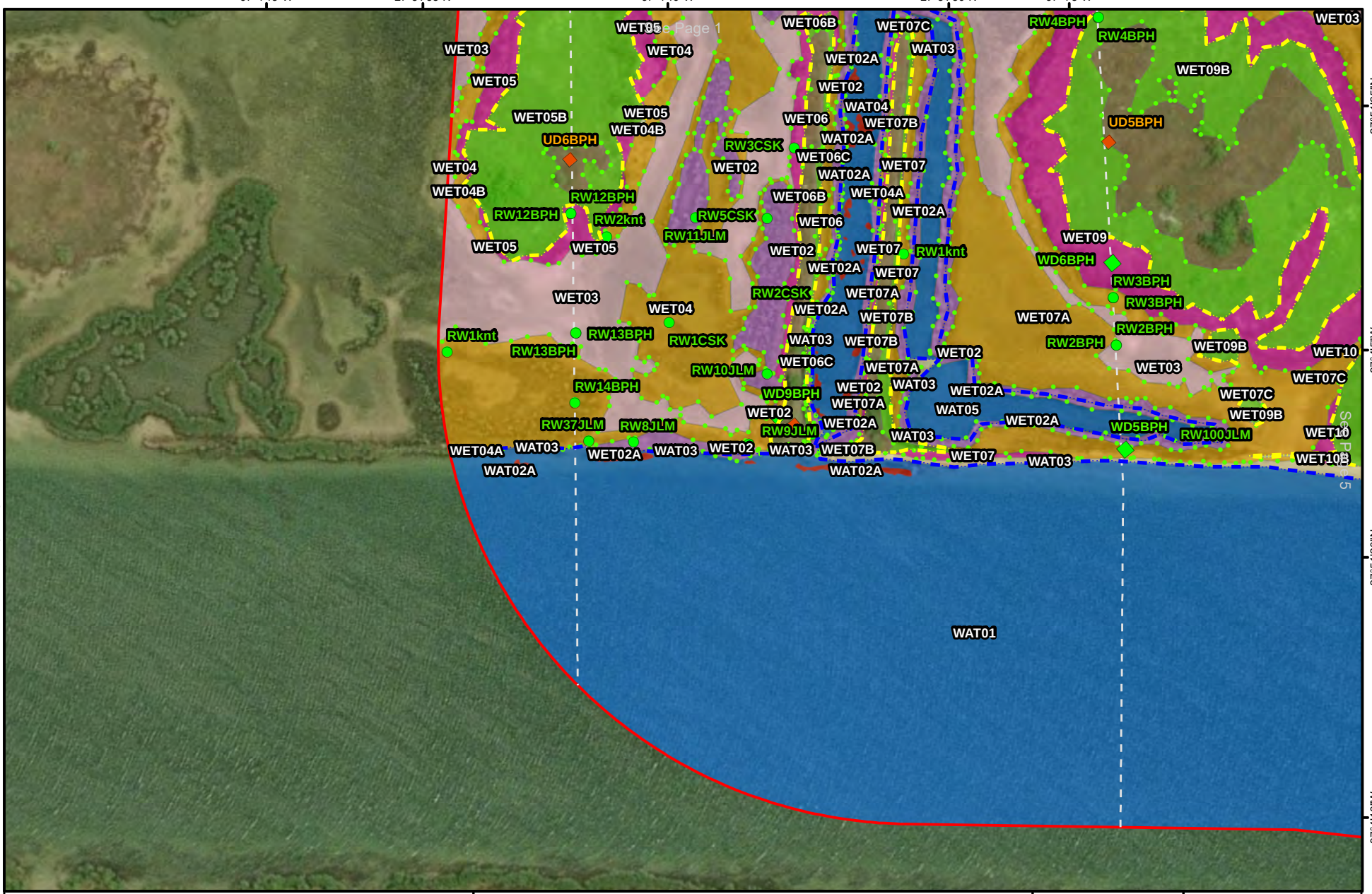

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WETLAND DELINEATION

E1ABL
E1RF2L
E1UBL
E2ABM
E2ABN
E2EM1N
E2EM1N1
E2EM1P
E2SS3N
E2USN
PEM1C
PEM1C1
PSS1C
PSS3C
UPL

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
HIE - FIGURE 7.1

Site HIE Wetland Delineation Map Series
Aransas & Nueces County, TX

0 100 200 400 Feet

N E S W

ABSOLUTE SCALE: 1:2,400

REFERENCE SCALE: 1 IN = 200 feet

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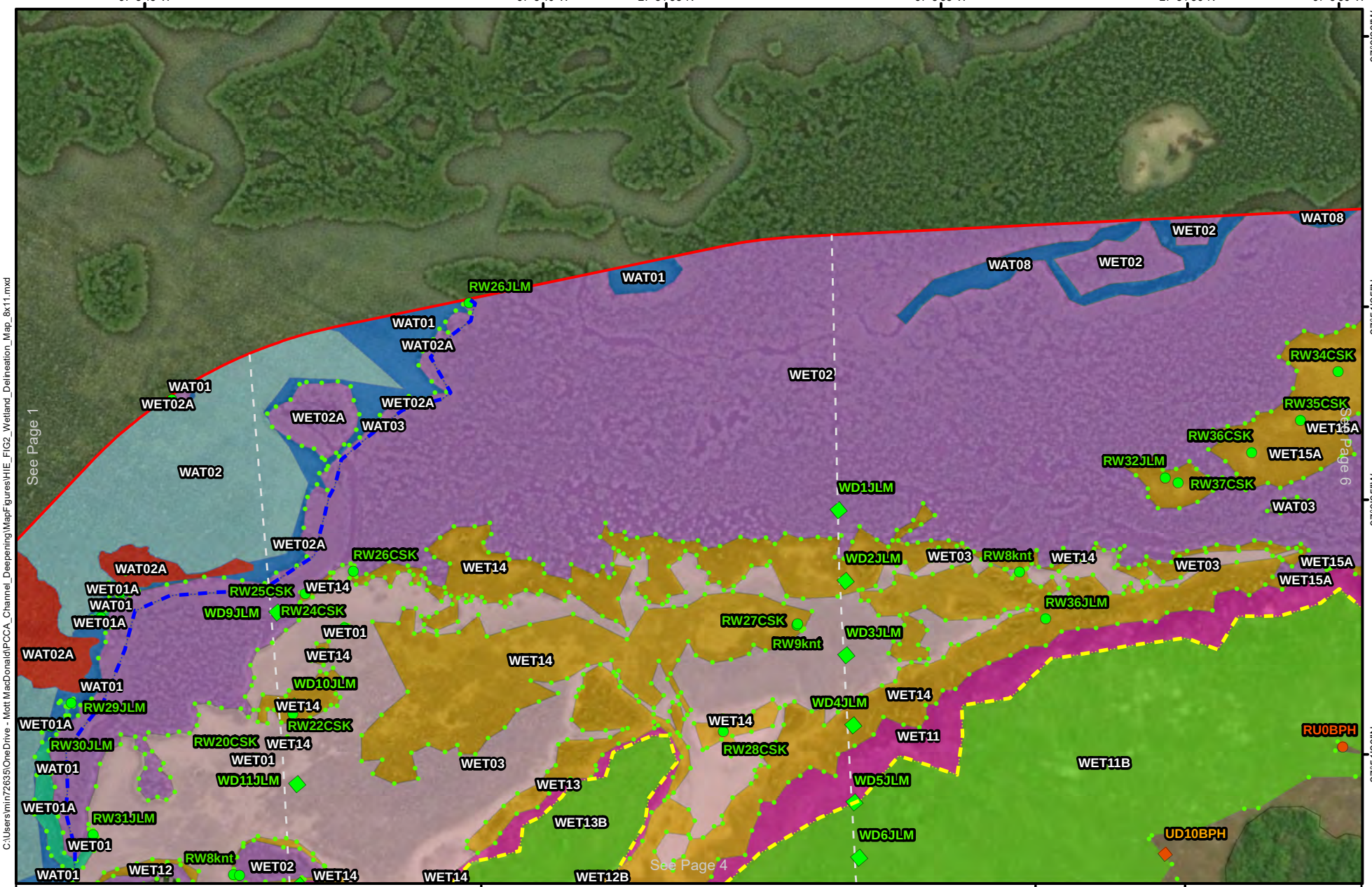

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PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
HIE - FIGURE 7.1

Site HIE Wetland Delineation Map Series
Aransas & Nueces County, TX

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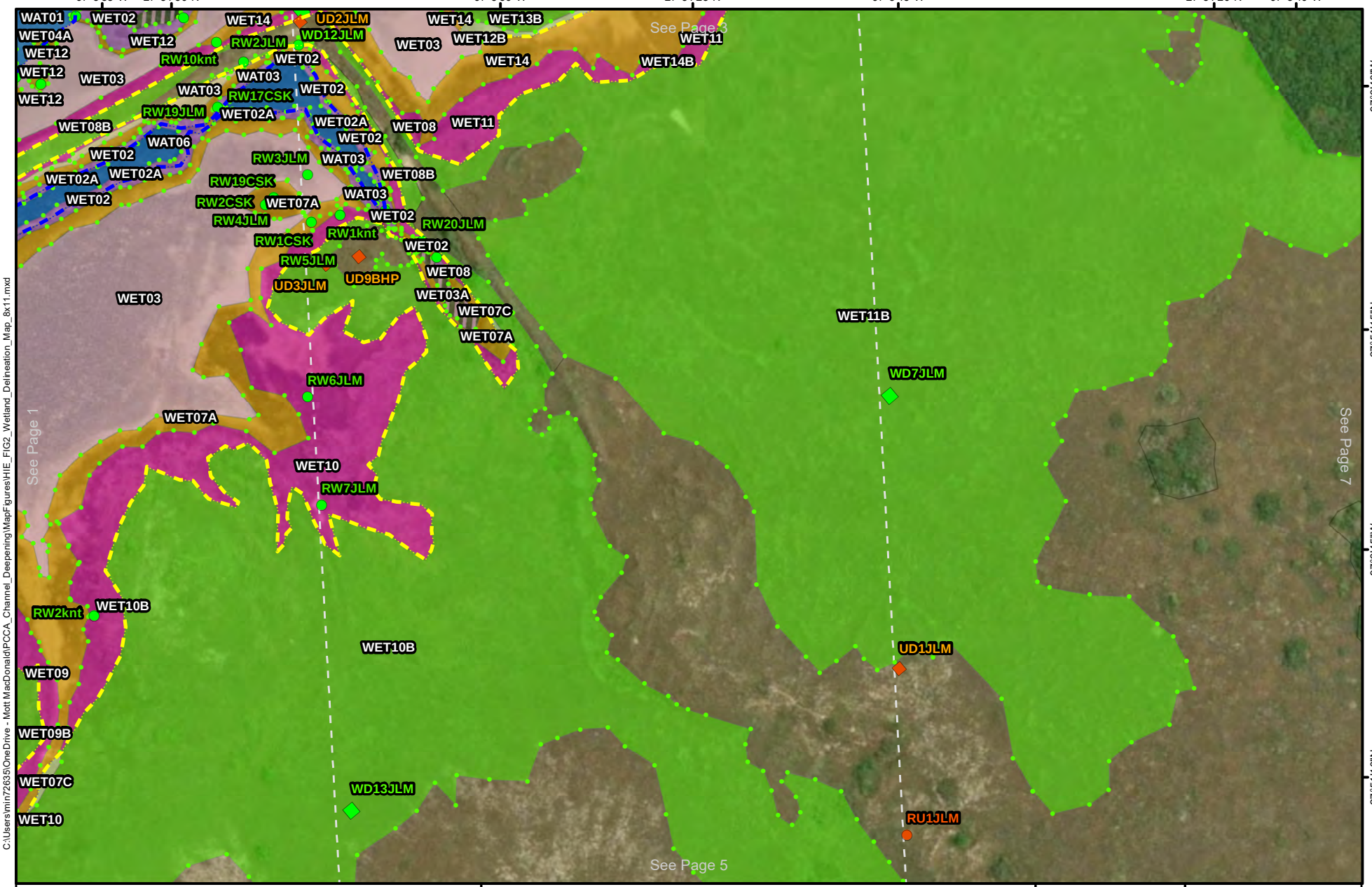

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Wetland Flagging
Transects
Survey Area

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E1ABL
E1RF2L
E1UBL
E2ABM
E2ABN
E2EM1N
E2EM1N1
E2EM1P
E2SS3N
E2USN
PEM1C
PEM1C1
PSS1C
PSS3C
UPL

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
HIE - FIGURE 7.1

Site HIE Wetland Delineation Map Series
Aransas & Nueces County, TX

0 100 200 400 Feet

N E S W

ABSOLUTE SCALE: 1:2,400

REFERENCE SCALE: 1 IN = 200 feet

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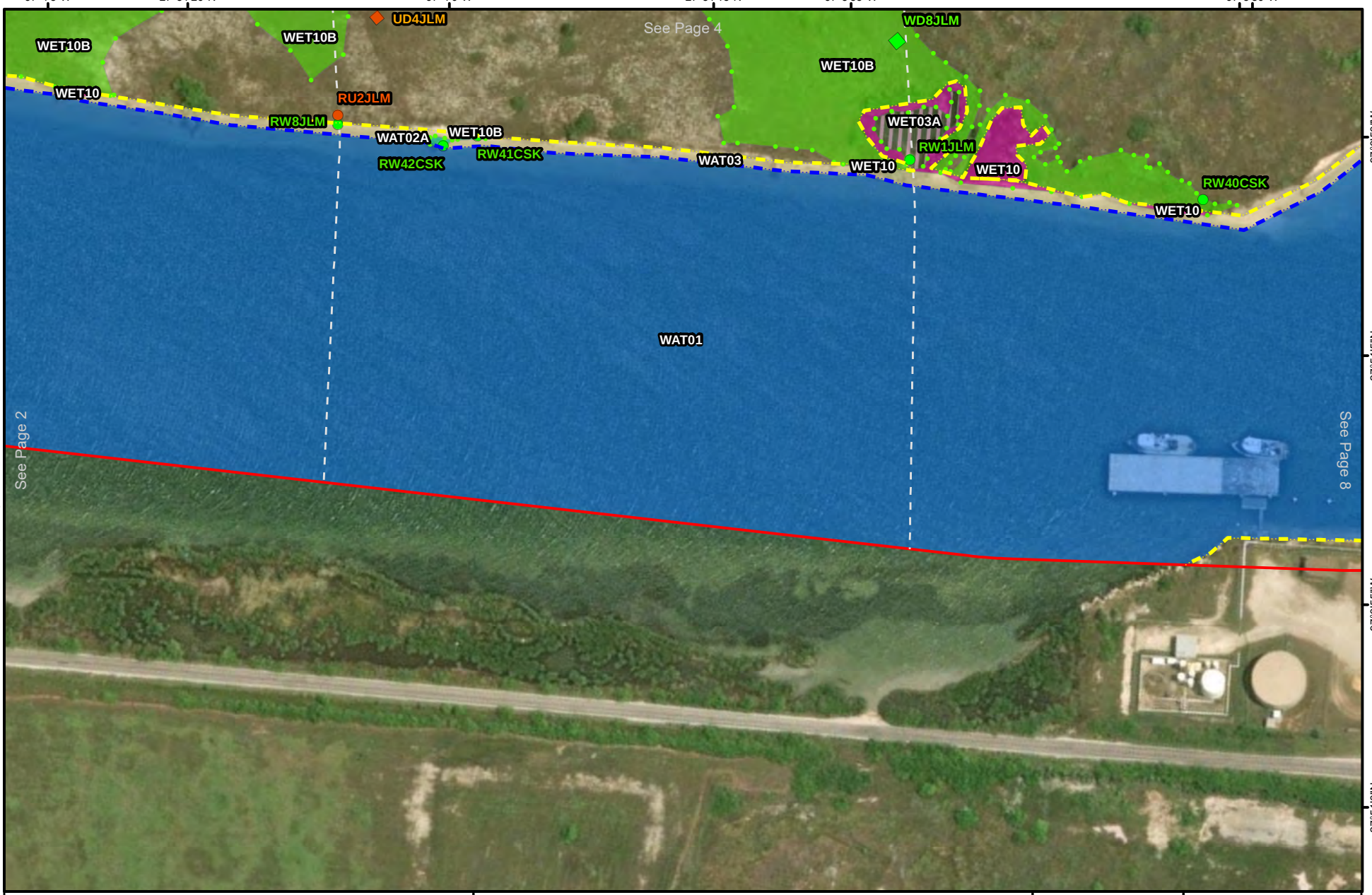

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Wetland Dataform
Wetland Flagging
Transects
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E1ABL
E1RF2L
E1UBL
E2ABM
E2ABN
E2EM1N
E2EM1N1
E2EM1P
E2SS3N
E2USN
PEM1C
PEM1C1
PSS1C
PSS3C
UPL

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
HIE - FIGURE 7.1

Site HIE Wetland Delineation Map Series
Aransas & Nueces County, TX

Feet
0 100 200 400

N E S W

ABSOLUTE SCALE: 1:2,400

REFERENCE SCALE: 1 IN = 200 feet

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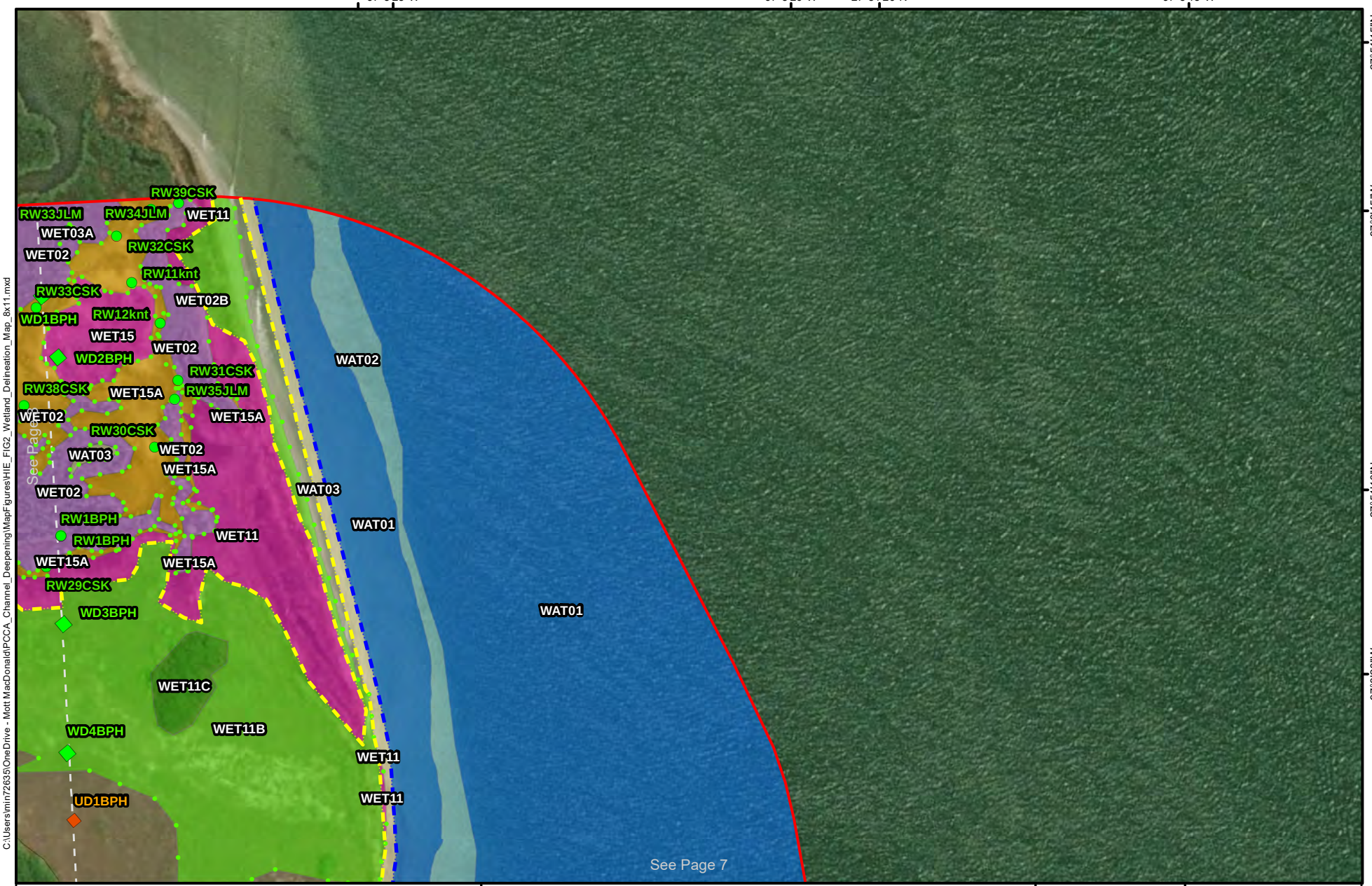

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Upland Dataform
Wetland Dataform
Wetland Flagging
Transects
Survey Area

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E1ABL
E1RF2L
E1UBL
E2ABM
E2ABN
E2EM1N
E2EM1N1
E2EM1P
E2SS3N
E2USN
PEM1C
PEM1C1
PSS1C
PSS3C
UPL

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
HIE - FIGURE 7.1

Site HIE Wetland Delineation Map Series
Aransas & Nueces County, TX

Feet
0 100 200 400

ABSOLUTE SCALE: 1:2,400

REFERENCE SCALE: 1 IN = 200 feet

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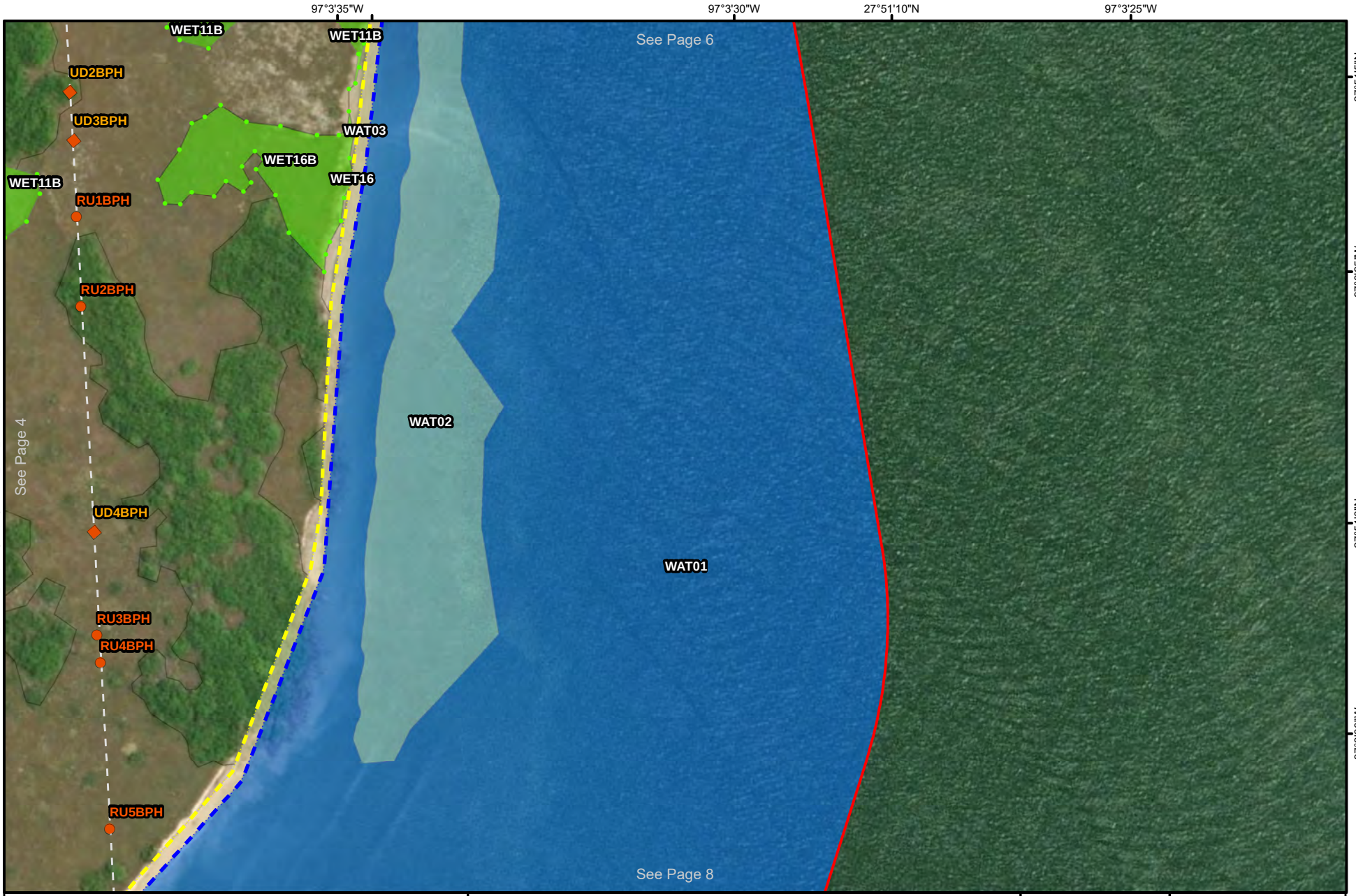

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Wetland Dataform
Wetland Flagging
Transects
Survey Area

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E2ABN
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E2EM1N1
E2EM1P
E2SS3N
E2USN
PEM1C
PEM1C1
PSS1C
PSS3C
UPL

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
HIE - FIGURE 7.1

Site HIE Wetland Delineation Map Series
Aransas & Nueces County, TX

0 100 200 400 Feet

N E S W

ABSOLUTE SCALE: 1:2,400

REFERENCE SCALE: 1 IN = 200 feet

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Wetland Flagging
Transects
Survey Area

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E2ABN
E2EM1N
E2EM1N1
E2EM1P
E2SS3N
E2USN
PEM1C
PEM1C1
PSS1C
PSS3C
UPL

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
HIE - FIGURE 7.1

Site HIE Wetland Delineation Map Series
Aransas & Nueces County, TX

0 100 200 400 Feet

N E S W

ABSOLUTE SCALE: 1:2,400

REFERENCE SCALE: 1 IN = 200 feet

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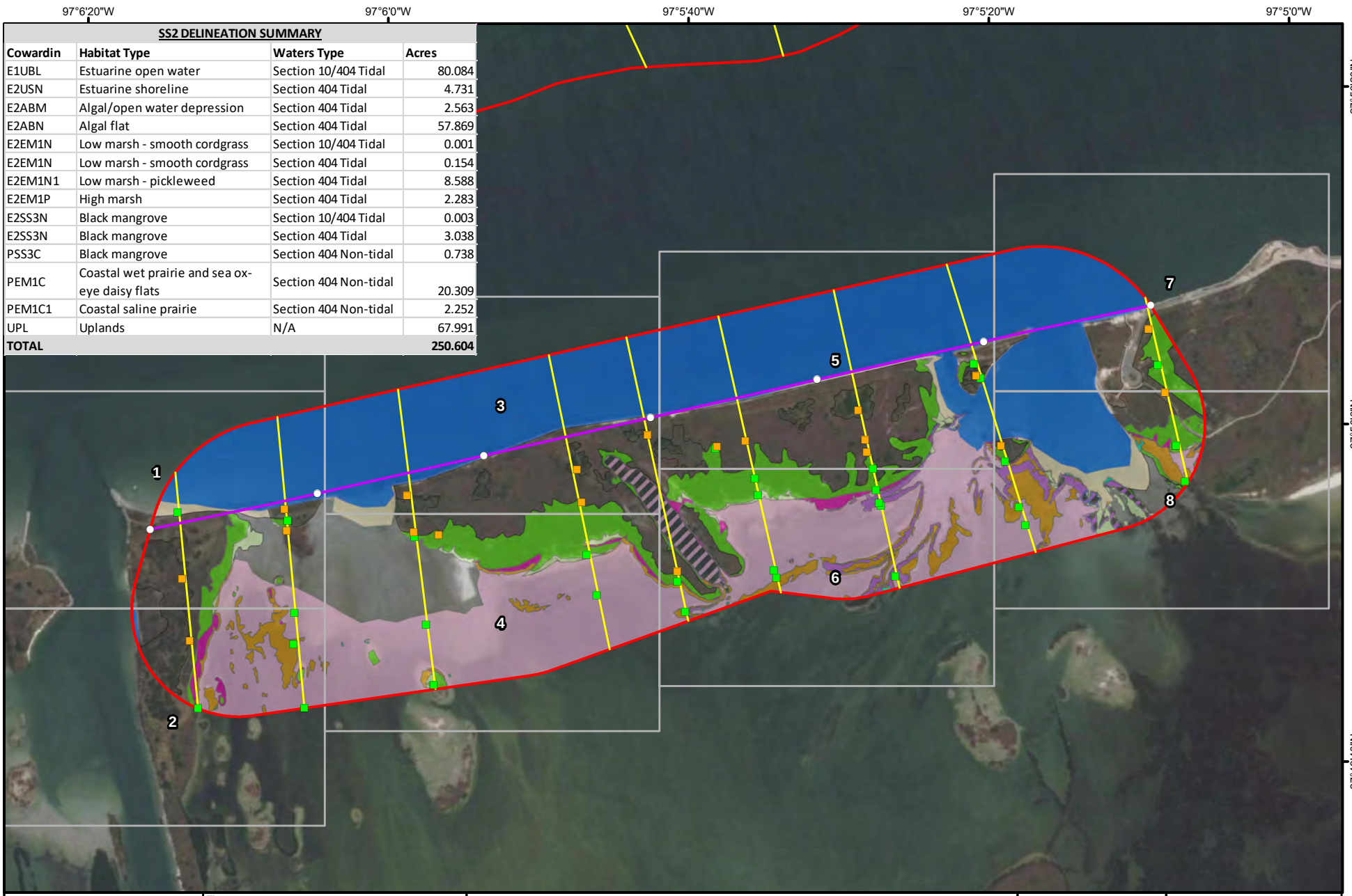

SS2 DELINEATION SUMMARY

Cowardin	Habitat Type	Waters Type	Acres
E1UBL	Estuarine open water	Section 10/404 Tidal	80.084
E2USN	Estuarine shoreline	Section 404 Tidal	4.731
E2ABM	Algal/open water depression	Section 404 Tidal	2.563
E2ABN	Algal flat	Section 404 Tidal	57.869
E2EM1N	Low marsh - smooth cordgrass	Section 10/404 Tidal	0.001
E2EM1N	Low marsh - smooth cordgrass	Section 404 Tidal	0.154
E2EM1N1	Low marsh - pickleweed	Section 404 Tidal	8.588
E2EM1P	High marsh	Section 404 Tidal	2.283
E2SS3N	Black mangrove	Section 10/404 Tidal	0.003
E2SS3N	Black mangrove	Section 404 Tidal	3.038
PSS3C	Black mangrove	Section 404 Non-tidal	0.738
PEM1C	Coastal wet prairie and sea ox-eye daisy flats	Section 404 Non-tidal	20.309
PEM1C1	Coastal saline prairie	Section 404 Non-tidal	2.252
UPL	Uplands	N/A	67.991
TOTAL			**250.604**

Notes:

Data Sources:
- PCCA Site Data
- Mott MacDonald Delineation
- ESRI World Imagery Layer

WETLAND DELINEATION

- Upland Dataform
- Wetland Dataform
- Baseline Segment
- Baseline
- Transects
- Survey Area
- Page Index
- E1UBL
- E2ABM
- E2ABN
- E2EM1N
- E2EM1N1
- E2EM1P
- E2SS3N
- E2USN
- PEM1C
- PEM1C1
- PSS3C
- UPL

PORT OF CORPUS CHRISTI AUTHORITY
CHANNEL DEEPENING PROJECT
SS2 - FIGURE 7.2

Site SS2 Wetland Delineation Overview Map
Nueces County, TX

0 400 800 1,600 Feet

N W E S

ABSOLUTE SCALE: 1:9,600

REFERENCE SCALE: 1 IN = 800 feet

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Page: 1 of 1

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