Gulf Coast Ecosystem Restoration Council
Finding of No Significant Impact
Dagger Point Stabilization Project - Implementation

The Gulf Coast Ecosystem Restoration Council (Council) hereby adopts the U.S. Army Corps of Engineers (USACE) Environmental Assessment (EA) included in the statement of findings for USACE permit SWG-2018-00279 approved on June 27, 2024. The Council adopts the EA in order to address requirements of the *National Environmental Policy Act* (42 U.S.C. §§ 4321 et seq.) (NEPA) associated with the approval of implementation funding for the Dagger Point Stabilization project (Dagger Point project) sponsored by the Texas Commission on Environmental Quality (TCEQ) and located within the Aransas National Wildlife Refuge (ANWR) in San Antonio Bay, Aransas County, Texas.

The Council has reviewed the EA and determined that it addresses the environmental effects of the Dagger Point project activity to be funded. On May 22, 2025, the Council opened a public comment period on this proposed project and the associated environmental compliance documentation. This public notice also sought comment on the Council's proposals to approve funding for other Council activities sponsored by the TCEQ under the Council's Funded Priorities List (FPL) 3b. The public comment period was 30 days and ended on June 21, 2025. The Council received multiple comments which can be reviewed in the RESTORE Council Proposed FPL 3b Amendment Bundle Response to Public Comments dated July 11, 2025.

The Council has determined that approval of funding for the Dagger Point project would not result in a significant effect on the human environment. The following is a brief description of the activity to be funded, the EA being adopted by the Council, and contact information pertaining to this action.

Funded Activity

The Council is approving a total of $12,859,851 in implementation funding for the Dagger Point project, which is part of the Texas Shoreline Protection Through Living Shorelines Program sponsored by the TCEQ. This total amount consists of $4,709,851 to be reallocated from the Texas Coastal Water Quality Program and $8,150,000 originally budgeted in Category 2 for the Texas Shoreline Protection Through Living Shorelines Program set forth in FPL 3b. Since the publication of FPL 3b, all environmental compliance necessary for a Council vote to approve implementation funding for the Dagger Island project has been completed. FPL 3b was developed pursuant to the *Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States Act of 2012* (RESTORE Act) (33 U.S.C. § 1321(t) and *note*).

The Dagger Point project will construct a five-mile living shoreline consisting of an offshore segmented rock breakwater, armored toe protection at eroded bluffs, a groin field, and sand placement to protect an eroding, highly vulnerable bay shoreline located at Dagger Point within the ANWR. This living

shoreline will protect approximately 240 acres of existing estuarine marsh and shoreline habitat and will be implemented in partnership with the Texas General Land Office, the Coastal Bend Bays and Estuaries Program, the U.S. Fish and Wildlife Service (USFWS), and the Matagorda Bay Mitigation Trust. The constructed breakwater will dampen wave action and provide shoreline stabilization to support marsh habitat that is critical to wildlife including federally endangered colonial nesting birds and whooping cranes.

More information on the RESTORE Act and FPL 3b can be found at www.restorethegulf.gov.

Environmental Assessment Adopted

The EA is hereby incorporated by reference into this Council finding, consistent with the Council's NEPA Procedures (80 FR 25680-25691 (May 5, 2015)). Prepared pursuant to NEPA, the EA analyzes the environmental impacts and cumulative effects of and alternatives for the Dagger Point project. In addition to the analysis of environmental consequences included in the EA, the USACE and the ANWR have also completed additional environmental compliance coordination for the *Fish and Wildlife Coordination Ac*t (FWCA), the *Endangered Species Act* (ESA), the *Magnuson-Stevens Fishery Conservation and Management Act* (MSA), and the *National Historic Preservation Act* (NHPA) in coordination with the National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service (USFWS), the State Historic Preservation Office, and the Texas Historical Commission.

Environmental Conditions

In addition to NEPA, the Council has an independent responsibility to comply with all other applicable Federal laws. The Council has received concurrence on adoption of the EA with respect to the Dagger Point project from the Federal agencies with responsibility for administering the laws applicable to this action. To ensure compliance with FWCA, ESA, MSA, NHPA, and other relevant laws, the Council will require that the sponsor of the project adhere to all applicable conditions in the USACE permit authorization and the associated environmental compliance documents. Compliance with these conditions is mandatory and serves to limit the environmental effects of an action to those that are insignificant, discountable or beneficial, and do not result in take or adverse effects to designated critical habitat. The TCEQ is also responsible for ensuring that any contractors that may work on this project are aware of and comply with all of these environmental compliance requirements.

Finding of No Significant Impact

Based on an independent review of the information and analysis provided in the EA, the Council hereby issues this Finding of No Significant Impact (FONSI) for the Dagger Point project. The EA is incorporated herein by reference. In making this determination, the Council has coordinated with the TCEQ, the sponsor of the activity. The Council has authorized the Executive Director of the Council to execute the FONSI on its behalf.

Determination by Responsible Official

I have determined that this activity would not have a significant effect on the human environment.

Mary S. Walker
Executive Director, Gulf Coast Ecosystem Restoration Council

(Signature) MARY WALKER Digitally signed by MARY WALKER Date: 2025.07.18 14:02:07 -05'00'

For Further Information

For further information, please contact Heather Young, Senior Advisor for Ecosystem Restoration and Environmental Compliance, Gulf Coast Ecosystem Restoration Council, at (504) 252-7716 or by e-mail at heather.young@restorethegulf.gov.

MEMORANDUM FOR RECORD

SUBJECT: Department of the Army Environmental Assessment and Statement of Findings for the Above-Referenced Standard Individual Permit Application

This document constitutes the Environmental Assessment, Section 404(b)(1) Guidelines Evaluation, Public Interest Review, and Statement of Findings for the subject application.

Introduction and Overview

Information about the proposal subject to one or more of the United States Army Corps of Engineers' (Corps') regulatory authorities is provided in Section 1, detailed evaluation of the activity is found in Sections 2 through 11 and findings are documented in Section 12 of this memorandum. Further, summary information about the activity including administrative history of actions taken during project evaluation is attached (ORM2 Summary) and incorporated in this memorandum.

1.1 Applicant name

U.S. Fish and Wildlife Service (FWS)
Attn: Mr. Joe Saenz

1.2 Activity location

The project site is on San Antonio Bay along the eastern shoreline of the Aransas National Wildlife Refuge (ANWR) in its Blackjack Unit. The Blackjack Unit is bounded by St. Charles Bay on the west, San Antonio Bay on the east, and the Gulf Intracoastal Waterway (GIWW) along the south. It is ten miles long northeast to southwest and two to seven miles wide northwest to southeast. The site is approximately eight miles south southeast of Austwell, in Aransas County, Texas. The project can be located on the U.S.G.S. quadrangle map titled: Tivoli SE, Texas.

1.3 Description of activity requiring permit

Construct a shoreline protection and bluff stabilization project for the eroding shoreline of the ANWR along San Antonio Bay, particularly along Dagger Point. The project will include a continuous breakwater (BW) around Dagger Point, a five-mile series of segmented rock BWs on the northern and southern alignments parallel and offshore of the existing shoreline, and armored toe protection to the eroding high bluffs along the Dagger Point shoreline. A low-crested rubble-mound (rock) structure is proposed for the BWs and as toe protection for the high bluff areas. The BW structures include a maximum crest elevation between +3.0 to +4.0 feet (ft) North American Vertical Datum of 1988 (NAVD88) with a crest width of 10 ft. The bayward face of the BW will have a slope of 1-ft vertical drop for every 5 feet of horizontal run (5H:1V) with the landward slope of 3H:1V. Approximately 4,200 feet of armored toe protection will be constructed at the base of the high bluffs including a series of near shore BWs and groins with sand fill constructed along a 1,300-foot section of high bluffs at Dagger Point. Approximately 11,000 cubic yards of sand material of similar grain size and mineralogy to native sediment will be obtained from a commercial upland source. The sand will meet the USACE requirements outlined in 404(b)(1) guidelines and the Inland Testing Manual as

appropriate. Low bluffs will be regraded to reduce the angle of the slope and then planted with vegetation.

1.3.1 Proposed avoidance and minimization measures

The applicant will use light loading barges to avoid dredging impacts to the water bottom of the project area. Rock barges will be staged in deeper water areas in the bay and then loaded to smaller barges to lighten the load and decrease the required draft of the vessels to the project site. Depending on the contractor's means and methods and the feasibility of construction, landside access of equipment, materials, and personnel may be used for construction of the high bluff protection and regrading of low bluffs. If needed, upland staging areas and temporary access ramps to the shoreline will be established near the fishing pier located 6,500 feet to the northwest of Dagger Point or from near the observation tower 9,300 feet to the south. Heavy equipment will travel along the beach during low tide periods and mats will be used to minimize impacts to sensitive areas. Reshaping and stabilization of areas affected by construction activities will be performed as part of demobilization activities. The applicant removed the use of dredged material for the project as a source for fill material in order to minimize potential project impacts.

1.3.2 Proposed compensatory mitigation

No mitigation is proposed. The project will protect the existing shoreline by reducing wave energy and erosion to preserve the remaining estuarine marsh and coastal bluff habitats.

1.4 Existing conditions and any applicable project history

The affected environment under the proposed action is associated with the 5-mile length of the eastern shoreline of the Blackjack Unit on San Antonio Bay. The eastern shoreline of the Blackjack Unit along San Antonio Bay is exposed to erosive forces due to water and wind acting on the shoreline. In general, the wave climate in San Antonio Bay consists of locally generated waves that are the result of seasonal wind patterns as well as tropical and extratropical storms. The primary wind and wave direction at the project area is from the southeast. Construction activities will be in a 210-acre area that consists of exposed shoreline, low and high estuarine marsh, submerged aquatic vegetation (SAV), open water, low and high bluffs, and red bay-live oak forest.

1.4.1 Jurisdictional Determination

Is this project supported by a jurisdictional determination? No Jurisdictional Determination

1.5 Permit authority

Table 1 – Permit Authority	
Section 10 of the Rivers and Harbors Act (33 USC 403)	X
Section 404 of the Clean Water Act (33 USC 1344)	X
Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 USC 1413)	

Scope of review for National Environmental Policy Act (i.e., scope of analysis), Section 7 of the Endangered Species Act (i.e., action area), and Section 106 of the National Historic Preservation Act (i.e., permit area)

1.6 Determination of scope of analysis for National Environmental Policy Act (NEPA)
The scope of analysis always includes the specific activity requiring a Department of the Army permit that is located within the Corps' geographic jurisdiction. In addition, we have applied the four factors test found in 33 CFR Part 325, Appendix B to determine if there are portions of the larger project beyond the limits of the Corps' geographic jurisdiction where the federal involvement is sufficient to turn these portions of an essentially private action into a federal action.

Based on our application of the guidance in Appendix B, we have determined that the scope of analysis for this review includes the Corps geographic jurisdiction and upland portions beyond the Corps geographic jurisdiction.

These upland components include staging areas for materials and equipment immediately adjacent to the project site as described in the project description (Section 1.3) of this document. These components have been determined to be within our scope of analysis as the extent of federal involvement is sufficient to turn these portions of an essentially private action into a federal action with the resulting environmental consequences of the larger project essentially being products of the Corps' permit action.

Final description of scope of analysis: The scope of analysis will include those jurisdictional waters within the project's review area as well as the associated upland areas as described above.

1.7 Determination of the Corps' action area for Section 7 of the Endangered Species Act (ESA): For the purposes of Section 7 of the ESA, the "action area" means all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 CFR 402.02). "Action" is defined to mean all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by federal agencies in the United States or upon the high seas. In the context of this decision, the federal action being contemplated is authorization of an activity under one or more of the Corps' regulatory authorities.

The action area includes those areas comprising waters of the US that will be directly affected by the proposed work or structures, as well as activities outside of waters of the US.

Final description of the action area: The action area will cover those areas as described in the final NEPA scope analysis.

1.8 Determination of Corps' permit area for Section 106 of the National Historic Preservation Act (NHPA): The scope of the NHPA review requires the Corps to

determine the “permit area”. The permit area for an undertaking is essentially the area of the undertaking and all other activities the Corps has federal control over and responsibility for evaluating the effects of such activities on historic properties. The permit area is defined in 33 CFR 325, Appendix C and means those areas comprising waters of the United States that will be directly affected by the proposed work or structures and uplands directly affected as a result of authorizing the work or structures. The following three tests in Appendix C (1)(g)(1) must all be satisfied for an activity undertaken outside of waters of the United States to be included within the “permit area”: 1) Such activity would not occur but for the authorization of the work or structures within the waters of the United States; 2) Such activity is integrally related to the work or structures to be authorized within waters of the United States (or, conversely, the work or structures to be authorized must be essential to the completeness of the overall project or program); and 3) Such activity is directly associated (first order impact) with the work or structures to be authorized. Appendix C contains several examples of how to apply these three tests. The Corps is not responsible for identifying or assessing potentially eligible historic properties outside the permit area. The Corps will however consider effects of undertakings on any known historic properties that may occur outside the permit area (reference 33 CFR 325, Appendix C (5)(f)). Collectively, this evaluation of effects to historic properties both within and outside the permit area reasonably equates to the “Area of Potential Effect” as defined in 36 CFR 800.

The permit area includes those areas comprising waters of the United States that will be directly affected by the proposed work or structures, as well as activities outside of waters of the U.S. because all three tests identified in 33 CFR 325, Appendix C(g)(1) have been met.

Final description of the permit area: The action area will cover those areas as described in the final NEPA scope analysis.

Purpose and Need

1.9 Project purpose and need

Project purpose and need for the project as provided by the applicant and reviewed by the Corps:

The purpose is to protect the existing shoreline of this part of the ANWR by reducing wave energy and erosion. The project is needed to preserve the remaining estuarine marsh and coastal bluff habitats in this area. Additionally, the project is needed to protect public infrastructure such as access roads, parking areas, and viewing piers from continued erosion and wave impacts.

1.10 Basic project purpose

Basic project purpose, as determined by the Corps: The basic purpose of this project is erosion control.

1.11 Water dependency determination

The activity does not require access or proximity to or siting within a special aquatic site

to fulfill its basic purpose. Therefore, the activity is not water dependent. The purpose of the proposed offshore placement of the breakwater is for erosion control of the existing shoreline and protection of existing special aquatic sites adjacent to the shoreline.

1.12 Overall project purpose

Overall project purpose, as determined by the Corps: The overall project purpose is to construct breakwater and bluff stabilization structures for erosion control of the existing shoreline.

Coordination

1.13 Public Notice Results

The results of coordinating the proposal on public notice are identified below, including a summary of issues raised, any applicant response and the Corps' evaluation of concerns.

Were comments received in response to the public notice? Yes

Were comments forwarded to the applicant for response? Yes

Was a public meeting and/or hearing requested, and if so, was one conducted?

No, no public hearing or meeting was requested.

Comments received in response to public notice:

Table 2 – Public Notice Comments

Agency and/or Person provided with notice of proposal	Response received	Date Received	Comments/Issues Raised
US Environmental Protection Agency (EPA)	No		
US Fish and Wildlife Service (FWS)	No		
National Marine Fisheries Service - Habitat Conservation Division (NMFS-HCD)	Yes	15 June 2022	No Objection
National Marine Fisheries Service - Protected Resources Division (NMFS-PRD)	No		
US Coast Guard (USCG)	No		
Texas Commission on Environmental Quality (TCEQ)	No		

Table 2 – Public Notice Comments			
Agency and/or Person provided with notice of proposal	Response received	Date Received	Comments/Issues Raised
Texas Parks and Wildlife Department (TPWD)	Yes	21 June 2022	See below for discussion.
Texas General Land Office (GLO)	No		
Texas State Historic Preservation Officer (SHPO)	No		
Adjacent Land Owners	No		
Other Agency	No		
Non-Profit	No		
General Public	Yes	31 May 2022	See below for discussion

Additional discussion of submitted comments, applicant response and/or Corps' evaluation:

Comment 1:
TPWD

The TPWD recommended the following:

1. The overall length of the proposed structures should be verified.
2. Additional information may be needed to determine if breakwater gaps will provide adequate egress of aquatic life during extreme low tide events.
3. To avoid and minimize turbidity impacts, re-grading activities at the toe of the bluff should occur after the breakwater is in place. If higher turbidity levels become an issue during construction, silt curtains should be employed where appropriate.

Applicant's Response:

1. The proposed structure lengths are: five miles of a segmented rubble-mound breakwater; 4,200 feet of armored toe protection along the base of the eroding high bluffs; and 1,300 feet of groin field to protect the high bluff shoreline in the immediate vicinity of Dagger Point.
2. The length of each northern and southern breakwater segment is expected to be 200 feet long (and will not exceed 500 feet) with a gap of around 30 feet from the crest of each subsequent segment to allow for faunal ingress and egress. Modeling of wave energy was performed to optimize the structure segment lengths and gaps; and shorter segments were designed to facilitate fish passage. Each gap will be underlain by a rock sill to prevent scouring. The gap sill elevation will also be determined during final design but is expected to be below the mean lower low water (MLLW) elevation (0.95 feet NAVD 88) at 1.0 to 1.5 feet above the breakwater base elevation of -1.5 to -2.0 feet NAVD 88.
3. Timing of the grading will be dependent on the selected contractor. The applicant will encourage the selected contractor to perform the low bluff construction after the

breakwater is installed. If that is not feasible, the contractor will be required to install BMPs to control turbidity per the TCEQ 401 Water Quality Certification letter to minimize impacts to SAV and oysters.

Corps' Evaluation: The applicant's answers were coordinated with TPWD by electronic mail on 23 August 2022. The TPWD responded by electronic mail on 29 August 2022 stating the applicant's response had resolved that agency's concerns, and the Corps concurs.

Comment 2:
General Public (Kenneth Teague):

A member of the general public commented as follows:

1. The Clean Water Act, Section 404(b)(1) Guidelines require consideration of alternatives demonstration of avoidance and minimization of impacts to aquatic habitats, and only the Least Environmentally Damaging Practicable Alternative can be permitted. This PN does not demonstrate if any of these requirements have been met.
2. What modeling or other engineering analyses were done to support the specific structures proposed?
3. Seagrass beds, oyster reefs, and reference sites should be mapped and the areas monitored for project related impacts during construction.
4. Any unavoidable direct or indirect impacts to seagrasses and/or oyster reefs must be mitigated.

Applicant's Response:

1. An alternatives analysis and avoidance and minimization were provided in Attachment B, Environmental Assessment of the application.
2. As noted in the application, a range of breakwater configurations and distances from the existing shoreline was evaluated to assess how different geometries and locations may perform under various wave and water level conditions, in regard to wave attenuation.
3. SAV surveys were performed in accordance with survey methodology based on previous efforts approved by TPWD, FWS, and NMFS and the report was provided in the permit application. In addition, a SAV survey will be performed prior to construction to determine the location of SAV beds and buffers of 20 to 30 feet between the breakwaters and any submerged aquatic vegetation (SAV) and oyster reefs identified during the SAV and oyster reef survey will be established as detailed in the application.
4. Per the application and the above response, buffers were established with NMFS and TPWD prior to submitting the permit.

Corps Evaluation: The applicant's response adequately addresses the issues raised by Mr. Teague. The Corps considers these concerns to be resolved.

1.14 Additional issues raised by the Corps
Internal coordination conducted within the Galveston District Corps (Corps) offices on: 26 April 2022

The Programs and Project Management Division, Real Estate (RE) Division, Operations Division (OD-Navigation Branch and OD-Operations Branch), Engineering and Construction Division (including area offices) (E&C), Southwestern Division Regional Planning and Environmental Center (RPEC), Project Management Office (PM), and the Regulatory Division's Compliance Branch (RD-C) and Corps staff archeologist (RD-P) were coordinated with during the Internal Review period.

Table 3 – Corps Internal Coordination Comments

Corps Office	Response received	Date Received	Comments/Issues Raised
RE	Yes	3 May 2022	No federal interests
OD-Navigation Branch	Yes	2 May 2022	Adjacent federal interest; See below for discussion
OD-Operations Branch	Yes	29 April 2022	No federal interests
E&C	No		
RPEC	No		
PM	No		
RD-C	No		
RD-P	Yes	26 April 2022	See Section 10.3

The Navigation Branch commented that there is a Federal Interest in the vicinity of the project area and additional information was needed to determine if the proposed project could impact the adjacent Federal Interest. The permit application package was forwarded to the appropriate Operations Manager for further review. The Operations Branch commented that there were no federal interests located within the project area.

1.15 Comments regarding activities and/or effects outside of the Corps' scope of review: N/A

Alternatives Analysis
(33 CFR Part 325 Appendix B, 40 CFR 230.5(c), 40 CFR 1501, and RGL 88-13). An evaluation of alternatives is required under NEPA for all jurisdictional activities. NEPA requires discussion of a reasonable range of alternatives, including the no action alternative, and the effects of those alternatives. An evaluation of alternatives is required under the Section 404(b)(1) Guidelines for projects that include the discharge of dredged or fill material to waters of the United States. Under the Section 404(b)(1) Guidelines, practicability of alternatives is taken into consideration and no alternative may be permitted if there is a less environmentally damaging practicable alternative.

1.16 Site selection/screening criteria
In order to be practicable, an alternative must be available, achieve the overall project

purpose (as defined by the Corps) and be feasible when considering cost, logistics and existing technology.

Criteria for evaluating alternatives as evaluated and determined by the Corps:

Location along severely eroding Dagger Point shoreline area in ANWR.

1.17 Description of alternatives

1.17.1 No action alternative
The no action alternative results in no construction activity requiring a Corps permit, and may include either the applicant electing to modify the proposal to eliminate work in waters of the US, or denial of the permit. In this instance a permit authorizing the discharge of fill material into waters of the US would either not be required or be denied. In either case no fill would be authorized to be discharged into any waters of the US or special aquatic site. The proposed project site would not be developed for this project and the existing conditions on the project site would remain the same and erosion will continue.

1.17.2 Off-site alternatives
Off-site alternative 1: Due to project constraints of providing erosion protection and stabilization within a specific area of ANWR, off-site alternatives were not considered.

1.17.3 On-site alternatives
On-site alternative 1 (applicant's preferred alternative): This alternative involves the strategic placement of a segmented rubble-mound breakwater offshore and parallel to a 5-mile length of the eastern shoreline of the Blackjack Unit along the -1.5- to -2.0-foot NAVD 88 contour and building an armored structural toe protection constructed at the base of eroding high bluffs with regrading of eroded low bluff scarps. This alternative would mitigate wind and wave erosion and therefore increase the long-term stabilization of shoreline and associated habitat along Dagger Point and protection for ANWR infrastructure.

On-site alternative 2: Modeling was used to evaluate a range of breakwater configurations and distances from the existing onsite shoreline to determine the most effective design configuration and if other minimization measures could be incorporated to decrease the environmental impacts. Alternatives included a rock breakwater along the -1.0 foot NAVD 88 contour, rock breakwater along the -3.0-foot NAVD88 contour, and a 3 mile rock breakwater with 2 miles of proprietary materials (e.g., oysterbreak & reefblk).

1.18 Alternatives evaluation under the Section 404(b)(1) Guidelines and NEPA
No-action alternative: This alternative was determined not to be practicable. Although there is no up-front cost to this alternative, doing nothing will result in much higher repair costs in the future. The no-action alternative would lead to a continued high rate of erosion and potential loss of ANWR infrastructure and habitat area. For these reasons, the no-action alternative does not meet the project needs.

The On-Site Alternative 1 was evaluated using modeling and was determined to be the optimal configuration for providing the highest amount of wave attenuation while avoiding impacts to SAV and oyster reefs and maintaining enough water depth for constructability.

For Alternative 2, the rock breakwater along the -1.0-foot contour would have resulted in 6.2 acres of SAV of impacts and increased the difficulty of construction access due to decrease in available draft for construction equipment. The -3.0-foot contour breakwater would have resulted in 1.5 acres of oyster impacts, an additional 6 acres of waterbottom impacts, and less protection provided to the shoreline which would result in continued erosion. The breakwater and proprietary materials configuration was determined to be less effective due to construction and maintenance costs of the proprietary materials. Therefore, the On-Site Alternative 1 plan was determined to be the least environmentally damaging practicable alternative under the 404(b)(1) Guidelines and the environmentally preferable alternative under NEPA.

1.19 Least environmentally damaging practicable alternative under the Section 404(b)(1) Guidelines

The purpose of the project is to protect the existing shoreline in ANWR from ongoing erosion as well as help preserve the remaining estuarine marsh and coastal bluff habitats and provide opportunities for habitat restoration. Additionally, public access and infrastructure, such as roads, parking areas, and viewing piers would be protected from continued erosion and wave impacts. The no-action alternative is not practicable since the project would not be built and shoreline erosion would continue. The modeling study for Onsite Alternative 1 (Preferred Alternative) shows this alternative provides the optimal configuration for providing the highest amount of wave attenuation while avoiding impacts to SAV and oyster reefs and maintaining enough water depth for constructability. Although modeling studies were done on several other on-site alternatives the studies determined that on-site alternative 1 was the only alternative that addressed criteria submitted by the applicant and was the least environmentally damaging practicable alternative. Therefore, on-site alternative 1 was the only alternative considered for further evaluation.

Evaluation for Compliance with the Section 404(b)(1) Guidelines

The following sequence of evaluation is consistent with 40 CFR 230.5

1.20 Practicable alternatives

Practicable alternatives to the proposed discharge consistent with 40 CFR 230.5(c) are evaluated in Section 5.

The statements below summarize the analysis of alternatives:

In summary, based on the analysis in Section 5 above, the no-action alternative, which would not involve discharge into waters of the United States, is not practicable.

For those projects that would discharge into a special aquatic site and are not water dependent, the applicant has demonstrated there are no practicable alternatives that do not involve special aquatic sites.

It has been determined that there are no alternatives to the proposed discharge that would be less environmentally damaging (Subpart B, 40 CFR 230.10(a)).

The proposed discharge in this evaluation is the practicable alternative with the least adverse impact on the aquatic ecosystem, and it does not have other significant environmental consequences.

1.21 Candidate disposal site delineation (Subpart B, 40 CFR 230.11(f))
Each disposal site shall be specified through the application of these Section 404(b)(1) Guidelines:

Table 4 – Candidate Disposal Site Delineation	
Depth of water at the disposal site	X
Current velocity, direction, and variability at the disposal site	X
Degree of turbulence	
Stratification attributable to causes such as obstructions, salinity, or density profiles at the disposal site	
Discharge vessel speed and direction	
Rate of discharge	
Ambient concentration of constituents of interest	
Dredged material characteristics, particularly concentrations of constituents, amount of material, type of material (sand, silt, clay, etc.) and settling velocities	X
Number of discharge actions per unit of time	
Other factors of the disposal site that affect the rates and patterns of mixing	

Rock rubble that will better withstand storm impacts and wave energy will be used for construction of the breakwaters. The low-crested rubble-mound (rock) breakwater design can be efficiently maintained and adapted once constructed. Wave modeling was used to determine the highest amount of wave attenuation while avoiding SAV and oyster reef impacts and maintaining enough water depth for constructability. Modeling was also used to optimize the structure segment lengths and gaps. Sand used to backfill the shoreline protection area at Dagger Point as toe protection for the eroding shoreline bluffs will be confined behind a rock-armored toe protection structure and will not affect any aquatic habitats.

1.22 Potential impacts on physical and chemical characteristics of the aquatic ecosystem (Subpart C 40 CFR 230.20-40 CFR 230.25)
The following has been considered in evaluating the potential impacts on physical and chemical characteristics:

Table 5 – Potential Impacts on Physical and Chemical Characteristics						
Physical and Chemical Characteristics	**N/A**	**No Effect**	**Negligible Effect**	**Minor Effect (Short Term)**	**Minor Effect (Long Term)**	**Major Effect**
Substrate			X			
Suspended particulates/ turbidity			X			
Water		X				
Current patterns and water circulation			X			
Normal water fluctuations		X				
Salinity gradients		X				

Discussion: Fill for the breakwater structures will consist of rock rubble that will cause minor turbidity during the initial placement of the rubble. The rocks will be inert in nature and will have no effect on water chemistry. The breakwaters will minimize wave energy, which will reduce the erosion of substrate material. Gaps in the breakwater structures minimize effects on current patterns and water circulation. Sand used to backfill the shoreline protection area at Dagger Point as toe protection for the eroding shoreline bluffs will consist of material obtained from a commercial upland source or from maintenance dredging of the GIWW in the project area. Water circulation and mixing will not be impaired by the project design, which will ensure that normal water fluctuations and salinity gradients will not be affected.

1.23 Potential impacts on the living communities or human uses (Subparts D, E and F)

1.23.1 Potential impacts on the biological characteristics of the aquatic ecosystem (Subpart D 40 CFR 230.30)
The following has been considered in evaluating the potential impacts on biological characteristics: See Table 6

Table 6 – Potential Impacts on Biological Characteristics						
Biological Characteristics	**N/A**	**No Effect**	**Negligible Effect**	**Minor Effect (Short Term)**	**Minor Effect (Long Term)**	**Major Effect**
Threatened and endangered species			X			
Fish, crustaceans, mollusks, and other aquatic organisms			X			
Other wildlife			X			

Discussion: The applicant as lead agency has determined through its Intra-Service Section 7 Biological Evaluation, dated 12 April 2022, that the project may affect, but is not likely to adversely affect threatened and endangered species that might be present in the project area (see administrative record). The project would have a temporary negative effect during construction activities due to disturbances to the surrounding environment in the forms of added turbidity in the water column, added human presence, and noise higher than ambient levels. Turbidity caused by project activities may affect nearby oyster and seagrass areas; however, the applicant's use of BMPs (see standard conditions listed in the TCEQ's water quality certification) should minimize any such impacts. Shoreline and shallow water habitat may be inaccessible to fish and wildlife species during project construction; however, due to the relatively small project area in comparison to the overall neighboring habitat that will remain available and the short project duration time, any such impacts should be negligible. All project effects are expected to return to normal levels once the project is complete and construction activities have ceased. The project will also not change the current baseline in such a way that the public interests in this area will suffer detrimental effects.

1.23.2 Potential impacts on special aquatic sites (Subpart E 40 CFR 230.40)
The following has been considered in evaluating the potential impacts on special aquatic sites:

Table 7 – Potential Impacts on Special Aquatic Sites

Special Aquatic Sites	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Major Effect
Sanctuaries and refuges			X			
Wetlands			X			
Mud flats	X					
Vegetated shallows			X			
Coral reefs	X					
Riffle pool complexes	X					

Discussion: The applicant states that an erosion control design was selected that will have the least environmentally damaging practicable alternative and still provide protection to the existing shoreline in the ANWR and to wetlands and other habitats in danger of destruction should ongoing erosion processes in this area be allowed to continue. The location of the proposed breakwater structure and the high bluff toe protection structures was selected to minimize impacts to WOTUS by placement at the - to -2 ft NAVD88 contour to minimize the size of structure needed while avoiding identified oyster reefs and submerged aquatic vegetation. The placement offshore is also intended to avoid and protect existing areas of emergent marsh habitat present along the current shoreline. Turbidity caused by project activities may affect nearby oyster and seagrass areas; however, the applicant's use of BMPs (see standard conditions listed in the TCEQ's water quality certification) should minimize any such impacts.

1.23.3 Potential impacts on human use characteristics (Subpart F 40 CFR 230.50)
The following has been considered in evaluating the potential impacts on human use characteristics:

Table 8 – Potential Effects on Human Use Characteristics						
Human Use Characteristics	**N/A**	**No Effect**	**Negligible Effect**	**Minor Effect (Short Term)**	**Minor Effect (Long Term)**	**Major Effect**
Municipal and private water supplies	X					
Recreational and commercial fisheries			X			
Water-related recreation			X			
Aesthetics			X			
Parks, national and historical monuments, national seashores, wilderness areas, research sites, and similar preserves			X			

Discussion: Members of the general public that utilize the ANWR will benefit from the project as it will preserve natural habitat area and protect infrastructure. The applicant has selected an erosion control design that is the least environmentally damaging practicable alternative that will provide protection to the existing shoreline in the ANWR and to wetlands and other habitats in danger of destruction should ongoing erosion processes in this area be allowed to continue. Protection of this area will all preserve existing ANWR infrastructure used to service the park and provide accessibility to the general public that utilized the ANWR.

1.24 Pre-testing evaluation (Subpart G, 40 CFR 230.60)
The following has been considered in evaluating the biological availability of possible contaminants in dredged or fill material:

Table 9 – Possible Contaminants in Dredged/Fill Material	
Physical substrate characteristics	X
Hydrography in relation to known or anticipated sources of contaminants	
Results from previous testing of the material or similar material in the vicinity of the project	
Known, significant sources of persistent pesticides from land runoff or percolation	
Spill records for petroleum products or designated hazardous substances (Section 311 of the Clean Water Act)	

Table 9 – Possible Contaminants in Dredged/Fill Material	
Other public records or significant introduction of contaminants from industries, municipalities, or other sources	
Known existence of substantial material deposits of substances which could be released in harmful quantities to the aquatic environment by man-induced discharge activities	

Discussion: Breakwater material will be pre-screened for contaminants or will consist of naturally occurring inert material.

For breakwater material It has been determined that testing is not required because the likelihood of contamination by contaminants is acceptably low and the material may be excluded from evaluation procedures.

For sand material it has been determined that testing is not required because the discharge and extraction sites are adjacent, subject to the same sources of contaminants and have substantially similar materials. Although the discharge material may be a carrier of contaminants, it is not likely to degrade the disposal site.

1.25 Evaluation and testing (Subpart G, 40 CFR 230.61)
Discussion: The proposed rock and sand material are not likely to be carriers of contaminants because they are naturally occurring inert material. Rock will be obtained from commercial upland source with no known contamination. The sand will come from maintenance dredging of the nearby GIWW and there is no known contamination occurring in this area.

1.26 Actions to minimize adverse impacts (Subpart H)
The following actions, as appropriate, have been taken through application of 40 CFR 230.70-230.77 to ensure no more than minimal adverse effects of the proposed discharge:

Table 10 – Actions to Minimize Adverse Effects	
Actions concerning the location of the discharge	X
Actions concerning the material to be discharged	X
Actions controlling the material after discharge	X
Actions affecting the method of dispersion	X
Actions related to technology	
Actions affecting plant and animal populations	X
Actions affecting human use	X
Other actions	

Discussion: The project area has been surveyed for aquatic vegetation and oysters and none occur within the bounds where breakwater construction will occur. Appropriate BMPs will be utilized to minimize any turbidity plumes resulting from the project. Construction equipment and material will access the site by traveling along the beach during low tide periods and mats will be used to minimize impacts. Shallow water

barges will also be used to bring in rock material The BMPs imposed at the project site will minimize any potential for the turbidity to spread farther than the targeted placement area (See Section 4.1 Public Notice Results). In addition, the project is a one-time operation and is short-term in nature.

1.27 Factual Determinations (Subpart B, 40 CFR 230.11)
The following determinations are made based on the applicable information above, including actions to minimize effects and consideration for contaminants:

Table 11 – Factual Determinations of Potential Effects

Site	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Major Effect
Physical substrate			X			
Water circulation, fluctuation and salinity			X			
Suspended particulates/turbidity			X			
Contaminants		X				
Aquatic ecosystem and organisms			X			
Proposed disposal site			X			
Cumulative effects on the aquatic ecosystem			X			
Secondary effects on the aquatic ecosystem			X			

Discussion: Temporary turbidity is probable during construction operations, resulting in minimal damage to fish and wildlife habitat and other biota; however, since the project is short-term in nature, will employ BMPs, the construction equipment will be located on upland areas, and breakwater material is composed of rock and concrete material that will be brought in by shallow water draft barges, impacts should be minimal. Sand from maintenance dredging of the nearby GIWW will be brought in by dredge-pipe. No lasting water pollution will occur.

1.28 Findings of compliance or non-compliance with the restrictions on discharges (40 CFR 230.10(a-d) and 230.12)
Based on the information above, including the factual determinations, the proposed discharge has been evaluated to determine whether any of the restrictions on discharge would occur:

Table 12 – Compliance with Restrictions on Discharge		
Subject	**Yes**	**No**
1. Is there a practicable alternative to the proposed discharge that would be less damaging to the environment (any alternative with less aquatic resource effects, or an alternative with more aquatic resource effects that avoids other significant adverse environmental consequences?)		X
2. Will the discharge cause or contribute to violations of any applicable water quality standards?		X
3. Will the discharge violate any toxic effluent standards (under Section 307 of the Clean Water Act)?		X
4. Will the discharge jeopardize the continued existence of endangered or threatened species or their critical habitat?		X
5. Will the discharge violate standards set by the Department of Commerce to protect marine sanctuaries?		X
6. Will the discharge cause or contribute to significant degradation of waters of the United States?		X
7. Have all appropriate and practicable steps (Subpart H, 40 CFR 230.70) been taken to minimize the potential adverse impacts of the discharge on the aquatic ecosystem?	X	

Discussion: The discharge will consist of clean rock rubble and sand that will not violate water quality standards or toxic effluent standards (See Section 1.3 and 6.1). Marine sanctuaries will not be affected by the planned discharge (See Section 9.2). The discharge will not jeopardize endangered or threatened species or their critical habitat (See Section 9.1). Water Quality was reviewed in Section 6.3 and 9.5. See Section 1.3 for minimization actions.

General Public Interest Review (33 CFR 320.4 and Regulatory Guidance Letter 84-09)

The decision whether to issue a permit will be based on an evaluation of the probable impacts, including cumulative impacts, of the proposed activity and its intended use on the public interest as stated at 33 CFR 320.4(a). To the extent appropriate, the public interest review below also includes consideration of additional policies as described in 33 CFR 320.4(b) through (r). The benefits which reasonably may be expected to accrue from the proposal are balanced against its reasonably foreseeable detriments.

1.29 Public interest factors review

All public interest factors have been reviewed and those that are relevant to the proposal are considered and discussed in additional detail:

Table 13 – Public Interest Factors						
Factor	**None**	**Detrimental**	**Neutral (mitigated)**	**Negligible**	**Beneficial**	**Not Applicable**
1. Conservation:					X	
2. Economics:				X		
3. Aesthetics:				X		
4. General Environmental Concerns:				X		
5. Wetlands:				X		
6. Historic Properties:	X					
7. Fish and Wildlife Values:				X		
8. Flood Hazards:	X					
9. Floodplain Values:						X
10. Land Use:				X		
11. Navigation:			X			
12. Shoreline Erosion and Accretion:					X	
13. Recreation:				X		
14. Water Supply and Conservation:						X
15. Water Quality:				X		
16. Energy Needs:						X
17. Safety:				X		
18. Food and Fiber Production:						X
19. Mineral Needs:						X
20. Consideration of Property Ownership:	X					
21. Needs and Welfare of the People:				X		

Additional discussion of effects on factors above:

None: The project area has been designed to avoid all wetlands and other special

aquatic sites. The installation of the structure would not reduce or create additional flood hazards in the vicinity of the project and would not have any impact on floodplain values. The project area is completely within the ANWR; therefore, there are no issues regarding Property Ownership.

Neutral (mitigated) Effects: To assure impacts to navigation are minimized, the authorization will be conditioned to require safety lights, signs and signals as required by U.S. Coast Guard.

Negligible Effects: The project would have a temporary negative effect during construction activities due to disturbances to the surrounding environment in the forms of added turbidity in the water column, added human presence, and noise higher than ambient levels. All of these effects would return to normal levels once the project is complete and construction activities have ceased. The project will also not change the current baseline in such a way that the public interests in this area will suffer detrimental effects.

Beneficial Effects: The project will have a beneficial effect on the shoreline erosion rate and habitat areas as it will protect the existing shoreline by reducing wave energy and the resulting erosion, which will also preserve the remaining estuarine marsh and coastal bluff habitats.

Historic Properties Factor: See Section 1.43.2 of this document for information regarding how the Corps has determined that it has fulfilled its responsibilities under Section 106 of the NHPA.

1.30 Public and private need
The relative extent of the public and private need for the proposed structure or work:

See Section 3.0 of this document for discussion on the need for this project.

1.31 Resource use unresolved conflicts
If there are unresolved conflicts as to resource use, explain how the practicability of using reasonable alternative locations and methods to accomplish the objective of the proposed structure or work was considered.

There were no unresolved conflicts identified as to resource use.

1.32 Beneficial and/or detrimental effects on the public and private use
The extent and permanence of the beneficial and/or detrimental effects that the proposed work is likely to have on the public and private use to which the area is suited is described below:

Detrimental effects are expected to be minimal and temporary. (See Section 7.1)

Beneficial effects are expected to be minimal and temporary. (See Section 7.1)

The public use of the area in the vicinity of the proposed structure would not change from current use as access to recreational features in this area will remain open. Permanent beneficial effects would occur based on the reduced erosion that would allow habitat areas to stabilize and be colonized by wetland plant species, SAV, and/or oysters. In addition, recreational infrastructure will be protected by stabilizing shoreline erosion.

1.33 Climate Change

The proposed activities within the Corps' federal control and responsibility likely will result in a negligible release of greenhouse gases into the atmosphere when compared to global greenhouse gas emissions. Greenhouse gas emissions have been shown to contribute to climate change. Aquatic resources can be sources and/or sinks of greenhouse gases. For instance, some aquatic resources sequester carbon dioxide whereas others release methane; therefore, authorized impacts to aquatic resources can result in either an increase or decrease in atmospheric greenhouse gas. These impacts are considered de minimis. Greenhouse gas emissions associated with the Corps' federal action may also occur from the combustion of fossil fuels associated with the operation of construction equipment, increases in traffic, etc. The Corps has no authority to regulate emissions that result from the combustion of fossil fuels. These are subject to federal regulations under the Clean Air Act and/or the Corporate Average Fuel Economy (CAFE) Program. Greenhouse gas emissions from the Corps' action have been weighed against national goals of energy independence, national security, and economic development and determined not contrary to the public interest.

Mitigation

(33 CFR 320.4(r), 33 CFR Part 332, 40 CFR 230.70-77, and 40 CFR 1508)

1.34 Avoidance and minimization

Avoidance and Minimization: When evaluating a proposal including regulated activities in waters of the United States, consideration must be given to avoiding and minimizing effects to those waters. Avoidance and minimization are described in Section 1.3.1 above.

Describe other mitigative actions including project modifications implemented to minimize adverse project impacts? (See 33 CFR 320.4(r)(1)(i))

The design of the structures is intended to minimize the impacts to WOTUS by having a minimum footprint and elevation while providing a reasonable degree of shoreline and habitat protection. The location of the proposed breakwater structure and the high bluff toe protection structures was also selected to minimize impacts to critical areas and WOUS by placement at the 2-foot bathymetric contour to minimize the size of structure needed while avoiding identified oyster reefs and submerged aquatic vegetation. The placement offshore is also intended to avoid and protect existing areas of emergent marsh habitat present along the current shoreline. Other than the direct footprint of the structure, it will minimize shading of surrounding areas. The proposed structures will be constructed with materials that will not cause any adverse effects to coastal waters.

1.35 Compensatory mitigation requirement
Is compensatory mitigation required to offset environmental losses resulting from proposed unavoidable impacts to waters of the United States? No

Provide rationale: No mitigation is required because the activity consists of construction of a structure that would not adversely impact aquatic resources and would not result in loss of special aquatic sites. The placement of the offshore breakwater will protect existing areas of emergent marsh habitat present along the current shoreline and coastal bluff habitats in the Blackjack Unit of the ANWR. The reduction in wave energy and erosion will allow for the protected habitats to expand in aerial extent.

Consideration of Cumulative Effects
(40 CFR 1508 & RGL 84-9) Cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor direct and indirect but collectively significant actions taking place over a period of time. A cumulative effects assessment should consider how the direct and indirect environmental effects caused by the proposed activity requiring DA authorization (i.e., the incremental impact of the action) contribute to the aggregate effects of past, present, and reasonably foreseeable future actions, and whether that incremental contribution is significant or not.

1.36 Identify/describe the direct and indirect effects which are caused by the proposed activity: The direct effects associated with the proposed project are the maximum placement of approximately 311,000 cy of rock stabilization material for a five-mile segmented offshore breakwater and 11,00 cubic yards of sand fill material for bluff toe protection. Total filled area for the project will be approximately 30 to 40 acres of unvegetated bay bottom below the AHTL of San Antonio Bay. The low elevation breakwaters would have minimal visibility in the offshore bay waters and would have a negligible permanent effect on aesthetics.

The indirect effects associated with the proposed project are disturbances to the surrounding environment during construction in the forms of temporary adverse impact upon the aesthetics, added turbidity in the water column, added human presence, and noise higher than ambient levels. These effects would be short-term in nature and will return to normal levels once the project is complete and construction activities have ceased.

1.37 The geographic scope for the cumulative effects assessment is:approximately 30 to 40 acres of unvegetated nearshore waters along the eastern shoreline of the Aransas National Wildlife Refuge (ANWR) in its Blackjack Unit in the southwestern area of San Antonio Bay.

1.38 The temporal scope of this assessment covers:
A review of the Corps' regulatory database for the watershed spanning the past five years was performed. Similarly, the Corps analysis will estimate future impacts for the next five years.

1.39 Describe the affected environment: The project is located in an area that consists mostly of the ANWR and is largely undeveloped and unpopulated. The project and its effects will be limited to a small portion of the West San Antonio Bay watershed (Hydrologic Unit Code (HUC) 12100404). Approximately 44% of the watershed is open water, 32% of the watershed is wetland, 9% is pastureland and 1.1% is developed open space, according to a review of GIS data in the Corps ORM database. The West San Antonio Bay watershed covers portions of Aransas and Refugio Counties. The primary rivers in the watershed drain into the San Antonio Bay.

1.40 Determine the environmental consequences:

Past and present actions, outside the Corps jurisdiction, that have been constructed include infrastructure, commercial and residential developments, parks and recreational areas, and industrial areas. While these actions did not require a Corps permit, they did require City and/or County approval prior to construction.

Past and present actions, within the Corps jurisdiction, that have been authorized for impacts within the scope of this assessment were analyzed by a review of the Corps regulatory database. It is important to note that not every action that was authorized has resulted in a loss of Waters of the US. Many permits are authorized and not constructed for a variety of reasons. Nevertheless, a review of authorized activities does provide some indication of potential stressors, and potential impacts, on the environment. The aggregated effect of past actions resulted in the authorization to impact approximately 0.13 acre of waters of the US. These permitted impacts did not require compensatory mitigation.

Through evaluation of the proposed action's impacts navigation, aesthetics, shoreline erosion, and recreation, impact reduction through avoidance and minimization efforts, it was determined that on a long-term and/or cumulative basis, project authorization would not substantially adversely impact the aquatic environment and therefore would not be contrary to the overall public interest.

1.41 Conclusions regarding cumulative impacts: When considering the direct and indirect impacts that will result from the proposed activity, in relation to the overall direct and indirect impacts from past, present, and reasonably foreseeable future activities, the incremental contribution of the proposed activity to cumulative impacts in the area described in section 9.2, are not significant . Compensatory mitigation will not be required to offset the impacts of the proposed activity to eliminate or minimize its incremental contribution to cumulative effects within the geographic area described in Section 9.2. Mitigation required for the proposed activity is discussed in Section 1.35.

Compliance with Other Laws, Policies and Requirements

1.42 Section 7(a)(2) of the Endangered Species Act (ESA)

Refer to Section 2.2 for description of the Corps' action area for Section 7 of the ESA.

1.42.1 Lead federal agency for Section 7 of the ESA: Has another federal agency been identified as the lead agency for complying with Section 7 of the ESA with the Corps designated as a cooperating agency and has that consultation been completed? Yes

Identify the lead agency, the actions taken to document compliance with Section 7 of the ESA and whether those actions are sufficient to ensure the activity(s) requiring Department of the Army authorization is in compliance with Section 7 of the ESA:
The FWS is the lead agency for evaluating Section 7 of the ESA. The FWS has conducted intra-service consultation to demonstrate compliance with Section 7 of the ESA. The Corps has received and reviewed the documentation from the intra-service consultation, which is incorporated by reference in this document.
The Corps has reviewed the documentation provided by the agency and determined it is sufficient to confirm Section 7 ESA compliance for this permit authorization, and additional consultation is not necessary.

1.42.2 Listed/proposed species and/or designated/proposed critical habitat
Are there listed or proposed species and/or designated critical habitat or proposed critical habitat that may be present or in the vicinity of the Corps' action area? Yes

Effect determination(s), including no effect, for all known species/habitat, and basis for determination(s): The FWS made determinations of no effect for Attwater's prairie chicken, northern aplomado falcon, black lace cactus, monarch butterflies, and nesting sea turtles (green sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, and loggerhead sea turtle).

The FWS made determinations of may effect, but is not likely to adversely affect for the piping plover, red knot, eastern black rail, whooping crane, West Indian manatee, which included consideration for effects of the regulated activities proposed in waters of the US requiring authorization from the Corps and within the actions area as described above. The FWS concluded the intra-service consultation on 12 April 2022, concurring with the determinations.

The FWS also made determination of may effect, but is not likely to adversely affect for the giant manta ray and swimming sea turtles or their critical habitat. The NMFS concurred with FWS' determination by letter dated 7 September 2022.

1.42.3 Section 7 ESA consultation
Consultation with either the National Marine Fisheries Service and/or the United States Fish and Wildlife Service was initiated and completed as required, for any determinations other than "no effect" (see the attached ORM2 Summary sheet for begin date, end date and closure method of the consultation)

1.43 Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), Essential Fish Habitat (EFH)

1.43.1 Lead federal agency for EFH provisions of the Magnuson-Stevens Act
Has another federal agency been identified as the lead agency for complying with the EFH provisions of the Magnuson-Stevens Act with the Corps designated as a cooperating agency and has that consultation been completed? Yes

Identify the agency, the actions taken to document compliance with the Magnuson-Stevens Act and whether those actions are sufficient to ensure the activity(s) requiring Department of the Army authorization is in compliance the EFH provisions.

The FWS (applicant) is the lead agency responsible for evaluating EFH. The applicant incorporated faunal passages in the breakwater design. The applicant determined that the project would not have a substantial adverse effect on federally managed fishery species, seagrass or essential fish habitat, including red drum, brown, white, and pink shrimp, highly migratory shark species, reef fish, and some nearshore pelagic fish that may use San Antonio Bay. This design element is shown in detail on the project plans and NMFS – HCD concurrence that any adverse effects, which might occur to marine fishery resources and essential fish habitat would be minimal as documented in their email to the applicant dated 14 June 2022. See administrative record.

The Corps has reviewed the documentation provided by the agency and determined it is sufficient to confirm compliance for this permit authorization with the EFH provisions, and additional consultation is not necessary.

1.43.2 Magnuson-Stevens Act
Did the proposed project require review under the Magnuson-Stevens Act? Yes

The District Engineer determined the proposed activity may adversely affect EFH and thus required EFH consultation with NMFS.

1.43.3 EFH species or complexes
Were EFH species or complexes considered? Yes, the following is a summary of the type of species listed in the Gulf of Mexico Fishery Management Plans: red drum, triggerfishes (Balistidae), jacks (Carangidae), wrasses (Labridae), snappers (Lutjanidae), tilefishes (Malacanthidae), groupers (Serranidae), and coastal migratory pelagic species, shrimps, stone crabs, and spiny lobsters.

Effect determination and basis for that determination: Minimal adverse effect. Effects to fish habitat are temporary and minimal. Baseline habitat conditions are expected to return once the project is complete.

1.43.4 National Marine Fisheries Service consultation
Consultation with the National Marine Fisheries Service was initiated and completed as required (see the attached ORM2 Summary sheet for begin date, end date and closure method of the consultation)

1.44 Section 106 of the NHPA
Refer to Section 2.3 for permit area determination.

1.44.1 Lead federal agency for Section 106 of the NHPA
Has another federal agency been identified as the lead federal agency for complying with Section 106 of the NHPA with the Corps designated as a cooperating agency and has that consultation been completed? Yes

Identify the lead agency, and whether the undertaking they consulted on included the Corps' undertaking(s). Briefly summarize actions taken by the lead federal agency.

The U.S. Fish and Wildlife Service is the lead federal agency for this project and will need to provide the U.S Army Corps of Engineers with copies of any Tribal consultation that is conducted along with any and all responses that were received.

The applicant discussed their compliance with Section 106 of the NHPA in the Cultural Resource Evaluation documents found in Attachment D of the application (extracted and provided to staff archeologist). The applicant received SHPO concurrence in an email dated 9 April 2024. The Corps staff archaeologist confirmed the concurrence by email dated 11 April 2024 (See Administrative Record).

The Corps has reviewed the documentation provided by the agency and determined it is sufficient to confirm Section 106 compliance for this permit authorization, and additional consultation is not necessary.

1.44.2 Historic properties
Known historic properties present? No, the applicant conducted a marine cultural resource assessment survey for the project area in 2020-2021. One hundred thirty-four magnetic anomalies or anomaly clusters, 13 acoustic contacts, and three acoustic reflectors were detected in the remote sensing record. Three magnetic anomalies were identified as potential submerged cultural resources. Although these three areas are not within the breakwater footprint, they may be in the vicinity of the construction corridor. The applicant coordinated its survey results with the Texas Historical Commission (THC) on the three areas and the THC concurred with the applicant's findings as noted in its email dated 9 April 2024.

The Corps staff archaeologist reviewed the project site for cultural resources and found that there are no previously recorded historic properties known to exist within the proposed permit area.

Effect determination and basis for that determination: No adverse effect

1.44.3 Consultation with the appropriate agencies, tribes and/or other parties for effect determinations

The USFWS is the lead federal agency for this project and has completed all Section 106 consultation. The Corps staff archaeologist confirmed this by email dated 11 April 2024 (See Administrative Record).

The Corps' Tribal Liaison officer reviewed the project and stated that the project is within the area of interest for the following Tribes: the Apache Tribe of OK, the Comanche Nation, the Kiowa Indian Tribe of OK, the Mescalero Apache Tribe, the Northern Arapaho Tribe, the Tonkawa Tribe of OK, and the Wichita and Affiliated Tribes. The U.S. Fish and Wildlife Service is the lead federal agency for this project and will need to provide the U.S Army Corps of Engineers copies of any Tribal consultation along with all responses.

1.45 Tribal Trust Responsibilities

Tribal government-to-government consultation
Was government-to-government consultation conducted with federally-recognized tribe(s)? Yes

Provide a description of any consultation(s) conducted including results and how concerns were addressed.

The FWS is the lead federal agency or this project and has completed all Tribal consultation. The Corps staff archaeologist confirmed this by email dated 11 April 2024 (See Administrative Record).

1.45.1 Other Tribal consultation
Other Tribal consultation including any discussion of Tribal Treaty rights. N/A

1.46 Section 401 of the Clean Water Act – Water Quality Certification (WQC)

1.46.1 Section 401 WQC requirement
Is an individual Section 401 WQC required, and if so, has the certification been issued or waived? An individual WQC is required and has been granted.

The TCEQ granted a 401 Certification without special conditions on 2 August 2022.

1.46.2 401(a)(2) Process
If the certifying authority granted an individual WQC, did the United States Environmental Protection Agency make a determination that the discharge 'may affect' water quality in a neighboring jurisdiction? No, the EPA submitted an electronic mail message on 29 September 2022 stating it had decided to not make a "may affect" determination on the water quality of neighboring jurisdictions.

1.47 Coastal Zone Management Act (CZMA)

1.47.1 CZMA consistency concurrence

Is a CZMA consistency concurrence required, and if so, has the concurrence been issued, objected to, or presumed? An individual CZMA consistency concurrence is required and has been issued by the appropriate agency.

The applicant has stated that the proposed activity complies with Texas' approved Coastal Management Program (CMP) and will be conducted in a manner consistent with such program. The GLO/Texas Coastal Coordination Council (CCC) submitted a letter, 5 July 2022, stating that it has been determined that there are no significant unresolved consistency issues with respect to the project. The TCEQ submitted a electronic mail message, 2 August 2022, stating that it has been determined that the proposed action is consistent with the applicable CMP goals and policies, therefore the project is consistent with the CMP goals and policies.

1.48 Wild and Scenic Rivers Act

1.48.1 National Wild and Scenic River System
Is the project located in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system? No

1.49 Effects on Corps Civil Works Projects (33 USC 408)

1.49.1 Permission requirements under Section 14 of the Rivers and Harbors Act (33 USC 408)
Does the applicant also require permission under Section 14 of the Rivers and Harbors Act (33 USC 408) because the activity, in whole or in part, would alter, occupy, or use a Corps Civil Works project?

No, the appropriate non-Regulatory office has determined that there will be no effects to federal projects that require permission from the Corps.

1.50 Corps Wetland Policy (33 CFR 320.4(b))

1.50.1 Wetland Impacts
Does the project propose to impact wetlands? No

1.51 Other (as needed) N/A

1.52 Compliance Statement
The Corps has determined that it has fulfilled its responsibilities under the following laws, regulations, policies, and guidance:

Table 14 – Compliance with Federal Laws and Responsibilities		
Laws, Regulations, Policies, and Guidance	**Yes**	**N/A**
Section 7(a)(2) of the ESA	X	
EFH provisions of the Magnuson-Stevens Act	X	
Section 106 of the NHPA	X	

Tribal Trust	X	
Section 401 of the Clean Water Act	X	
CZMA	X	
Wild and Scenic Rivers Act		X
Section 408 - 33 USC 408	X	
Corps Wetland Policy (33 CFR 320.4(b))	X	
Other:		X

Special Conditions

1.53 Special condition(s) requirement(s)

Are special conditions required to ensure minimal effects, ensure the authorized activity is not contrary to the public interest and/or ensure compliance of the activity with any of the laws above? Yes

If 'No', provide rationale: N/A

1.54 Required special condition(s)

Special Condition 1: The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

Special Condition 2: When structures or work authorized by this permit are determined by the District Engineer to have become abandoned, obstructive to navigation or cease to be used for the purpose for which they were permitted, such structures or other work must be removed, the area cleared of all obstructions, and written notice given to the Corps of Engineers, Galveston District, Regulatory Division, within 30 days of completion.

Special Condition 3: The permittee must install and maintain, at the permittee's expense, any safety lights, signs and signals required by US Coast Guard, through regulations or otherwise, on the permittee's fixed structures. To receive a US Coast Guard Private Aids to Navigation marking determination, at no later than 30 days prior to installation of any fixed structures in navigable waters and/or prior to installation of any floating private aids to navigation, you are required to contact the Eighth Coast Guard District (dpw), 500 Poydras St. Suite 1230, New Orleans, LA 70130, (504) 671-2328 or via email to: D8oanPATON@uscg.mil. For general information related to Private Aids to Navigation please visit the Eighth Coast Guard District web site at: https://www.atlanticarea.uscg.mil/District-8/District-Divisions/Waterways/PATON/

Rationale: In accordance with 33 CFR 325.4 Conditioning of permits, the district engineer will add special conditions to Department of Army permits when such conditions are necessary to satisfy legal requirements or to otherwise satisfy the public

interest requirements. The above special conditions are required for fulfillment of the public interest requirements specified according to 33 CFR 320.4(o)(3) Navigation and 33 CFR 320.4(g) Consideration of property ownership.

Findings and Determinations

1.55 Section 176(c) of the Clean Air Act General Conformity Rule Review:
The proposed permit action has been analyzed for conformity applicability pursuant to regulations implementing Section 176(c) of the Clean Air Act. It has been determined that the activities proposed under this permit will not exceed *de minimis* levels of direct or indirect emissions of a criteria pollutant or its precursors and are exempted by 40 CFR Part 93.153. Any later indirect emissions are generally not within the Corps' continuing program responsibility and generally cannot be practicably controlled by the Corps. For these reasons a conformity determination is not required for this permit action.

1.56 Presidential Executive Orders (EO)

1.56.1 EO 11988, Floodplain Management
This action is not located in a floodplain.

1.56.2 EO 12898 and EO 14008, Environmental Justice

Provide details regarding screening and mapping tools and available information utilized during the review.

The Council on Environmental Quality-Climate and Economic Justice Screening Tool shows the census tract for the project area as being disadvantaged. Supporting information was derived from the EPA's EJ Screen and the EJ Dashboard sites.

Have disadvantaged communities been identified within the vicinity of the proposed project? Yes

The project area is located in a census tract (Tract 48007950100) that does indicate presence of disadvantage communities due to climate change, energy, health, and legacy pollution.

What meaningful involvement efforts did the Corps take for potentially affected disadvantaged communities and other interested individuals, communities, and organizations?

The Corps engaged in meaningful involvement efforts for potentially affected disadvantaged communities, other interested individuals, communities, and organizations by publishing a Public Notice to resource agencies, the general public, and adjacent property owners. The Corps contacted local, federal, and state governmental entities, non-governmental organizations and other entities who have requested that they be added to the public notice. Information gathered during the coordination notice is used in the evaluation of the permit application and to render a

decision on the final disposition of the application. During the notice period the Corps did not receive any comments regarding environmental justice. See administrative record for additional details.

Describe if resource impacts are high and adverse.

Both direct and indirect impacts to aquatic species are anticipated from the proposed action since the 210-acre project construction area of the proposed action will occur in coastal areas of ANWR. Direct impacts include disturbance and direct mortality of vegetation and less mobile wildlife species from construction activities. Identified SAV beds and oyster reefs will be avoided during construction, but the risk of incidental impacts during construction will be present. As construction progresses along the 5-mile project length, most wildlife should be able to disperse into surrounding areas.

The project will fill 47.5 acres of shallow water habitat and will have negligible impacts as noted in Tables 6 and 7. The project may indirectly create 47.5 acres of oyster and other bivalve habitat and secondary productivity with the installation of the breakwater. The project also has the potential to create and restore submerged aquatic vegetation habitat due to sand accretion on the backside of the breakwaters and calmer water conditions. There are no direct, indirect, or cumulative impacts to cultural, economic, social, or health.
.
Do the impacts fall disproportionately on disadvantaged communities? No, the project site is located within a national wildlife refuge that is remote from any communities.

Based upon the discussion and analysis in the preceding sections, the Corps has determined that portions of the proposed project within our federal control and responsibility would not have a disproportionately high and adverse human health or environmental effect on disadvantaged communities.

1.56.3 EO 13112, Invasive Species, as amended by EO 13751
There are no invasive species issues involved in this proposed project.

1.56.4 EO 13212 and EO 13302, Energy Supply and Availability
The proposal is not one that will increase the production, transmission, or conservation of energy, or strengthen pipeline safety.

1.57 Findings of No Significant Impact
Having reviewed the information provided by the applicant and all interested parties and an assessment of the environmental impacts, I find that this permit action will not have a significant impact on the quality of the human environment. Therefore, an environmental impact statement will not be required.

1.58 Compliance with the Section 404(b)(1) Guidelines
The proposed discharge complies with the Guidelines.

1.59 Public interest determination

Having reviewed and considered the information above, I find that the proposed project is not contrary to the public interest. The permit will be issued with appropriate conditions included to ensure minimal effects, ensure the authorized activity is not contrary to the public interest and/or ensure compliance of the activity with any of the authorities identified in Section 10.

PREPARED BY:

Mark Pattillo

Date: 26 June 2024

Mark Pattillo
Regulatory Project Manager

REVIEWED/APPROVED BY:

WOOD.KRISTIE.AN
N.1365494645

Digitally signed by WOOD.KRISTIE.ANN.1365494645
Date: 2024.06.27 10:10:31 -05'00'

Date:

Kristie Wood
Supervisor, Corpus Christi Regulatory Field Office
Regulatory Division, Galveston District

Department of the Army Standard Individual Permit Decision – ORM2 Decision Summary Data for SWG-2018-00279-RCC – Aransas National Wildlife Refuge/SP/San Antonio Bay/Aransas Co.

Date Generated: 26-JUN-2024

Permit ID(s): 11704029

Applicant Info:

Contact ID	Applicant
10910851	USFWS Aransas National Wildlife Refuge

Location Latitude/Longitude: 28.278506, -96.80063

Authorized Project Description (from the permit action)

Description	Permit IDs
Construct a shoreline protection and bluff stabilization project for the eroding shoreline of the Aransas NationalWildlife Refuge (ANWR) along San Antonio Bay, particularly along Dagger Point. Project would include a continuous breakwater (BW) around Dagger Point and a series of segmented rock BWs on the northern and southern alignments parallel and offshore of the existing shoreline and provide toe protection to the eroding bluffs. A low-crested rubble-mound (rock) structure is proposed for the BWs and as toe protection for the high bluff areas. The proposed design of the BW structures includes a max. crest elevation between +3.0 to +4.0 feet (ft) North American Vertical Datum of 1988 (NAVD88) with a crest width of 10 ft. The bayward face of the BW would have a slope of 1-ft vertical drop for every 5 ft of horizontal run (5H:1V) with the landward slope of 3H:1V. Approx. 4,200 ft of armored toe protection will be constructed at the base of the high bluffs including a series of near shore BWs and groins with sand fill constructed along a 1,300 ft section of high bluffs at Dagger Point. Sand of similar grain size and mineralogy to native sediment will be obtained from either a commercial source or from material dredged from the GIWW. Low bluffs will be regraded to reduce the angle of the slope and then planted with vegetation.	11704029

Closure Method

Permit Begin Date	Permit End Date	Closure Method	Permit IDs
03-DEC-2021		Issued With Special Conditions	11704029

After-the-fact (ATF)?

ATF	Permit IDs
No	11704029

Purpose:

Purpose	Permit IDs
The purpose is to protect the existing shoreline by reducing wave energy and erosion to preserve the remaining estuarine marsh and coastal bluff habitats. Additionally, public infrastructure such as access roads, parking areas, and viewing piers would be protected from continued erosion and wave impacts.	11704029

Jurisdictional Determination(s) (JDs)
No Data Found

Permit Authority

Permit Authority	Permit IDs
Section 10/404	11704029

Permit Type, Permit Name and Number (PNN)

Permit Type	PNN	Permit IDs
SP	N/A	11704029

Date Determined Complete for Processing

Date Processing Complete	Permit IDs
17-MAY-2022	11704029

Public Notice Date

Permit ID	PN ID	Date of Public Notice
11704029	11704032	19-MAY-2022

Worktypes

Worktype	Permit IDs
\ OTHER \ BANK STABILIZATION	11704029
\ STRUCTURE \ BREAKWATER	11704029

Impact(s) including Impact Activity Types (IAT), Units of Measure (UOM) and Amounts

Permit ID	Perm Loss	Cowardin Class	IAT	Initially Proposed	Proposed	Authorized
11704029	No	E1UB-ESTUARINE, SUBTIDAL UNCONSOLIDATED BOTTM	Fill Area	(L) (W) (A) 42 Acre	(L) (W) (A) 42 Acre	(L) (W) (A) 42 Acre
11704029	No	E2US-ESTUARINE, INTERTIDAL, UNCONSOL SHORE	Fill Area	(L) (W) (A) 3 Acre	(L) (W) (A) 3 Acre	(L) (W) (A) 3 Acre
11704029	Yes	E2US-ESTUARINE, INTERTIDAL, UNCONSOL SHORE	Fill Area	(L) (W) (A) 4.5 Acre	(L) (W) (A) 4.5 Acre	(L) (W) (A) 4.5 Acre

Aquatic Resource(s) associated with Impact(s)

Waters Name	Waters Type	Cowardin Class	Waterway	Latitude/Longitude	Permit IDs

18-0279/ FWS/ SA Bay/ Eros Cntrl/ ARA	Delineation Only - PJD or No JD Required	E1UB-ESTUARINE, SUBTIDAL UNCONSOLIDATED BOTTM	San Antonio Bay	28.275528, -96.797853	11704029
18-0279/ FWS/ SA Bay/ Shoreline Stblz/ ARA	No JD Required - Section 10/404	E2US-ESTUARINE, INTERTIDAL, UNCONSOL SHORE	San Antonio Bay	28.275572, -96.797968	11704029, 11704029

Internal Coordination

Permit ID	SubAction ID	Permit Start Date	Permit End Date
11704029	11836429	26-APR-2022	02-MAY-2022

Compensatory Mitigation Required (CMR)? Permittee Responsible Mitigation (PRM)?

CMR?	PRM?	Permit IDs
No	None	11704029

Mitigation including Type, Units of Measure (UOM) and Amounts

No Data Found

Advanced Permittee Responsible Credits

No Data Found

Aquatic Resource(s) associated with Mitigation

No Data Found

Evaluation Checklist Responses for:

Endangered Species Act (ESA)

Type	Decision	Permit IDs
ESA Coordination	Resources Present/Consultation Required	11704029

Essential Fish Habitat (EFH)

Type	Decision	Permit IDs
EFH Coordination	Resources Present/Consultation Required	11704029

Section 106 of the NHPA

Type	Decision	Permit IDs
Section 106 of the NHPA	Coordination/Consultation Required	11704029

Tribal Consultation(s)

Type	Decision	Permit IDs
Tribal Coordination/Consultation	Required	11704029

Wild & Scenic River

Type	Decision	Permit IDs
Wild & Scenic River	No Resources Present	11704029

Water Quality Certification (WQC)

Type	Decision	Permit IDs
Individual WQC	Required	11704029

Coastal Zone Management Consistency Concurrence (CZM)

Type	Decision	Permit IDs
CZM	Required	11704029

Recapture Provision

Type	Decision	Permit IDs
Recapture Provision	Does Not Apply	11704029

Subactions Added:

ESA Consultation(s)

Type	ESA Begin Date	ESA End Date	Species	Closure Method	Permit IDs
ESA	06-DEC-2021	26-APR-2022	Crane, Whooping (Grus americana), Knot, Rufa Red (Calidris canutus rufa), Manatee, West Indian (Trichechus manatus), Plover, Piping (Charadrius melodus), Rail, Eastern Black (Laterallus jamaicensis ssp. jamaicensis)	Not Likely To Adversely Affect	11704029
ESA	31-AUG-2022	07-SEP-2022	Ray, Giant Manta (Manta birostris), Sawfish, Smalltooth (Pristis pectinata), Sea Turtle, Green (Chelonia mydas), Sea Turtle, Green (Chelonia mydas), Sea Turtle, Hawksbill (Eretmochelys imbricata), Sea Turtle, Kemp's Ridley (Lepidochelys kempii), Sea Turtle, Loggerhead (Caretta caretta)	Activity Covered by a Programmatic Consultation	11704029

EFH Consultation(s)

Type	EFH Begin Date	EFH End Date	Closure Method	Permit IDs

EFH	19-MAY-2022	05-JAN-2023	No Adverse Effect	11704029

Section 106 of the NHPA Consultation(s)

Type	106 Begin Date	106 End Date	Closure Method	Permit IDs
SECT106	03-DEC-2021	11-APR-2024	Process Complete	11704029

Tribal Consultation(s)

No Data Found

Water Quality Certification (WQC) Consultation(s)

Action by CA	Closure Method	End Date	Permit IDs
Granted with Conditions	Procedure Complete	29-SEP-2022	11704029

Coastal Zone Management Act(s)

Type	CZM Begin Date	CZM End Date	Agency Notified	Closure Method	Identification Numbers
CZM	19-MAY-2022	05-JUL-2022	State Agency	CZM Agency Concurrence Or Presumed Concurrence	

408 Review Required?

Section 408	Permit IDs
No	11704029

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, GALVESTON DISTRICT
5151 FLYNN PARKWAY, SUITE 306
CORPUS CHRISTI, TEXAS 78411

July 3, 2024

Corpus Christi Regulatory Field Office

SUBJECT: Permit Application – SWG-2018-00279

U.S. Fish & Wildlife Service
Attn: Mr. Jose Saenz, Refuge Mgr.
P.O. Box 100
Austwell, Texas 77950

Dear Mr. Saenz:

The above numbered permit has been approved and a signed copy is enclosed for your retention.

Also enclosed is a copy of "Notice to Permittee" which provides important information for permit administration. You should notify the District Engineer, in writing, upon completion of the authorized work. To assist us in improving our service to you, please complete the survey found at: https://regulatory.ops.usace.army.mil/customer-service-survey/.

Sincerely,

Robert W. Heinly

Kristie A. Wood
Supervisor
Corpus Christi Regulatory Field Office

cc w/Encl.
Ms. Renee Robertson, Anchor QEA, LLC

EPA Kaspar.paul@epa.gov; martinez.maria@epa.gov

Texas Commission on Environmental Quality (TCEQ) 401Certs@tceq.texas.gov

United States Coast Guard (USCG) d8dpball@uscg.mil

National Ocean Service (NOAA) ocs.ndb@noaa.gov

DEPARTMENT OF THE ARMY PERMIT

Permittee Aransas National Wildlife Refuge

Permit No. SWG-2018-00279

Issuing Office Galveston District

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description: To construct a shoreline protection and bluff stabilization project for the eroding shoreline of the Aransas National Wildlife Refuge (ANWR) along San Antonio Bay, particularly along Dagger Point. The project includes a continuous breakwater (BW) around Dagger Point, a five-mile series of segmented rock BWs on the northern and southern alignments parallel and offshore of the existing shoreline, and armored toe protection to the eroding high bluffs along the Dagger Point shoreline. A low-crested rubble-mound (rock) structure will be installed for the BWs and as toe protection for the high bluff areas. The BW structures include a maximum crest elevation between +3.0 to +4.0 feet (ft) North American Vertical Datum of 1988 (NAVD88) with a crest width of 10 ft. The bay ward face of the BW will have a slope of 1-ft vertical drop for every 5 feet of horizontal run (5H:1V) with the landward slope of 3H:1V. Approximately 4,200 feet of armored toe protection will be constructed at the base of the high bluffs, including a series of near shore BWs and groins with sand fill constructed along a 1,300-foot section of high bluffs at Dagger Point. Approximately 11,000 cubic yards of sand material of similar grain size and mineralogy to native sediment will be obtained from a commercial upland source. The sand will meet the USACE requirements outlined in 404(b)(1) guidelines and the Inland Testing Manual as appropriate. Low bluffs will be regraded to reduce the angle of the slope and then planted with vegetation.

The project will be conducted in accordance with the attached plans, in 16 sheets.

Project Location: On San Antonio Bay along the eastern shoreline of the ANWR in its Blackjack Unit. The site is approximately eight miles south southeast of Austwell, in Aransas County, Texas. Latitude: 28.278507 Longitude: -96.800632

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on 31 December 2029. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

Special Condition 1: The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

Special Condition 2: When structures or work authorized by this permit are determined by the District Engineer to have become abandoned, obstructive to navigation or cease to be used for the purpose for which they were permitted, such structures or other work must be removed, the area cleared of all obstructions, and written notice given to the Corps of Engineers, Galveston District, Regulatory Division, within 30 days of completion.

Special Condition 3: The permittee must install and maintain, at the permittee's expense, any safety lights, signs and signals required by US Coast Guard, through regulations or otherwise, on the permittee's fixed structures. To receive a US Coast Guard Private Aids to Navigation marking determination, at no later than 30 days prior to installation of any fixed structures in navigable waters and/or prior to installation of any floating private aids to navigation, you are required to contact the Eighth Coast Guard District (dpw), 500 Poydras St. Suite 1230, New Orleans, LA 70130, (504) 671-2328 or via email to: D8oanPATON@uscg.mil. For general information related to Private Aids to Navigation please visit the Eighth Coast Guard District web site at: https://www.atlanticarea.uscg.mil/District-8/District-Divisions/Waterways/PATON/

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

(X) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(X) Section 404 of the Clean Water Act (33 U.S.C. 1344).

( ) Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

JOSE SAENZ Digitally signed by JOSE SAENZ Date: 2024.07.02 10:12:33 -05'00'

(PERMITTEE) *(DATE)*

JOSE SAENZ, REFUGE MANAGER
ARANSAS NATIONAL WILDIFE REFUGE
US FISH AND WILDLIFE SERVICE

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

Robert W. Heinly

(DISTRICT ENGINEER) *(DATE)*

KRISTIE A. WOOD, SUPERVISOR
CORPUS CHRISTI REGULATORY FIELD OFFICE
FOR COLONEL RHETT A. BLACKMON, P.E.

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

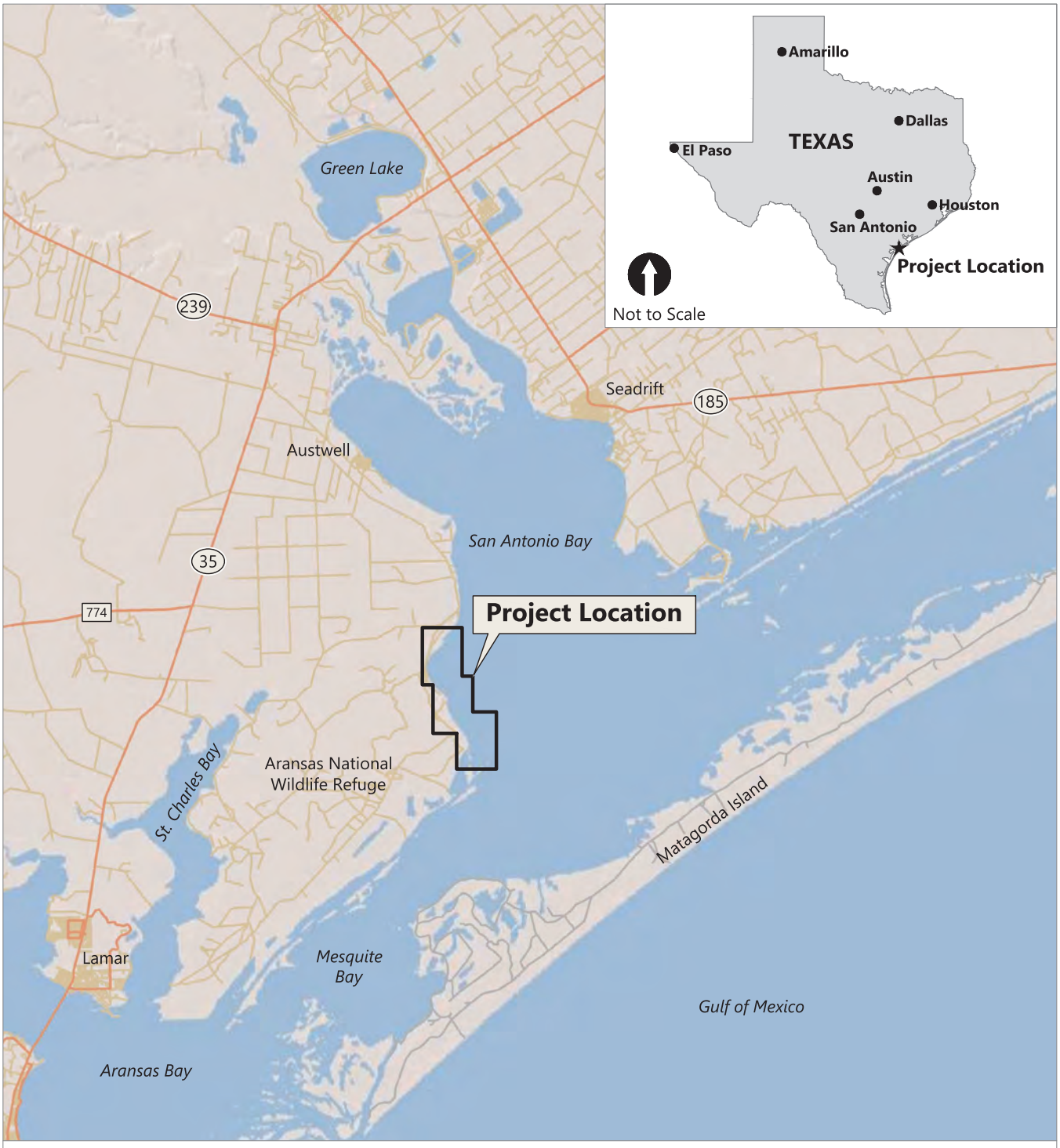
(TRANSFEREE – Typed/Printed Name) *(DATE)*

(TRANSFEREE - Signature) (*Mailing Address)*

(REVERSE OF ENG FORM 1721)

PERMITTED PLANS

SWG-2018-00279



SOURCE: Basemap ©2014 Esri
HORIZONTAL DATUM: Texas State Plane South Central, North American Datum of 1983 (NAD83), U.S. Survey Feet
VERTICAL DATUM: North American Vertical Datum of 1988 (NAVD88)

0 5
Miles

Publish Date: 2021/11/09 2:11 PM | User: dholmer
Filepath: K:\Projects\0737-Coastal Bend Bays and Estuaries Project\Dagger Point Coastal Habitat Restoration\0737-EA-001 (Vicinity Map).dwg Figure 1

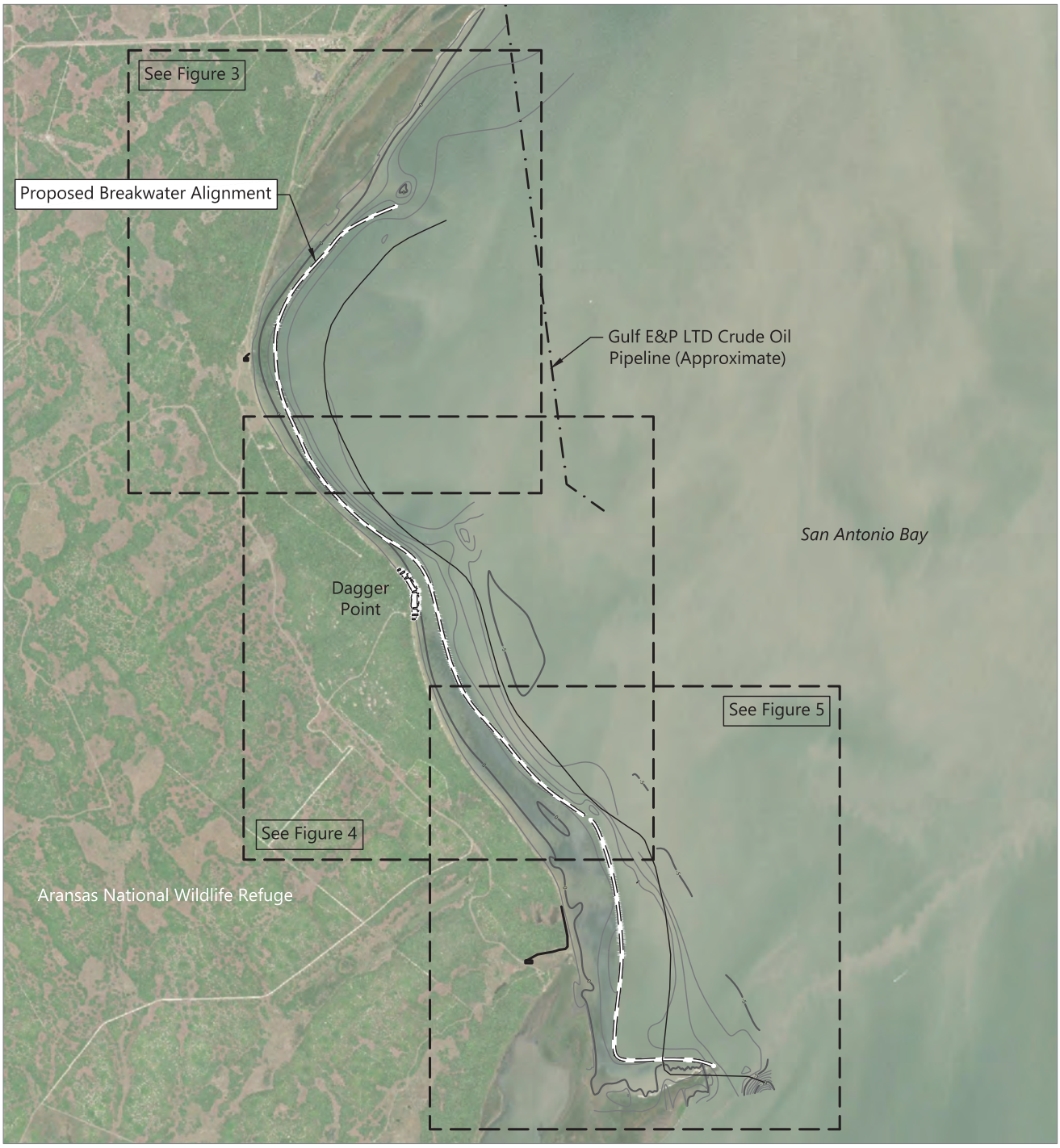
ANCHOR QEA

Figure 1
Vicinity Map

Environmental Assessment
Dagger Point Coastal and Marine Habitat Protection and Restoration

PERMITTED PLANS

SWG-2018-00279



SOURCES:

1. Aerial image ©2019 Microsoft Corporation ©2019 DigitalGlobe ©CNESS (2019) Distribution Airbus (DS)
2. Bathymetric survey by Naismith Marine Services dated August 2019

HORIZONTAL DATUM: Texas State Plane South Central, North American Datum of 1983 (NAD83), U.S. Survey Feet

VERTICAL DATUM: North American Vertical Datum of 1988 (NAVD88)

LEGEND:

Existing Bathymetry (1' Interval)

0 3600

Feet

Publish Date: 2021/11/09 2:11 PM | User: dholmer

Filepath: K:\Projects\0737-Coastal Bend Bays and Estuaries Project\Dagger Point Coastal Habitat Restoration\0737-EA-002 (Plan View).dwg Figure 2

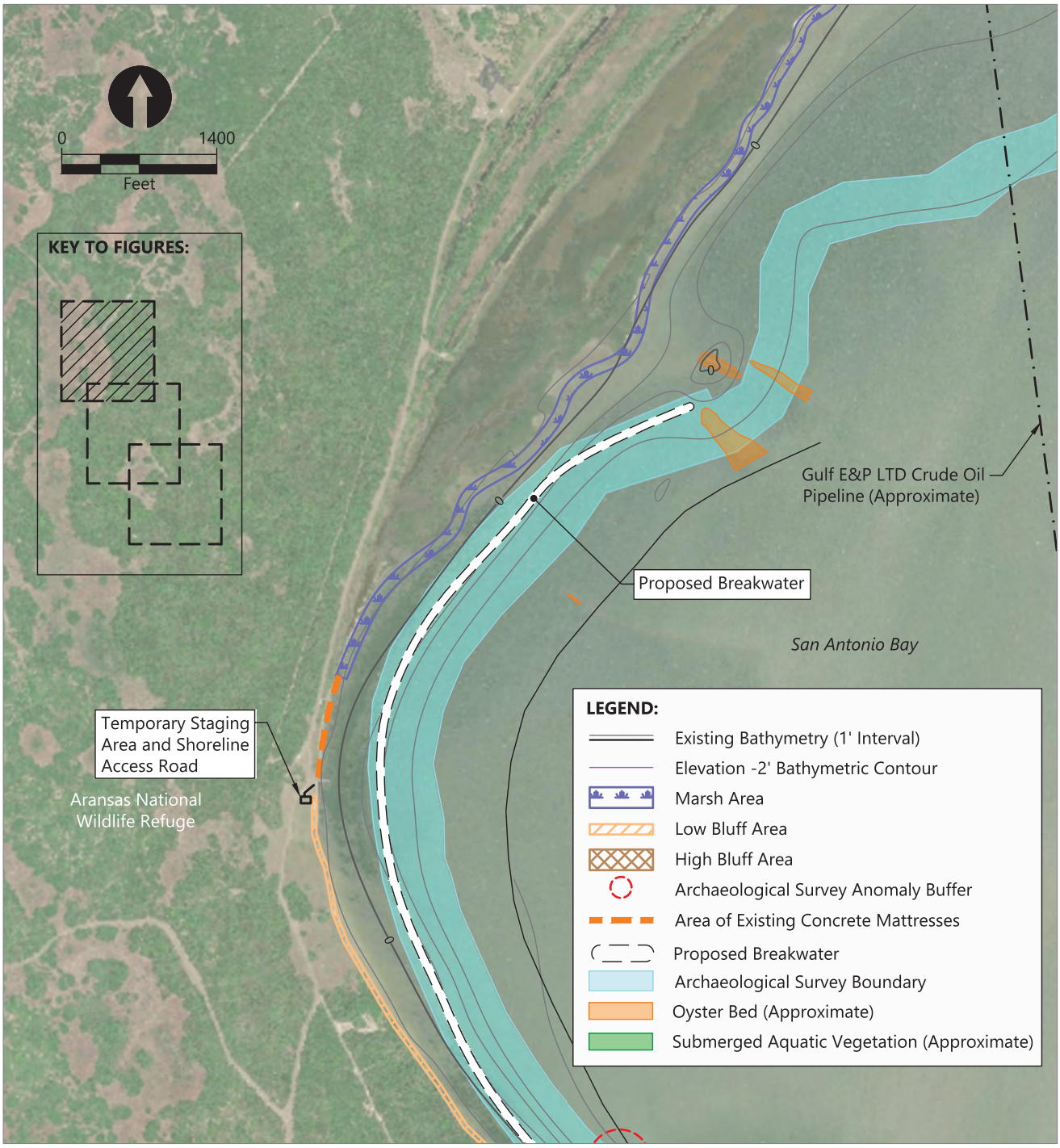
ANCHOR QEA

Figure 2

Project Area Plan View

Environmental Assessment

Dagger Point Coastal and Marine Habitat Protection and Restoration



SOURCES:

1. Aerial image ©2019 Microsoft Corporation ©2019 DigitalGlobe ©CNESS (2019) Distribution Airbus (DS)
2. Bathymetric survey by Naismith Marine Services dated August 2019
3. Submerged aquatic vegetation (SAV) and oyster surveys by Bio West conducted between April and May 2020.
4. Archaeological survey by SEARCH conducted between April and May 2020, and January 2021

HORIZONTAL DATUM: Texas State Plane South Central, North American Datum of 1983 (NAD83), U.S. Survey Feet
VERTICAL DATUM: North American Vertical Datum of 1988 (NAVD88)

NOTES:

1. Anchor QEA proposed breakwater will generally be placed along the -1.0 to -2.0 foot NAVD 88 contour and/or outside of the extents of the SAV.
2. Gap spacing and dimensions between breakwater segments to be determined during advancement of design.

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Filepath: K:\Projects\0737-Coastal Bend Bays and Estuaries Project\Dagger Point Coastal Habitat Restoration\0737-EA-002 (Plan View).dwg Figure 3

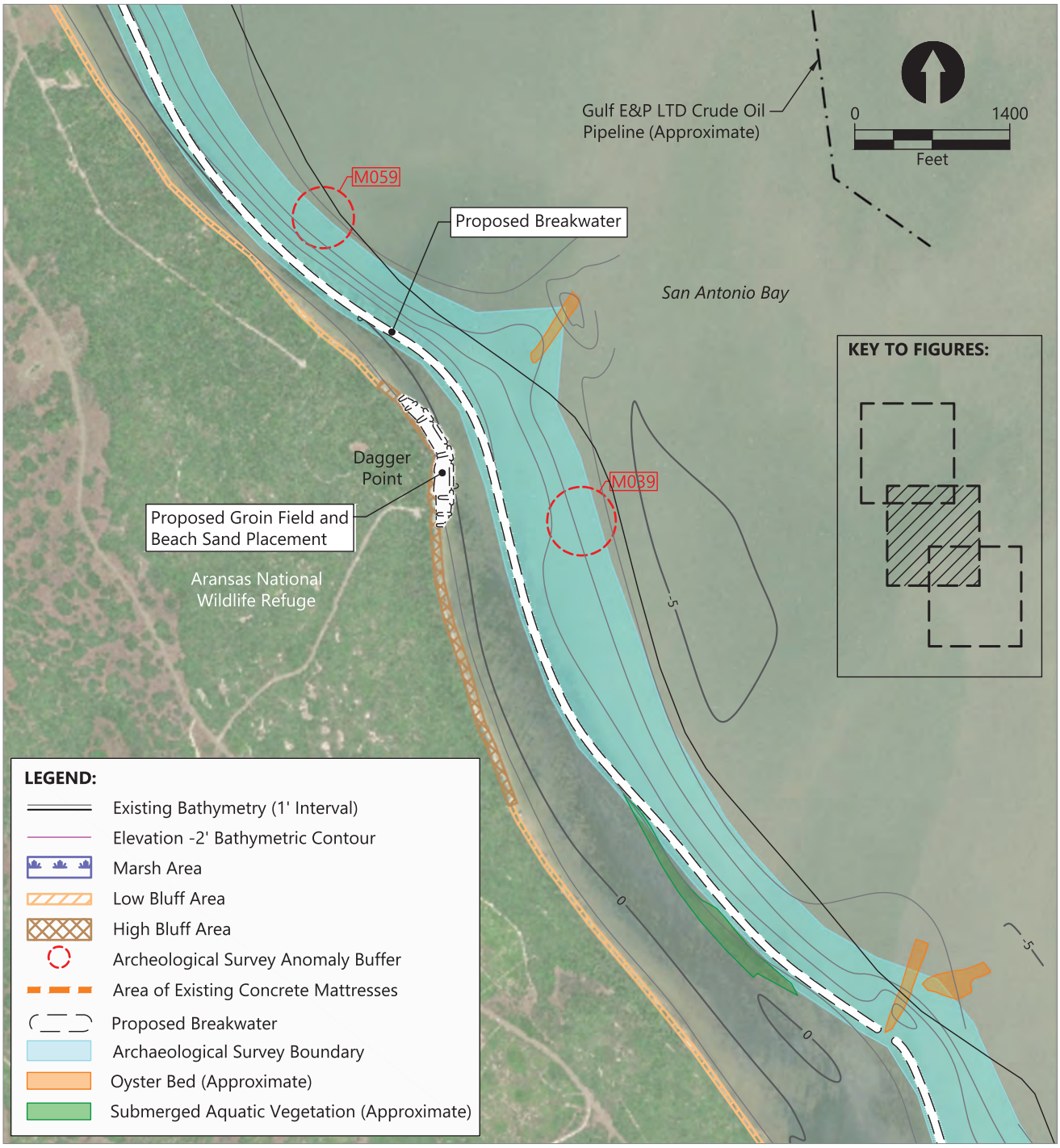
ANCHOR QEA

Figure 3
Plan View North

Environmental Assessment
Dagger Point Coastal and Marine Habitat Protection and Restoration

PERMITTED PLANS

SWG-2018-00279



SOURCES:

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HORIZONTAL DATUM: Texas State Plane South Central, North American Datum of 1983 (NAD83), U.S. Survey Feet
VERTICAL DATUM: North American Vertical Datum of 1988 (NAVD88)

NOTES:

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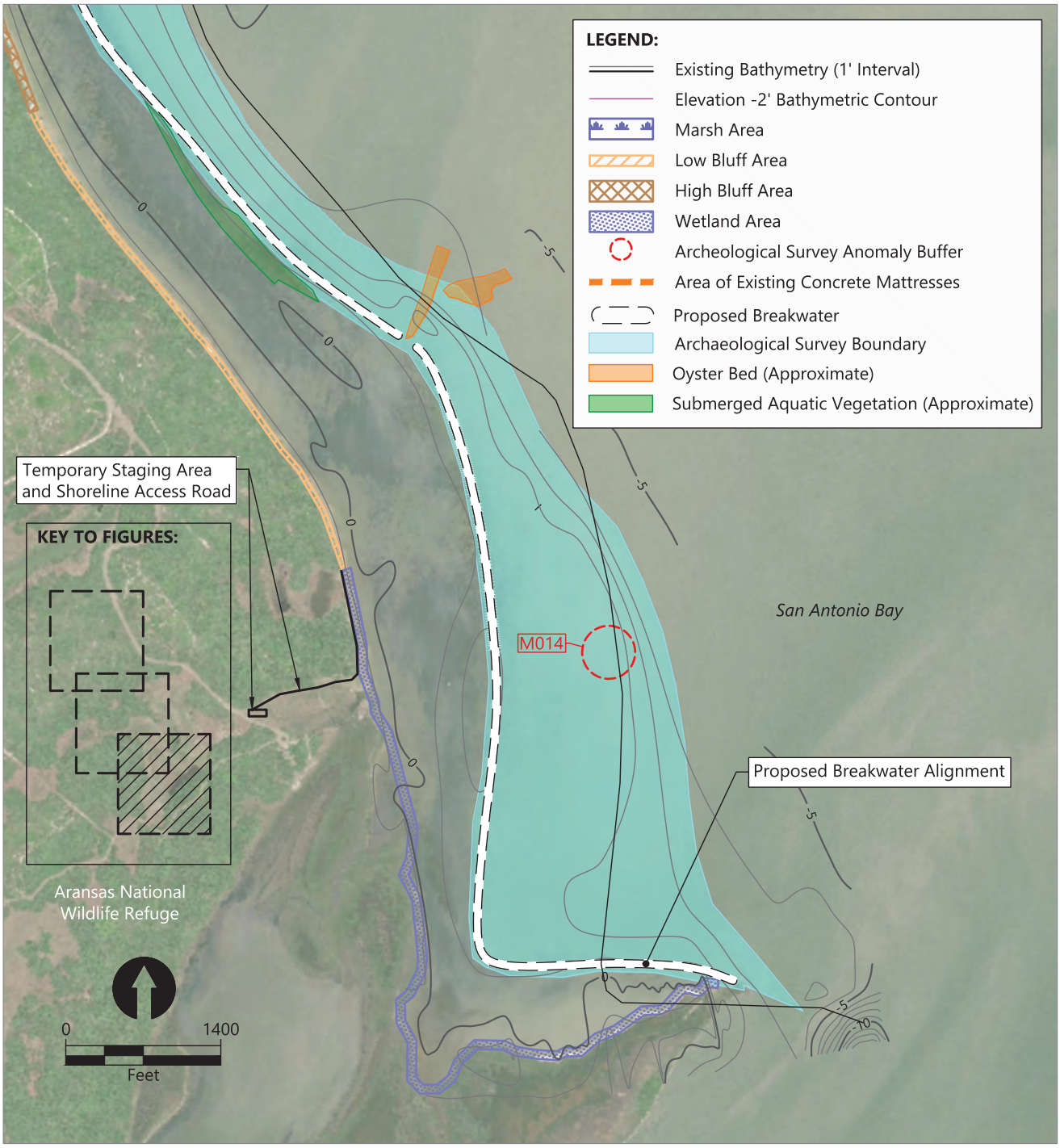
Filepath: K:\Projects\0737-Coastal Bend Bays and Estuaries Project\Dagger Point Coastal Habitat Restoration\0737-EA-002 (Plan View).dwg Figure 4

ANCHOR QEA

Figure 4
Plan View Central

Environmental Assessment
Dagger Point Coastal and Marine Habitat Protection and Restoration



SOURCES:

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2. Bathymetric survey by Naismith Marine Services dated August 2019
3. Submerged aquatic vegetation (SAV) and oyster surveys by Bio West conducted between April and May 2020.
4. Archaeological survey by SEARCH conducted between April and May 2020, and January 2021

HORIZONTAL DATUM: Texas State Plane South Central, North American Datum of 1983 (NAD83), U.S. Survey Feet
VERTICAL DATUM: North American Vertical Datum of 1988 (NAVD88)

NOTES:

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2. Gap spacing and dimensions between breakwater segments to be determined during advancement of design.

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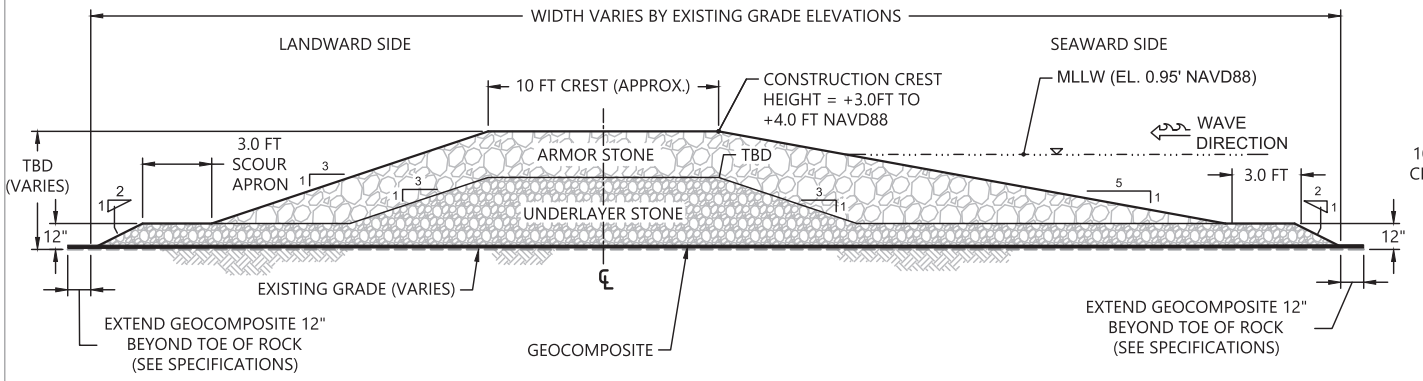
Filepath: K:\Projects\0737-Coastal Bend Bays and Estuaries Project\Dagger Point Coastal Habitat Restoration\0737-EA-002 (Plan View).dwg Figure 5

ANCHOR QEA

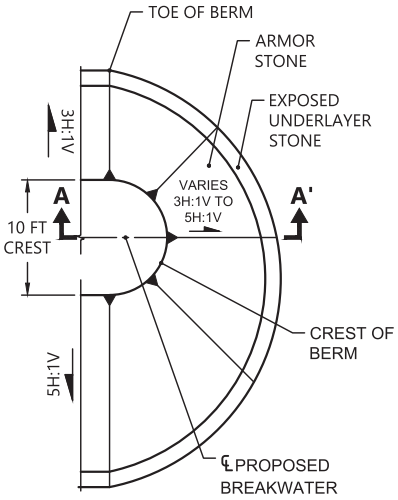
Figure 5
Plan View South

Environmental Assessment
Dagger Point Coastal and Marine Habitat Protection and Restoration

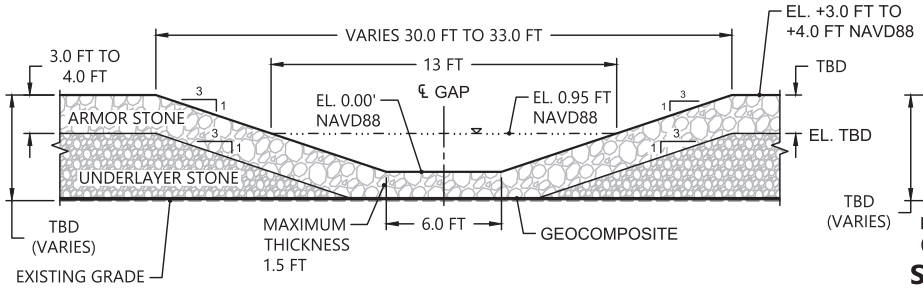


NOTE:
(1) Crest width, height, and base width of breakwater subject to revision during advancement of design.

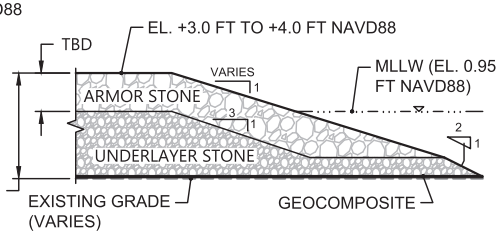
Typical Rock Rubble Breakwater Cross Section
Not to Scale



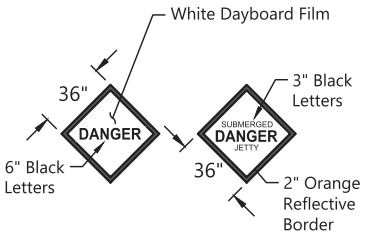
Typical Breakwater Roundhead at End Plan View
Not to Scale



Typical Breakwater Gap Profile
Not to Scale



Section A-A' - Typical Breakwater Roundhead at End
Not to Scale



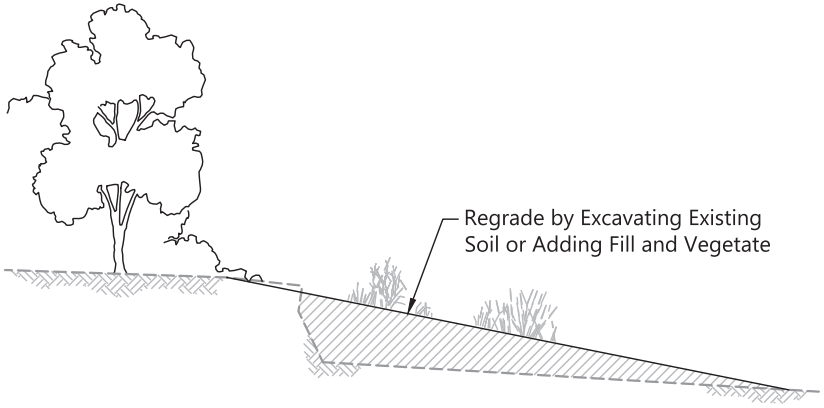
Typical Warning and/or Aid to Navigation Signage
Not to Scale

NOTE:
For information only. Final Aid to Navigation details to be determined by USCG after approval of the USACE permit.

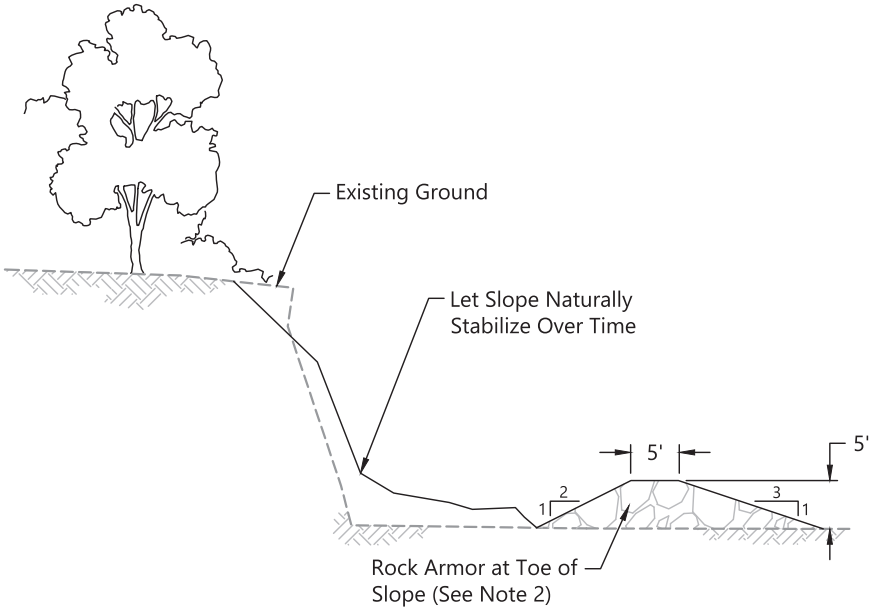
Publish Date: 2021/11/09 2:11 PM | User: dholmer
Filepath: K:\Projects\0737-Coastal Bend Bays and Estuaries Project\Dagger Point Coastal Habitat Restoration\0737-EA-002 (Plan View).dwg Figure 6

ANCHOR QEA

Figure 6
Typical Rock Rubble Breakwater Details



Typical Low Bluff Regrading and Vegetating
Not to Scale



Typical High Bluff Self Stabilization and Toe Protection
Not to Scale

NOTES:
1. After slope has stabilized, planting of the slope may be carried out to further stabilize the slope.
2. Actual design to be determined during final design. Geometry shown is for the purposes of estimating proposed impacts for permit.

Publish Date: 2021/11/09 2:11 PM | User: dholmer
Filepath: K:\Projects\0737-Coastal Bend Bays and Estuaries Project\Dagger Point Coastal Habitat Restoration\0737-EA-002 (Plan View).dwg Figure 7

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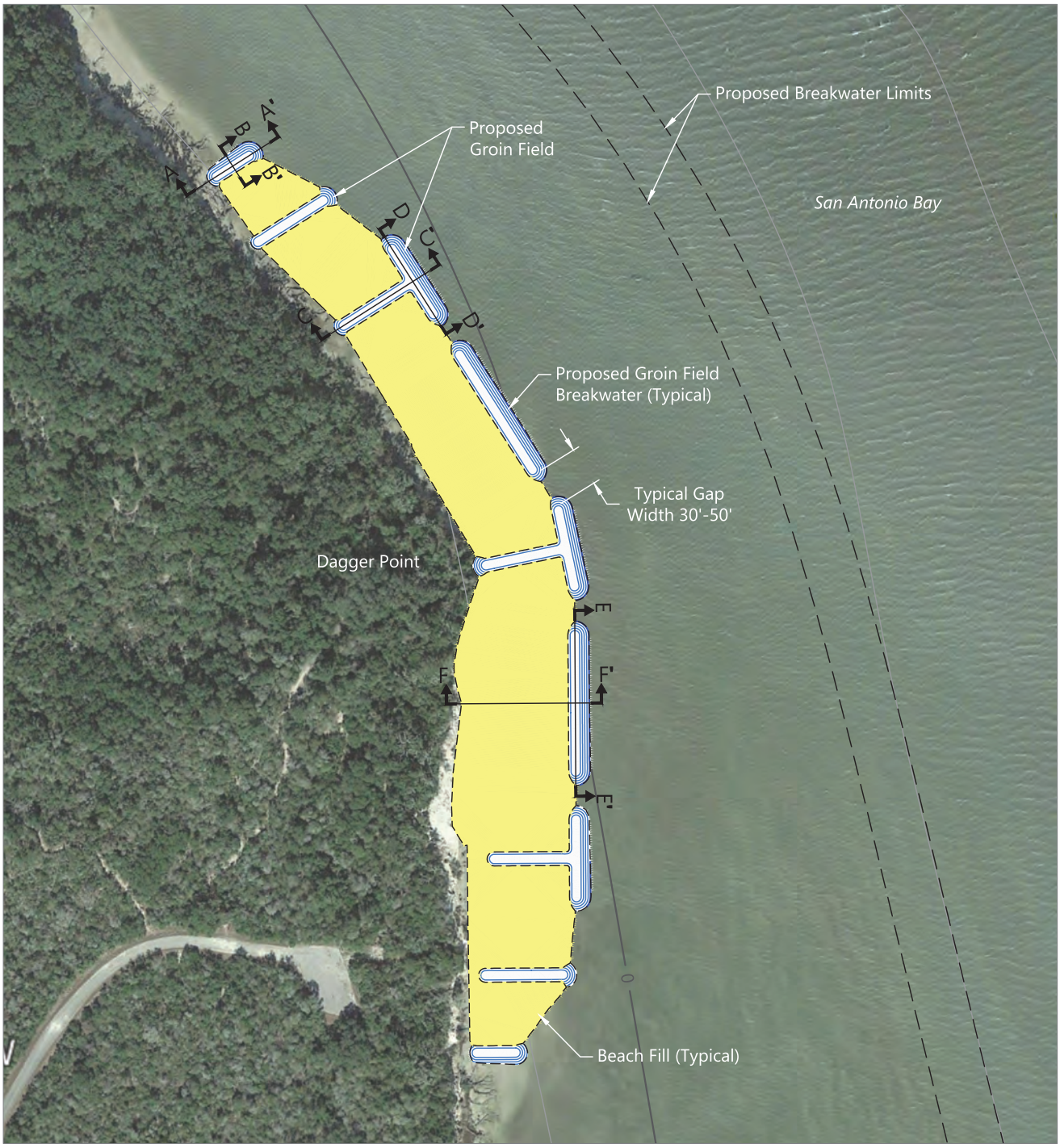
Figure 7
Bluff Stabilization Alternatives

Environmental Assessment
Dagger Point Coastal and Marine Habitat Protection and Restoration



SOURCES:
1. Aerial image ©2020 Google Earth Pro dated January 2017
2. Bathymetric survey by Naismith Marine Services dated August 2019

HORIZONTAL DATUM: Texas State Plane South Central, North American Datum of 1983 (NAD83), U.S. Survey Feet
VERTICAL DATUM: North American Vertical Datum of 1988 (NAVD88)

LEGEND:

Existing Bathymetry (1' Interval)

A — Cross Section Location and Designation (See Figures 9, 10 & 11)

0 200
Feet

Publish Date: 2021/11/09 2:11 PM | User: dholmer
Filepath: K:\Projects\0737-Coastal Bend Bays and Estuaries Project\Dagger Point Coastal Habitat Restoration\0737-EA-003 (Groin Field).dwg Figure 8

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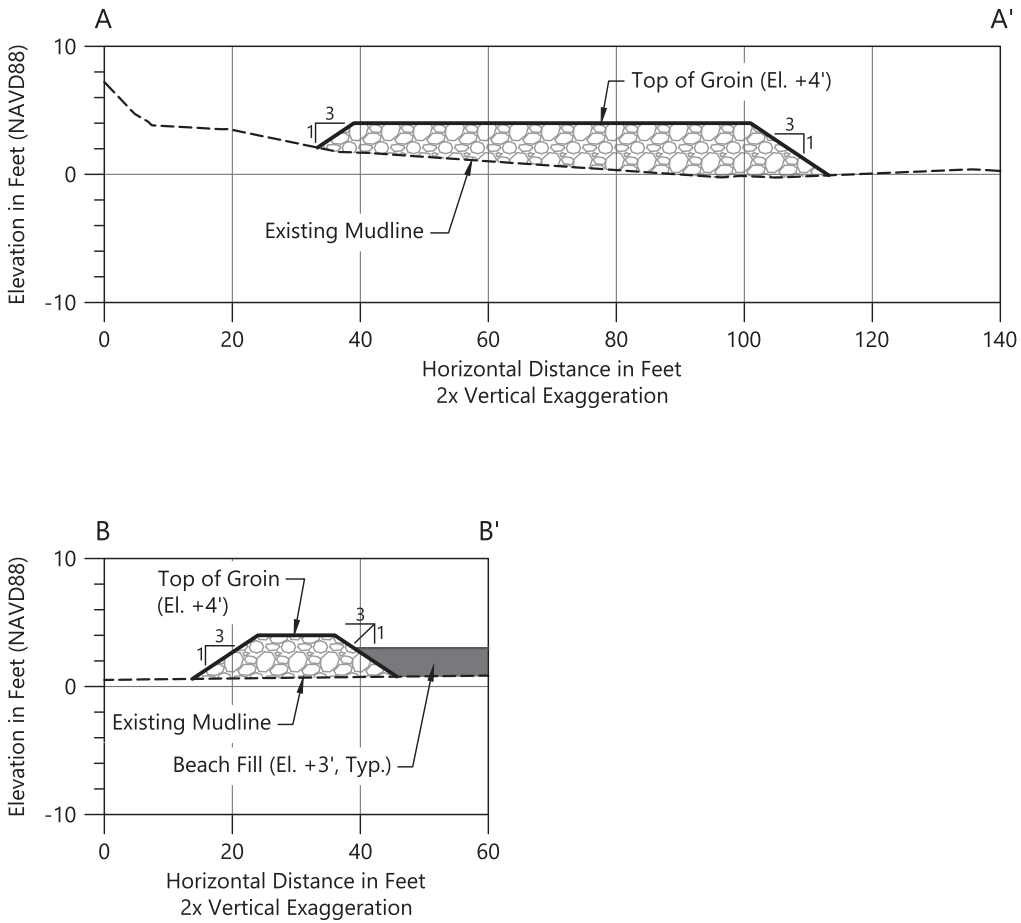
Figure 8
Proposed Groin Field and Beach Fill Area Plan View

Environmental Assessment
Dagger Point Coastal and Marine Habitat Protection and Restoration



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Filepath: K:\Projects\0737-Coastal Bend Bays and Estuaries Project\Dagger Point Coastal Habitat Restoration\0737-EA-003 (Groin Field).dwg Figure 9

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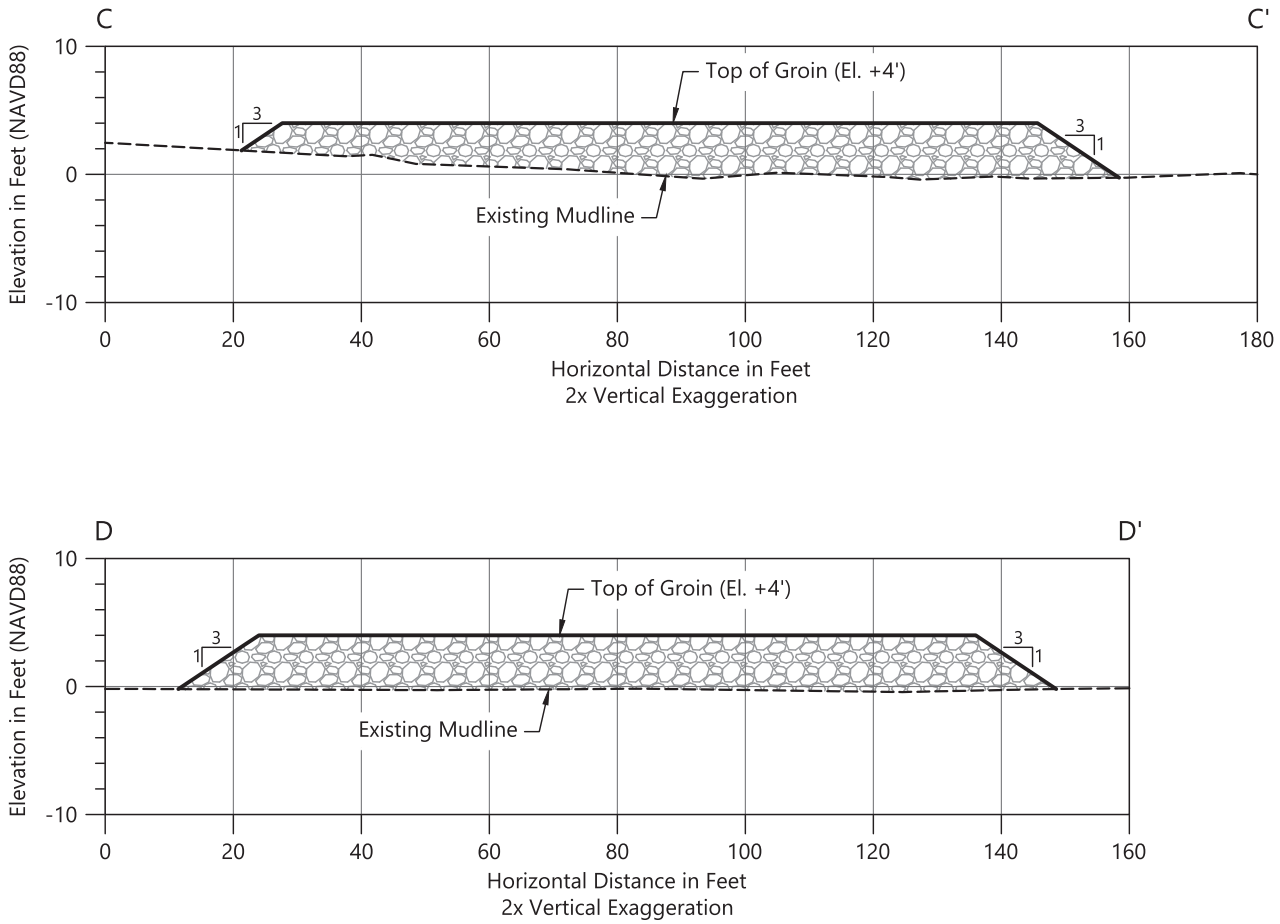
Figure 9
Typical Straight Groin Cross Sections

Environmental Assessment
Dagger Point Coastal and Marine Habitat Protection and Restoration



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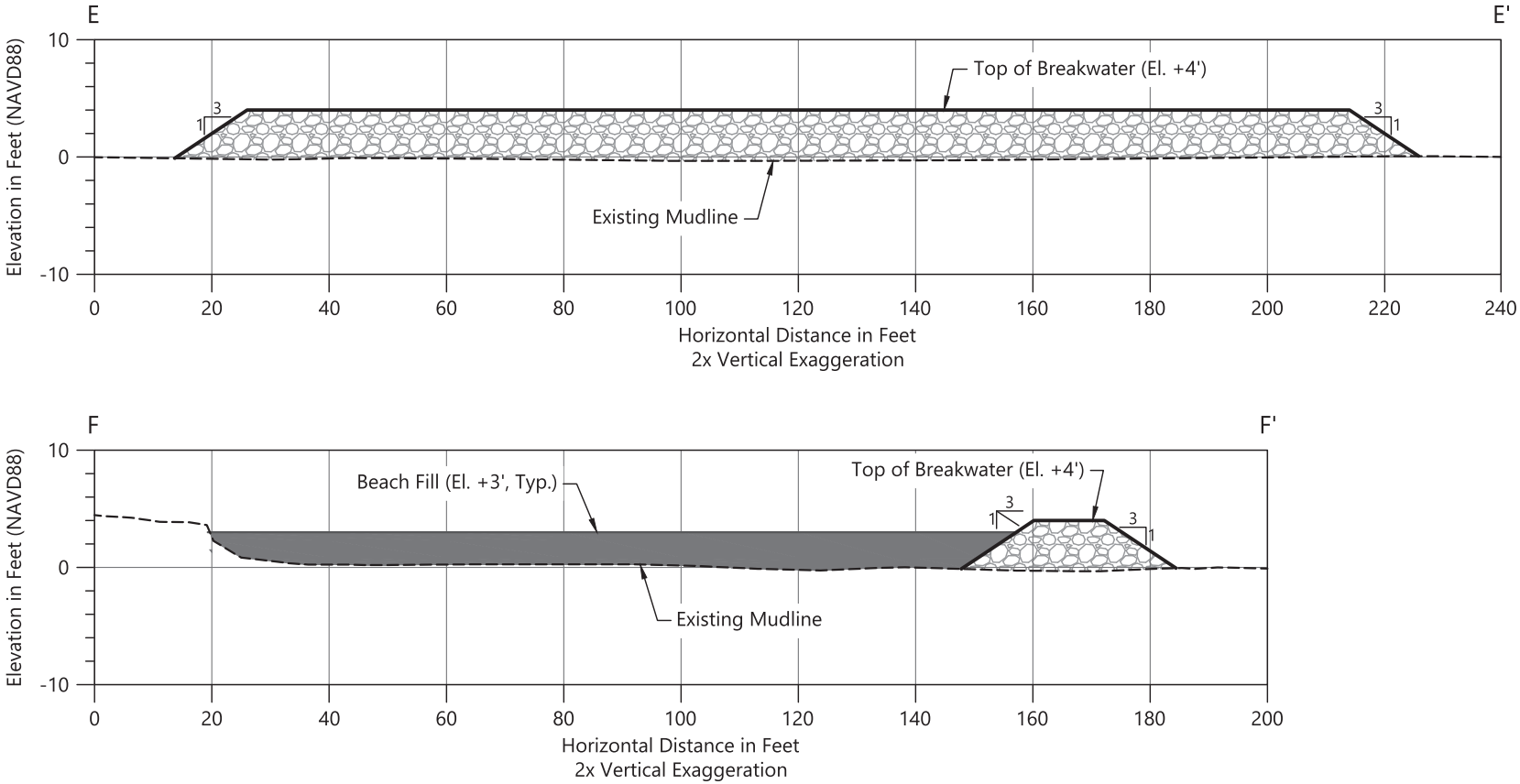
Filepath: K:\Projects\0737-Coastal Bend Bays and Estuaries Project\Dagger Point Coastal Habitat Restoration\0737-EA-003 (Groin Field).dwg Figure 10

ANCHOR QEA

Figure 10
Typical T-Groin Cross Sections

Environmental Assessment
Dagger Point Coastal and Marine Habitat Protection and Restoration



Publish Date: 2021/11/09 2:11 PM | User: dholmer
Filepath: K:\Projects\0737-Coastal Bend Bays and Estuaries Project\Dagger Point Coastal Habitat Restoration\0737-EA-003 (Groin Field).dwg Figure 11

ANCHOR QEA

Figure 11
Typical Breakwater Cross Sections

Environmental Assessment
Dagger Point Coastal and Marine Habitat Protection and Restoration

PERMITTED PLANS

SWG-2018-00279
Attachment A

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

August 2, 2022

Mr. Joe Saenz
Refuge Manager
Aransas NWR
1 Wildlife Circle
PO Box 100
Austwell, TX 77950

Re: USACE Permit Application No. SWG-2018-00279

Dear Mr. Saenz:

This letter is in response to the 401 Certification Request dated July 6, 2022, for the Public Notice dated May 19, 2022, on the U. S. Fish and Wildlife Service proposal to construct a shoreline protection and bluff stabilization project for the eroding shoreline of the Aransas National Wildlife Refuge along San Antonio Bay, particularly along Dagger Point. The project is located 8 miles south-southeast of Austwell in Aransas County, Texas.

The Texas Commission on Environmental Quality (TCEQ) has reviewed the public notice and related application information along with the 401 State Certification Request Form. On behalf of the Executive Director and based on our evaluation of the information contained in these documents, the TCEQ certifies that there is reasonable assurance that the project will be conducted in a way that will not violate water quality standards and will comply with water quality requirements. General information regarding this water quality certification, including standard provisions of the certification, is included as an attachment to this letter.

The proposed project is a continuous breakwater around Dagger Point. This includes a series of segmented rock breakwaters on the northern and southern alignments parallel and offshore of the existing shoreline and onshore toe protection for the eroding bluffs. Approximately 4,200 ft of armored toe protection will be constructed at the base of the high bluffs including a series of near shore breakwaters and groins with sand fill constructed along a 1,300-ft section of the high bluffs at Dagger Point.

No mitigation is proposed. The project is expected to protect the existing shoreline by reducing wave energy and erosion and preserve the remaining estuarine marsh and coastal bluff habitats.

The TCEQ has reviewed this proposed action for consistency with the Texas Coastal Management Program (CMP) goals and policies in accordance with the regulations of the Coastal Coordination Council and has determined that the proposed action is consistent with the applicable CMP goals and policies.

This certification was reviewed for consistency with the CMP's development in critical areas policy {Title 31, Texas Administrative Code (TAC), Chapter (§) 501.23} and dredging and dredged material disposal and placement policy {31 TAC §501.25}. This certification complies with the CMP goals {31 TAC §501.12(1, 2, 3, 5)} applicable to these policies.

No review of property rights, location of property lines, nor the distinction between public and private ownership has been made, and this certification may not be used in any way with regard to questions of ownership.

If you require additional information or further assistance, please contact Ms. Jenna R. Lueg, Water Quality Assessment Section, Water Quality Division (MC-150), at (512) 239-4590.

Sincerely,

Robert Sadlier, Deputy Director
Water Quality Division

RS/JRL

Attachment

ccs: Mr. Joe Saenz, U.S. Fish and Wildlife Service via email at joe.saenz@fws.gov

Ms. Renee Robertson Anchor QEA, LLC via email at rrobertson@anchorqea.com

Mr. Mark Pattillo, U.S. Army Corps of Engineers via email at mark.e.pattillo@usace.army.mil

Mr. Joe Saenz
USACE Permit Application No. SWG-2018-00279
Attachment 1 – Dredge and Fill Certification
Page 1 of 3

WORK DESCRIPTION: As described in the 401 Certification request dated July 6, 2022, and the public notice dated May 19, 2022

SPECIAL CONDITIONS: None

GENERAL: This certification, issued pursuant to the requirements of Title 30, Texas Administrative Code, Chapter 279, is restricted to the work described in the Public Notice dated May 19, 2022, and the 401 Certification Request dated July 6, 2022, and shall be concurrent with the Corps of Engineers (COE) permit. This certification may be extended to any minor revision of the COE permit when such change(s) would not result in an impact on water quality. The Texas Commission on Environmental Quality (TCEQ) reserves the right to require full joint public notice on a request for minor revision.

STANDARD PROVISIONS: These following provisions attach to any permit issued by the COE and shall be followed by the permittee or any employee, agent, contractor, or subcontractor of the permittee during any phase of work authorized by a COE permit. These conditions are necessary to ensure that the project is conducted in a way that will comply with water quality requirements in accordance with Texas Water Code §26.003 and antidegradation policy in 30 TAC §307.5, and not result in violations of general water quality criteria in 30 TAC 307.4(b)(2)-(5)

1. The water quality of wetlands shall be maintained in accordance with all applicable provisions of the Texas Surface Water Quality Standards including the General, Narrative, and Numerical Criteria.

2. The applicant shall not engage in any activity which will cause surface waters to be toxic to man, aquatic life, or terrestrial life.

3. Permittee shall employ measures to control spills of fuels, lubricants, or any other materials to prevent them from entering a watercourse. All spills shall be promptly reported to the TCEQ by calling the State of Texas Environmental Hotline at 1-800-832-8224.

4. Sanitary wastes shall be retained for disposal in some legal manner. Marinas and similar operations which harbor boats equipped with marine sanitation devices shall provide state/federal permitted treatment facilities or pump out facilities for ultimate transfer to a permitted treatment facility. Additionally, marinas shall display signs in appropriate locations advising boat owners that the discharge of sewage from a marine sanitation device to waters in the state is a violation of state and federal law.

5. Materials resulting from the destruction of existing structures shall be removed from the water or areas adjacent to the water and disposed of in some legal manner.

6. A discharge shall not cause substantial and persistent changes from ambient conditions of turbidity or color. The use of silt screens or other appropriate methods is encouraged to confine suspended particulates.

7. The placement of any material in a watercourse or wetlands shall be avoided and placed there only with the approval of the Corps when no other reasonable alternative is available. If work within a wetland is unavoidable, gouging or rutting of the substrate is prohibited. Heavy equipment shall be placed on mats to protect the substrate from gouging and rutting if necessary.

8. Dredged Material Placement: Dredged sediments shall be placed in such a manner as to prevent any sediment runoff onto any adjacent property not owned by the applicant. Liquid runoff from the disposal area shall be retained on-site or shall be filtered and returned to the watercourse from which the dredged materials were removed. Except for material placement authorized by this permit, sediments from the project shall be placed in such a manner as to prevent any sediment runoff into waters in the state, including wetlands.

9. If contaminated spoil that was not anticipated or provided for in the permit application is encountered during dredging, dredging operations shall be immediately terminated and the TCEQ shall be contacted by calling the State of Texas Environmental Hotline at 1-800-832-8224. Dredging activities shall not be resumed until authorized by the Commission.

10. Contaminated water, soil, or any other material shall not be allowed to enter a watercourse. Noncontaminated storm water from impervious surfaces shall be controlled to prevent the washing of debris into the waterway.

11. Storm water runoff from construction activities that result in a disturbance of one or more acres, or are a part of a common plan of development that will result in the disturbance of one or more acres, must be controlled and authorized under Texas Pollutant Discharge Elimination System (TPDES) general permit TXR150000. A copy of the general permit, application (notice of intent), and additional information is available at: http://www.tceq.texas.gov/permitting/stormwater/wq_construction.html or by contacting the TCEQ Storm Water & Pretreatment Team at (512) 239-4671.

12. Upon completion of earthwork operations, all temporary fills shall be removed from the watercourse/wetland, and areas disturbed during construction shall be seeded, riprapped, or given some other type of protection to minimize subsequent soil erosion. Any fill material shall be clean and of such composition that it will not

adversely affect the biological, chemical, or physical properties of the receiving waters.

13. Disturbance to vegetation will be limited to only what is absolutely necessary. After construction, all disturbed areas will be revegetated to approximate the pre-disturbance native plant assemblage.

14. Where the control of weeds, insects, and other undesirable species is deemed necessary by the permittee, control methods which are nontoxic to aquatic life or human health shall be employed when the activity is located in or in close proximity to water, including wetlands.

15. Concentrations of taste and odor producing substances shall not interfere with the production of potable water by reasonable water treatment methods, impart unpalatable flavor to food fish including shellfish, result in offensive odors arising from the water, or otherwise interfere with reasonable use of the water in the state.

16. Surface water shall be essentially free of floating debris and suspended solids that are conducive to producing adverse responses in aquatic organisms, putrescible sludge deposits, or sediment layers which adversely affect benthic biota or any lawful uses.

17. Surface waters shall be essentially free of settleable solids conducive to changes in flow characteristics of stream channels or the untimely filling of reservoirs, lakes, and bays.

18. The work of the applicant shall be conducted such that surface waters are maintained in an aesthetically attractive condition and foaming or frothing of a persistent nature is avoided. Surface waters shall be maintained so that oil, grease, or related residue will not produce a visible film of oil or globules of grease on the surface or coat the banks or bottoms of the watercourse.

19. This certification shall not be deemed as fulfilling the applicant's/permittee's responsibility to obtain additional authorization/approval from other local, state, or federal regulatory agencies having special/specific authority to preserve and/or protect resources within the area where the work will occur.

SWG-2018-00279
Attachment B

PERMITTED PLANS

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
263 13th Avenue South
St. Petersburg, Florida 33701-5505
https://www.fisheries.noaa.gov/region/southeast

9/7/2022

F/SER31:SG
SERO-2022-00591

Manuel Perez, Regional Supervisor, Coastal Texas Zone
United States Fish and Wildlife Service
United States Department of the Interior
Post Office Box 1306
Albuquerque, New Mexico 87103

Ref.: Request for Initiation of Expedited Informal Programmatic Consultation under section 7(a)(2) of the Endangered Species Act for coastal projects within the U.S. Fish and Wildlife Service National Wildlife Refuges in coastal Texas – EXPEDITED TRACK

Dear Manuel Perez,

This letter responds to your September 1, 2022, request pursuant to Section 7 of the Endangered Species Act (ESA) for consultation with the National Marine Fisheries Service (NMFS) on the subject action.

We reviewed the action agency's consultation request document and related materials. Based on our knowledge, expertise, and the action agency's materials, we concur with the action agency's conclusions that the proposed action is not likely to adversely affect the NMFS ESA-listed species and/or designated critical habitat. This concludes your consultation responsibilities under the ESA for species and/or designated critical habitat under NMFS's purview. Reinitiation of consultation is required and shall be requested by the action agency or by NMFS where discretionary Federal involvement or control over the action has been retained or is authorized by law and: (a) take occurs; (b) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered in this consultation; (c) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not previously considered in this consultation; or (d) if a new species is listed or critical habitat designated that may be affected by the action.

We look forward to further cooperation with you on other projects to ensure the conservation of our threatened and endangered marine species and designated critical habitat. If you have any questions on this consultation, please contact Biologist's Sarah Garvin, Consultation Biologist, at (727) 342-0249 or by email at Sarah.Garvin@noaa.gov.

Sincerely,

REECE.KARLA.MICHELLE.1365885962 Digitally signed by REECE.KARLA.MICHELLE.1365885962 Date: 2022.09.07 14:20:02 -04'00'

for Kelly Shotts
Acting Regional Administrator
for Protected Resources

File: 1514-22.i

NOTICE TO PERMITTEES

Department of the Army Permits for Work in Navigable Waters require attention to administration and policies which are often misunderstood or disregarded. To avoid possible misinterpretations and to expedite procedures, post-authorization permit requirements and pertinent information are outlined as follows:

1. Permits remain in effect until revoked, relinquished, or the structures are removed. An extension of time for completion of structures or work may be granted provided that evidence is furnished of the bona fide intention of the permittee to complete the work within a reasonable time. Coordination with Federal and state agencies, and/or the public may be required. If work or structures are not completed within the time provided in the permit, it is the permittee' s responsibility to request an extension of time at least 4 months before the expiration date.

2. Maintenance of authorized completed structures may be done at any time, under the Corps of Engineers Nationwide Permit (NWP) program, without extending the completion period. Unless maintenance dredging is authorized by the original permit, specific prior approval is required before such work is commenced in navigable waters. Please visit our website for further information or call 409-766-3869.

3. If ownership of structures or work covered by a permit is transferred, the District Commander must be notified immediately. The notification will provide information so that permit responsibilities can be changed to the new owner or assignee. Please visit our website for further information or call 409-766-3869.

4. Projects that may affect Federal properties (owned or controlled by Corps of Engineers) often require real estate authorizations from the Corps Real Estate Division prior to impacting any of these Federally-owned/operated lands. Please visit the Galveston District's website for the most current information regarding the District's outgrant policy at http://www.swg.usace.army.mil/BusinessWithUs/RealEstateDivision/Outgrants.aspx.

5. All changes, associated with the Corps of Engineers authorization, must be submitted and approved, to the District Commander prior to start of work in Waters of the United States.

6. Permits should not be considered as an approval of design features of any structure authorized or an implication that such structure is adequate for the purpose intended.

DISTRICT COMMANDER
GALVESTON DISTRICT
CORPS OF ENGINEERS

USACE Section 10/404 Permit Application

Supplemental Information for the Dagger Point Coastal and Marine Habitat Protection and Restoration Project

Purpose and Need

The U.S. Fish and Wildlife Service (USFWS) is proposing to construct a shoreline protection and bluff stabilization project for the eroding shoreline of Aransas National Wildlife Refuge (ANWR) on the eastern shoreline of the Blackjack Unit along San Antonio Bay, particularly near Dagger Point (Figure 1). The purpose of the project is to protect the existing shoreline by reducing wave energy and slowing the rate of erosion. The project would also help to preserve the remaining estuarine marsh and coastal bluff habitats and provide opportunities for habitat restoration. Additionally, public infrastructure such as access roads, parking areas, and viewing piers would be protected from continued erosion and wave impacts.

The eastern shoreline of the Blackjack Unit along San Antonio Bay is exposed to erosive forces due to water and wind acting on the shoreline. In general, the wave climate in San Antonio Bay consists of locally generated waves that are the result of seasonal wind patterns as well as tropical and extratropical storms. The primary wind and wave direction at the project area is from the southeast across a fetch of 9 miles of San Antonio Bay. Relative sea level rise, wave impacts, and tropical storms have caused erosion and loss of uplands along a 5-mile length of shoreline. Hurricane Harvey made landfall in the project area in 2017, and ANWR staff observed approximately 40 feet of shoreline loss due to that event. In the long-term future, the ANWR shoreline will likely become more vulnerable to erosive forces from low-frequency, high-energy storms as climate change and relative sea level rise increase the intensity of storm events in the Gulf Coast region (Knutson 2020).

The project area consists of low-lying coastal marshes, low bluffs between 7 and 9 feet high, and high bluffs (up to 30 feet high) in the vicinity of Dagger Point. The shoreline has been subject to erosional forces and subsequent estuarine habitat shoreline loss that has been documented for several decades. The University of Texas Bureau of Economic Geology (UTBEG; Paine et al. 2016) has mapped coastal erosion rates along the Texas coastline from the 1930s to the 2010s. Using the UTBEG mapping application, the shoreline of ANWR along San Antonio Bay shows shoreline long-term retreat rates of several feet per year in portions of the project area.

The bluffs along the project area facing San Antonio Bay are eroding due to wave action at the toe where the bluffs meet the shoreline and from wind action that mobilizes the unconsolidated sand exposed on the face of the bluffs. Waves that impact the toe of the bluff erode the toe and cause sloughing of the bluff face immediately above this area, further exposing loose sediment. This

process manifests as a shearing-off of thin layers of the bluff face, which leaves vertical or extremely steep slopes along the face. The sand that is eroded from the bluff is then transported into the bay. This type of erosion does not allow the bluff to erode to a stable slope. Furthermore, the steep slope and continual erosion also prevents vegetation from taking root on the bluff face.

Proposed Project Design

The proposed project is to construct a segmented rubble-mound breakwater offshore and parallel to a 5-mile length of the eastern shoreline of the Blackjack Unit and install armored structural toe protection along 4,200 feet of the base of the eroding high bluffs with regrading of eroded low bluff scarps (Figures 4 through 12). All structures would be constructed with materials that would better withstand storm impacts and wave energy while protecting coastal habitats. The proposed structures and construction methodologies are proven approaches used in similar environments in Texas and the U.S. Gulf of Mexico coast. A traditional low-crested rubble-mound (rock) breakwater structure is proposed as the conceptual design because it can be efficiently maintained and adapted once it is constructed, compared to other construction materials and methods.

The final offshore breakwater design is ongoing. The conceptual design of the breakwater structures includes a maximum crest elevation between +3.0 to +4.0 feet North American Vertical Datum of 1988 (NAVD88) with a crest width of 10 feet (Figure 7). The side slopes of the bayward and landward sides of the breakwater are 5 feet horizontal to 1 foot vertical (5H:1V) and 3H:1V. The breakwater would be continuous around Dagger Point (Figure 5) but will contain gaps along the northern and southern alignments. The length of each northern and southern breakwater segment is expected to be 200 feet long (and will not exceed 500 feet) with a gap of around 30 feet from the crest of each subsequent segment to allow for faunal ingress and egress. Modeling of wave energy was performed to optimize the structure segment lengths and gaps; and shorter segments were designed to facilitate fish passage.

Each gap will be underlain by a rock sill to prevent scouring. The gap sill elevation will also be determined during final design but is expected to be below the mean lower low water (MLLW) elevation (0.95 feet NAVD 88) at 1.0 to 1.5 feet above the breakwater base elevation of -1.5 to -2.0 feet NAVD 88. This meets the NOAA recommendation of gap heights should be no more than 18" above the waterbottom elevation as discussed during the JEM meeting. Buffers of 20 to 30 feet between the breakwaters and any submerged aquatic vegetation (SAV) and oyster reefs identified during the SAV and oyster reef survey will be established. Construction access for the offshore breakwaters would be marine based to minimize impacts to Refuge uplands and estuarine marsh habitats.

A range of breakwater configurations and distances from the existing shoreline was evaluated to assess how different geometries and locations may perform under various wave and water level

conditions, in regard to wave attenuation. Wave modeling was used to evaluate the wave attenuation performance of various breakwater configurations within the project area under a variety of meteorological conditions ranging from annual return-period winds to hurricane events. Overall, the model evaluation results showed an increase in the breakwater system's effectiveness for attenuating waves near the shoreline as the breakwater alignment was moved closer to shore, gapped portions of the alignment were replaced with continuous (no gaps) segments, sills were placed in the gaps, and a conventional structure type was assumed in lieu of a reef structure type. The proposed design and alignment of the breakwaters and bluff stabilization was identified by ANWR staff and project stakeholders as the optimal configuration for providing the highest amount of wave attenuation while avoiding impacts to SAV and oyster reefs and maintaining enough water depth for constructability. The design also incorporated state and federal resource agency representative recommendations that buffers of 20 to 30 feet be established between the breakwater structures and any SAV and oyster reefs identified during the SAV and oyster reef survey.

The preliminary design of the high bluff stabilization component of the project includes the installation of an armored toe to protect 4,200 feet of high bluffs from wave action from the bay. The bluff slope above the toe protection would be allowed to naturally adjust to a stabilized slope angle. Vegetation could then be established on the stable slope through natural recruitment or planting and seeding of desired plant species. Vegetating the slope would reduce erosional forces by reducing the velocity of wind reaching the bluff face surface and allowing the associated root mass to stabilize bluff sediment. Based on the preliminary design, a 1,300-foot length of the high bluff shoreline in the immediate vicinity of Dagger Point would be protected by a groin field consisting of a series of groins and breakwaters with sand fill (Figures 8 through 12). The groins would extend from the shoreline 150 feet and tie into a series of shore parallel breakwaters. Up to 15,000 cubic yards of beach sand fill placed between the shoreline and breakwaters to an elevation of +3.0 feet NAVD88 will be obtained either from a commercial sand supplier or from material dredged from the Gulf Intracoastal Waterway (GIWW). Conceptual design of the high bluff groin field breakwater and groin structures includes a maximum crest elevation of +4.0 feet NAVD88 with a crest width of 10 feet (Figures 10 and 11). The side slopes of the bayward and landward sides of the high bluff protection breakwater and groins are 3 feet horizontal to 1 foot vertical (3H:1V). The final details of the high bluff protection will be determined during final design after hydraulic modeling of the alternatives and additional input from project stakeholders.

The low bluff stabilization design consists of regrading the slope to a more stable profile and vegetating the bluff face. The steepness of the slope gradation will be based on slope stability calculations, aesthetics, and consideration for project area users since the low bluff areas are more accessible to ANWR visitors.

Proposed Construction Methods

Shallow water conditions typically require dredging of access channels to the project area and along the breakwater alignment. Breakwater construction equipment may include barges, tugboats, excavators, skid steer, and crew and survey boats. To avoid the associated impacts and dredging of the waterbottoms, the proposed construction of the breakwater and high bluff protection includes light loading barges. The rock barges would be staged in deeper water areas in the bay and then loaded to smaller barges to lighten the load and decrease the required draft of the vessels to the project site. The light loaded barges and equipment to place the rock typically require water depths greater than 5 feet. Due to the shallow water conditions, equipment barges may need to rest on the water bottom during certain tide events. The water bottom impacts would be temporary and avoid known oyster, SAV, and emergent marsh areas.

Depending on the contractor's means and methods and the feasibility of construction, landside access of equipment, materials, and personnel may be used for construction of the high bluff protection and regrading of low bluffs may require landside access of equipment, materials, and personnel from the uplands to the construction area on the shore if marine-based access is determined to be impractical or too damaging to aquatic resources. If needed, upland staging areas and temporary access ramps to the shoreline would be established near the fishing pier located 6,500 feet to the northwest of Dagger Point or from near the observation tower 9,300 feet to the south. Equipment used for the high bluff protection includes excavators, bulldozers, and dump trucks. If sand is obtained from dredging of the GIWW, a temporary dredge material pipeline will be installed along the shoreline between Dagger Point and the GIWW. Regrading of the low bluffs would occur on land, using excavators and bulldozers to re-shape the slope.

Construction may occur over multiple phases as funding becomes available and/or due to construction windows to avoid low tide months. The cumulative duration of on-site construction activities could extend from 12 to 24 months.

Alternatives Analysis

The no action alternative would not meet the purpose and need of USFWS to provide the current level of managed resources to ANWR and facilitate priority use opportunities for the public. Continuation of the current condition would result in ongoing erosion and loss of habitat, vegetation, and soil that would in turn adversely affect public access and use.

The proposed alternative would meet the purpose and need of USFWS to protect and restore Refuge resources sufficient to manage habitat requirements and visitor priority use activities on ANWR. This project would protect 5 miles of critically eroding shoreline and stabilize eroding bluffs.

Mitigation measures and best management practices have been developed to protect natural and cultural resources during construction activities. Upon completion of all construction activities, priority uses should return to pre-construction levels, which would not contribute to significant cumulative environmental impacts. The overall potential for adverse impacts would be minimal based on the nature of the action and the implementation of the mitigation measures and conditions described in the above analysis.

Threatened and Endangered Species

ANWR is known habitat for listed endangered whooping cranes and northern Aplomado falcons as well as numerous migratory bird and waterfowl species. Other federally listed threatened or endangered species that may be found locally in suitable habitat include the Kemp's ridley sea turtle (endangered), loggerhead sea turtle (threatened), green sea turtle (threatened), hawksbill sea turtle (endangered), leatherback sea turtle (endangered), West Indian Manatee (endangered), and piping plover (threatened).

To minimize disturbance to whooping cranes, construction activities on uplands and the shoreline would need to be regulated between October 15 and April 14. If whooping cranes are observed during construction, crews and equipment will maintain a 1,000-foot buffer from the crane and notify a Service representative. All booms and tall (>20 feet) equipment would be lowered at the end of each workday to minimize crane collision risk (USFWS 2020). If construction activities occur while cranes are on ANWR, Best Management Plans (BMPs) for minimizing disturbance to cranes would include arranging for a USFWS representative updating crews on crane activity near work sites as well as access to those work sites.

During the March 15 through June 15 northern aplomado falcon nesting season, a 1,000-foot buffer around nesting sites must be maintained. Equipment operators must proceed slowly and avoid unnecessary stops to minimize disturbance to falcons. If construction occurs in the vicinity of known nesting areas during the nesting season, a biological monitor will accompany work crews and could halt work if a falcon is observed within 1,000 feet of the work site. Additionally, all booms and tall (>20 feet) equipment would be lowered at the end of each workday to minimize falcon collision risk (USFWS 2020).

Migratory birds are considered to be priority Federal trust species by USFWS on ANWR. If construction activities occur during the breeding season, a qualified biologist may need to conduct an assessment in the project area to determine risk to breeding birds. Construction crews will be instructed to avoid engaging in potentially destructive or disruptive activities in the vicinity of migratory birds to reduce the risk of affecting birds, their nests, or eggs (USFWS 2010).

Work in marine areas that potentially support manatees will require all personnel associated with the project to be instructed about the potential presence of manatees and the need to avoid collisions with and injury to manatees. All work, equipment, and vessel operation should cease if a manatee is spotted within a 50-foot radius (buffer zone) of the active work area. Once the manatee has left the buffer zone on its own accord (manatees must not be herded or harassed into leaving), or after 30 minutes have passed without additional sightings of manatee(s) in the buffer zone, in water work can resume under careful observation for manatee(s) (USFWS 2013).

Similarly, if a sea turtle is observed within 100 yards of the active construction area or vessel movement, appropriate precautions shall be implemented to ensure its protection. These precautions shall include cessation of operation of any moving equipment closer than 50 feet of a sea turtle. Operation of any mechanical construction equipment shall cease immediately if a sea turtle is seen within a 50-foot radius of the equipment. Activities may not resume until the turtle has left the project area of its own volition (National Oceanic and Atmospheric Administration, National Marine Fisheries Service [NOAA] 2006).

Cultural Resources

A marine cultural resource assessment survey for the project area was conducted in 2020-2021 (SEARCH 2021). One hundred thirty-four magnetic anomalies or anomaly clusters, 13 acoustic contacts, and three acoustic reflectors were detected in the remote sensing record. Three magnetic anomalies were identified as potential submerged cultural resources. Although these three areas are not within the breakwater footprint, they may be in the vicinity of the construction corridor. ANWR is coordinating with the Texas Historical Commission (THC) on the three areas and will work with THC on recommended buffers and impact minimization.

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Draft Environmental Assessment for the Aransas National Wildlife Refuge Dagger Point Coastal and Marine Habitat Protection and Restoration Project

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Table of Contents

Environmental Assessment for Aransas National Wildlife Refuge Dagger Point Coastal and Marine Habitat Protection and Restoration Project

This Environmental Assessment (EA) is being prepared to evaluate the effects associated with this proposed action and complies with the National Environmental Policy Act (NEPA) in accordance with Council on Environmental Quality regulations (40 Code of Federal Regulations [CFR] 1500-1509) and Department of the Interior (43 CFR 46; 516 Departmental Manual 8) and U.S. Fish and Wildlife Service (USFWS) (550 Series - Fish and Wildlife Service Manual 3) regulations and policies. NEPA requires examination of the effects of proposed actions on the natural and human environment (USFWS 2020).

1 Purpose and Need

1.1 Proposed Action

USFWS is proposing to construct a shoreline protection and bluff stabilization project for the eroding shoreline of Aransas National Wildlife Refuge (ANWR) along San Antonio Bay, particularly along Dagger Point (Figure 1). Relative sea level rise, wave impacts, and tropical storms have caused erosion and loss of uplands and marsh along a 5-mile length of the eastern shoreline. The proposed action is to construct a segmented rock breakwater parallel and offshore of the existing shoreline and provide toe protection to stabilize the eroding bluffs.

All structures would be constructed with materials that would better withstand storm impacts and wave energy while protecting coastal habitats. The proposed structures and construction methodologies are proven approaches used in similar environments in Texas and the U.S. Gulf of Mexico coast. A traditional low-crested rubble-mound (rock) breakwater structure is proposed as the conceptual design because it can be efficiently maintained and adapted once it is constructed, compared to other construction materials and methods.

A proposed action is often iterative and may evolve during the NEPA process as the agency refines its proposal and gathers feedback from the public, tribes, and other agencies. Therefore, the final proposed action may be different from the original. The proposed action would be finalized after the public comment period for the EA (USFWS 2020).

1.2 Location

ANWR consists of five units. These units include the Aransas (Blackjack), Tatton, Lamar, Myrtle Foester-Whitmire, and the Matagorda Island units. The proposed project will occur on the eastern

side of the Blackjack Unit on the San Antonio Bay shoreline. The Blackjack Unit is bounded by St. Charles Bay on the west, San Antonio Bay on the east, and the Gulf Intracoastal Waterway along the south. It is 10 miles long northeast to southwest and 2 to 7 miles wide northwest to southeast. No activities are proposed on the other four units and only the Blackjack Unit is described in detail. For further information on the remaining units, please refer to the Aransas National Wildlife Refuge Comprehensive Conservation Plan and Environmental Assessment (CCP) (USFWS 2010).

1.3 Background

National wildlife refuges are guided by the mission and goals of the National Wildlife Refuge System (NWRS), the purposes of an individual refuge, Service policy, and laws and international treaties. Relevant guidance includes the National Wildlife Refuge System Administration Act (NWRSAA) of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997, Refuge Recreation Act of 1962, and selected portions of the CFR and Fish and Wildlife Service Manual (USFWS 2020).

ANWR (Aransas Unit), originally comprising 47,261 acres, was established on December 31, 1937, by Executive Order 7784, *"...as a refuge and breeding ground for migratory birds and other wildlife..."* This acquisition was implemented under the authority of the Migratory Bird Conservation Act of 1929 (45 U.S. Statutes at Large [Stat.] 1222), which also established that ANWR is *"...for use as an inviolate sanctuary...for any other management purposes...for migratory birds..."* (16 United States Code [U.S.C.] § 715d). Additionally, this unit, composed of the Blackjack Peninsula, has a designated proclamation boundary or buffer zone, adding an additional 12,934 acres of jurisdiction over open waters surrounding the peninsula for the protection of waterfowl (Presidential Proclamation No. 2314 [1938], and No. 2478 [1941]). The proclamation boundary (50 CFR, Part 32.8) was established to *"...effectuate the purposes of the Migratory Bird Treaty Act of July 3, 1918...designated as closed area in or on which hunting, taking, capturing or killing...is hereby prohibited*." The ANWR Complex is unique in its representation of four broadly distinct coastal habitats: barrier island, peninsular, coastal upland prairie, and shoreline. With increasingly diminishing habitats along the Texas Gulf Coast, ANWR plays a critical role in coastal habitat preservation and management (USFWS 2010).

The mission of the NWRS, as outlined by the NWRSAA, as amended by the National Wildlife Refuge System Improvement Act (16 U.S.C. 668dd et seq.), is:

> *"to administer a national network of lands and waters for the conservation, management and, where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans."*(USFWS 2010)

The NWRSAA mandates the Secretary of the Interior in administering the National Wildlife Refuge System to (16 U.S.C. 668dd(a)(4)):

•Provide for the conservation of fish, wildlife, and plants, and their habitats within the NWRS;
•Ensure that the mission of the NWRS described at 16 U.S.C. 668dd(a)(2) and the purposes of each refuge are carried out;
•Recognize compatible wildlife-dependent recreational uses as the priority general public uses of the NWRS through which the American public can develop an appreciation for fish and wildlife;
•Ensure that opportunities are provided within the NWRS for compatible wildlife-dependent recreational uses (USFWS 2010).

1.4 Purpose and Need for the Proposed Action

The purpose of this proposed action is to protect the existing shoreline by reducing wave energy and slowing the rate of erosion. The project would also help to preserve the remaining estuarine marsh and coastal bluff habitats and provide opportunities for habitat restoration. Additionally, public access and infrastructure, such as roads, parking areas, and viewing piers would be protected from continued erosion and wave impacts.

The eastern shoreline of the Blackjack Unit along San Antonio Bay is exposed to erosive forces due to water and wind acting on the shoreline. In general, the wave climate in San Antonio Bay consists of locally generated waves that are the result of seasonal wind patterns as well as tropical and extratropical storms. The primary wind and wave direction at the project area is from the southeast. Offshore barrier islands (Matagorda Island and San José Island) play a large role in sheltering San Antonio Bay by reducing wave energy from the Gulf of Mexico.

The project area consists of low-lying coastal marshes, low bluffs between 7 and 9 feet high, and high bluffs (up to 30 feet high) in the vicinity of Dagger Point. The shoreline has been subject to erosional forces and subsequent estuarine habitat shoreline loss that has been documented for several decades. The University of Texas Bureau of Economic Geology (UTBEG; Paine et al. 2016) has mapped coastal erosion rates along the Texas coastline from the 1930s to the 2010s. Using the UTBEG mapping application, the shoreline of ANWR along San Antonio Bay shows shoreline retreat rates of several feet per year in portions of the project area.

Hurricane Harvey made landfall in the project area in 2017, and ANWR staff observed approximately 40 feet of shoreline loss due to that event. In the long-term future, the ANWR shoreline will likely become more vulnerable to erosive forces from low-frequency, high-energy storms as climate change and relative sea level rise increase the intensity of storm events in the Gulf Coast region (Knutson 2020).

This project is needed to ensure ANWR can protect and preserve the resources it is intended to manage. The need for the proposed action is to meet USFWS's priorities as outlined by the NWRSAA and ensure that opportunities are provided for compatible wildlife-dependent recreational uses. This

project advances the missions of both USFWS and the NWRS through the conservation, management, and restoration of fish, wildlife, and plants that have been affected by storm impacts, long-term erosion, and habitat loss. The project also will help ensure that the biological integrity, diversity, and environmental health of the NWRS are maintained for the benefit of present and future generations of Americans (USFWS 2020).

2 Alternatives

2.1 Alternatives Considered

2.1.1 *Alternative A – No Action Alternative*

The current rates of erosion along the eastern shoreline of the Blackjack Unit are expected to increase due to a combination of factors. With continued atmospheric and ocean warming and thermal expansion of ocean waters, sea level rise rates are anticipated to accelerate compared to historic rates (Sweet 2017). The warming climate also increases the likelihood of more intense tropical cyclones such as Hurricane Harvey (Bhatia 2019).

The increasingly deeper waters of San Antonio Bay relative to the existing shoreline of the Blackjack Unit will allow higher wave energy to propagate closer to the existing shoreline and exacerbate the impacts of storm surge. Existing emergent marsh habitat is expected to convert to less productive open water habitat and scarping of the low and high bluffs will continue reducing habitat for migratory birds and other wildlife and aquatic habitat. Public access will be compromised, and ANWR infrastructure will require more maintenance and repair with the potential need to relocate access roads and parking areas.

2.1.2 *Alternative B – Proposed Action Alternative*

Under the Proposed Action Alternative, contractors procured by USFWS would construct a segmented rubble-mound breakwater offshore and parallel to a 5-mile length of the eastern shoreline of the Blackjack Unit and armored structural toe protection constructed at the base of eroding high bluffs with regrading of eroded low bluff scarps (Figures 2-5).

The use of breakwaters is a proven resilient method of shoreline protection that can be efficiently maintained and adapted as needed over time. The use of rock for the structure also provides potential oyster habitat by providing surfaces compatible for larval attachment. The protected areas behind the breakwater may allow for emergent marsh and submerged aquatic vegetation (SAV) habitat expansion and restoration.

The final breakwater design is ongoing. The conceptual design of the breakwater structures includes a maximum crest elevation between +3.0 to +4.0 feet North American Vertical Datum of 1988 (NAVD88) with a crest width of 10 feet (Figure 6). The side slopes of the bayward and landward sides of the breakwater are 5 feet horizontal to 1 foot vertical (5H:1V) The breakwater would be continuous around Dagger Point (Figure 5) but will contain gaps along the northern and southern alignments. The length of each northern and southern breakwater segment is expected to be 200 feet long, and will not exceed 500 feet long, with a gap of around 30 feet from the crest of each subsequent segment to allow for faunal ingress and egress. Each gap will be underlain by a rock sill to prevent scouring. The gap sill elevation will also be determined during final design but is expected to be below the mean lower low water (MLLW) elevation (0.95 feet NAVD 88) at 1.5 to 2 feet above the breakwater base elevation of -1.5 to -2.0 feet MLLW NAVD 88. Buffers of 20 to 30 feet between the breakwaters and any SAV and oyster reefs identified during the SAV and oyster reef survey will be established. Construction access for the offshore breakwaters would be marine-based to minimize impacts to uplands, SAV, and estuarine marsh habitats. A temporary offshore staging area in deeper water would be established for the transfer of equipment and rock material to shallow draft barges.

The bluffs along the project area facing San Antonio Bay are eroding due to wave action at the toe of the bluff where it meets the shoreline and from wind action that mobilizes the unconsolidated sand exposed on the face of the bluffs. Waves that impact the toe of the bluff erode the toe and cause sloughing of the bluff face immediately above this area, further exposing loose sediment. This process manifests as a shearing-off of thin layers of the bluff face, which leaves vertical or extremely steep slopes along the face. The sand that is eroded from the bluff is then transported into the bay. This type of erosion does not allow the bluff to erode to a stable slope. Furthermore, the steep slope and continual erosion also prevents vegetation from taking root on the bluff face.

The preliminary design of the high bluff stabilization component of the project includes the installation of an armored toe to protect 4,200 feet of high bluffs from wave action from the bay (Figure 7). The bluff slope above the toe protection would be allowed to naturally adjust to a stabilized slope angle. Vegetation could then be established on the stable slope through natural recruitment or planting and seeding of desired plant species. Vegetating the slope would reduce erosional forces by reducing the velocity of wind reaching the bluff face surface and allowing the associated root mass to stabilize bluff sediment. A 1,300-foot length of the high bluff shoreline in the immediate vicinity of Dagger Point would be protected by a groin field consisting of a series of groins and breakwaters with sand fill (Figures 8-11). Based on the preliminary design, the groins would extend 150 feet from the shoreline and tie into a series of shore-parallel breakwaters. Up to 15,000 cubic yards of beach sand fill will be placed between the shoreline and breakwaters to an elevation of +3.0 feet NAVD88 and will be obtained either from a commercial sand supplier or from material dredged from the Gulf Intracoastal Waterway (GIWW). Conceptual design of the high bluff

groin field breakwater and groin structures includes a maximum crest elevation of +4.0 feet NAVD88 with a crest width of 10 feet (Figures 10 and 11). The side slopes of the bayward and landward sides of the high bluff protection breakwater and groins would be 3 feet horizontal to 1 foot vertical (3H:1V). The final details of the high bluff protection will be determined during final design after hydraulic modeling of the alternatives and additional input from project stakeholders.

The low bluff design consists of regrading the slope to a more stable profile and vegetating the bluff face. The steepness of the slope gradation will be based on slope stability calculations, aesthetics, and consideration for project area users, since the low bluff areas are more accessible to ANWR visitors.

Depending on the contractor's means and methods and the feasibility of construction, landside access of equipment, materials, and personnel may be used for construction of the high bluff protection and regrading of low bluffs. If needed, upland staging areas and temporary access ramps to the shoreline would be established near the fishing pier located 6,500 feet to the northwest of Dagger Point or from near the observation tower 9,300 feet to the south. Heavy equipment would travel along the beach during low tide periods and mats would be used to minimize impacts to sensitive areas. Reshaping and stabilization of areas affected by construction activities would be performed as part of demobilization activities.

2.1.3 *Alternatives Considered, But Dismissed from Further Consideration*

A range of breakwater configurations and distances from the existing shoreline was evaluated to assess how different geometries and locations may perform under various wave and water level conditions, in regard to wave attenuation. Wave modeling was used to evaluate the wave attenuation performance of various breakwater configurations within the project area under a variety of meteorological conditions ranging from annual return-period winds to hurricane events. Overall, the model evaluation results showed an increase in the breakwater system's effectiveness for attenuating waves near the shoreline as the breakwater alignment was moved closer to shore, gapped portions of the alignment were replaced with continuous (no gaps) segments, sills were placed in the gaps, and a conventional structure type was assumed in lieu of a reef structure type. The proposed alternative design was identified by ANWR staff and project stakeholders as the optimal configuration for providing the highest amount of wave attenuation while avoiding impacts to SAV and oyster reefs and maintaining enough water depth for constructability.

2.2 Mitigation Measures and Best Management Practices

Mitigation measures include:

1. Avoiding impacts by not taking an action or parts of an action;
2. Minimizing impacts by altering or limiting the degree of an action; or

3. Compensating for impacts by repairing, rehabilitating, or restoring the affected environment.

Measures were considered during the development of the proposed alternative to reduce, avoid, or eliminate adverse environmental impacts. Best management practices (BMPs) can include a variety of alternatives that reduce or avoid impacts on resources but still achieve desirable results.

The alignment and footprint of the proposed breakwaters and bluff stabilization measures was selected to provide the greatest amount of shoreline protection while avoiding known SAV and oyster reef locations. The design also incorporated state and federal resource agency representative recommendations that buffers of 20 to 30 feet be established between the breakwater structures and any SAV and oyster reefs identified during the SAV and oyster reef survey.

Construction of the shoreline and bluff protection will be dependent on the chosen contractor's means and methods. Marine-based construction of the offshore breakwaters and bluff protection, if feasible, using shallow draft barges and temporary offshore staging is preferred to minimize impacts to SAV, oysters, emergent marsh, and upland habitats. Land-based access and staging may be needed for construction of the high bluff protection and regrading of the low bluffs if marine-based access is determined to be impractical. If landside access is needed, temporary staging areas and access ramps to the shoreline will be located in upland areas designated to minimize further impacts to the bluffs. Re-shaping and stabilization of areas affected by construction activities would be performed as part of demobilization activities.

2.2.1 *Threatened and Endangered Species Mitigation Measures and BMPs*

All Endangered Species Act (Section 7 Interagency coordination) mitigation measures and BMPs agreed upon in consultation efforts with USFWS's Corpus Christi Ecological Field Office would be strictly administered (USFWS 2020).

2.2.1.1 Whooping Crane Mitigation Measures and BMPs

To minimize disturbance to whooping cranes, construction activities on uplands and the shoreline would need to be regulated between October 30 and April 30. If whooping cranes are observed during construction, crews and equipment will maintain a 1,000-foot buffer from the crane and notify a Service representative. All booms and tall (>20 feet) equipment would be lowered at the end of each workday to minimize crane collision risk (USFWS 2020). If construction activities occur while cranes are on ANWR, BMPs would include arranging for a USFWS representative updating crews on crane activity near work sites as well as access to those work sites.

BMPs would also include equipment traffic and foot activity measures, such as maintaining a 1,000-foot buffer zone from any cranes encountered while accessing work areas or at work sites. Equipment will slow to a stop to allow cranes to move slowly into comfort zones on their own versus

flushing them off-site. Any type of measure that reduces the energy expenditure of cranes would be utilized in the project area to minimize disturbances to cranes (USFWS 2020).

2.2.1.2 Northern Aplomado Falcon Mitigation Measures and BMPs

At this project location, northern aplomado falcons are unlikely to be encountered. However, during the March 15 through June 15 northern aplomado falcon nesting season, a 1,000-foot buffer around nesting sites must be maintained. Equipment operators must proceed slowly and avoid unnecessary stops to minimize disturbance to falcons. If construction occurs in the vicinity of known nesting areas during the nesting season, a biological monitor would accompany work crews and could halt work if a falcon is observed within 1,000 feet of the worksite. Additionally, all booms and tall (>20 feet) equipment would be lowered at the end of each workday to minimize falcon collision risk (USFWS 2020).

2.2.1.3 Migratory Bird Mitigation Measures and BMPs

ANWR is located in the Central Flyway, a route traveled annually by migratory birds and numerous waterfowl. As such, migratory birds are considered to be priority Federal trust species by USFWS on ANWR. If construction activities occur during the breeding season, it is recommended that a qualified biologist complete an assessment in the project area to determine risk to breeding birds. Construction crews should avoid engaging in potentially destructive or disruptive activities in the vicinity of migratory birds to reduce the risk of affecting birds, their nests, or eggs (USFWS 2010).

2.2.1.4 West Indian Manatee Mitigation Measures and BMPs

The endangered West Indian manatee is occasionally documented in the Coastal Bend area but needs further verification within ANWR (USFWS 2010). During in-water work in areas that potentially support manatees, all personnel associated with the project should be instructed about the potential presence of manatees and the need to avoid collisions with and injury to manatees. All work, equipment, and vessel operation should cease if a manatee is spotted within a 50-foot radius (buffer zone) of the active work area. Once the manatee has left the buffer zone on its own accord (manatees must not be herded or harassed into leaving) or after 30 minutes have passed without additional sightings of manatee(s) in the buffer zone, in-water work can resume under careful observation for manatee(s) (USFWS 2013).

2.2.1.5 Sea Turtle Mitigation Measures and BMPs

If a sea turtle is observed within 100 yards of the active construction area or vessel movement, appropriate precautions shall be implemented to ensure its protection. These precautions shall include cessation of operation of any moving equipment closer than 50 feet to a sea turtle. Operation of any mechanical construction equipment shall cease immediately if a sea turtle is seen within a 50-foot radius of the equipment. Activities may not resume until the turtle has left the

project area of its own volition (National Oceanic and Atmospheric Administration, National Marine Fisheries Service [NOAA] 2006).

2.2.2 *Soil Mitigation Measures and Best Management Practices*

Contractors would provide erosion control methods (such as watering dry soils) and structures (such as silt fences and silt curtains) as necessary to prevent wind-borne dust and water-borne silt from leaving the immediate work areas (USFWS 2020).

Additionally, any excavated native topsoil would be stockpiled and reused for reclamation purposes around the construction area. Access points would be designated and flagged to minimize soil compaction. Mats or boards would be used to access equipment during wet conditions to prevent rutting and soil loss (USFWS 2020). Temporary access ramps and staging areas, if needed, will be located in upland areas designated to minimize further damage to the bluffs. Re-shaping and stabilization of areas affected by construction activities would be performed as part of demobilization activities.

Barge traffic that transports crews, materials, and supplies would follow designated routes to avoid scouring and propeller scarring of SAV (e.g., seagrass) in the adjacent bays (USFWS 2020).

2.2.3 *Archeology Mitigation Measures and Best Management Practices*

If paleontological, archaeological, or historical remains (including burials or skeletal material) were encountered, all work would be immediately halted and a construction representative, contracting officer representative, contracting officer or a service representative would be notified. The contracting officer would notify the regional archaeologist, so the provisions of 36 CFR 800.7 and other relevant laws were followed. Work would cease in the immediate vicinity until permitted to resume by written order from the contracting officer. Work in other areas may proceed as approved by the contracting officer (USFWS 2020).

All mitigation measures discussed in consultation with the Texas State Historic Preservation Office in relation to this project would be strictly administered (USFWS 2020).

3 Affected Environment and Environmental Consequences

3.1 Affected Environment

The Aransas NWR comprises just over 116,000 acres of wildlife habitat in Aransas, Calhoun, and Refugio Counties, about 80 miles northeast of Corpus Christi along the Texas Coastal Bend. ANWR's geographically strategic location along the Central Flyway, further enhanced by the convergence of several habitat types and its proximity to the Gulf of Mexico, makes ANWR a major stopover for birds during their fall and spring migration. Waterfowl, shorebirds, raptors, and songbirds are particularly

abundant. The combination of mild winters, abundant food sources, and diverse habitats make ANWR a prime wintering area for many avian species, including the endangered whooping crane. These same features also make Aransas a haven for many other forms of endemic and resident wildlife, ranging from marine to temperate upland and subtropical species (USFWS 2020).

The affected environment under the proposed action is associated with the 5-mile length of the eastern shoreline of the Blackjack Unit on San Antonio Bay. Construction activities would be in an 210-acre area that consists of exposed shoreline, low and high estuarine marsh, SAV, open water, low and high bluffs, and red bay-live oak forest.

Resources potentially impacted by the proposed action and described in detail in this analysis include wildlife and aquatic species, threatened and endangered species, vegetation and habitat, soils, water quality, and air quality.

Resources that would not be impacted by the proposed action and are not analyzed in this EA include geology, water resources, visual resources, and wilderness. There are no designated wilderness areas or wilderness study areas located on ANWR.

3.2 Environmental Consequences of the Action

This section analyzes the environmental consequences of the action on each affected resource, including direct and indirect effects. This EA includes the written analyses of the environmental consequences on a resource only when the impacts on that resource could be more than negligible and therefore considered an "affected resource" or are otherwise considered important as related to the proposed action. Any resources that would not be more than negligibly impacted by the action and have been identified as not otherwise important as related to the proposed action have been dismissed from further analyses (USFWS 2020).

Tables 1 through 5 provide:

4. Descriptions of the affected resources in the proposed action area; and
5. Direct and indirect impacts of the proposed action and any alternatives on those resources,

Impact Types:

- Direct effects are caused by the action that occur at the same time and place.
- Indirect effects are caused by the action that occur later in time or farther in distance but are still reasonably foreseeable.
- Cumulative impacts result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts are the overall, net effects on a resource that arise from multiple actions. Impacts can "accumulate" spatially

when different actions affect different areas of the same resource. They can also accumulate over time from actions in the past, the present, and the future. Occasionally, different actions counterbalance one another, partially canceling out each other's effects on a resource. However, more typically, multiple effects add up, with each additional action contributing an incremental impact on the resource (USFWS 2020).

Appendix 1 lists applicable statutes, executive orders, and regulations relative to these resources and lists steps ANWR would use to comply.

Table 1. Affected Natural Resources with Anticipated Direct, Indirect, and Cumulative Impacts of the Alternatives.

Wildlife and Aquatic Species
About 39 species of mammals, 400 species of birds, and 100 species of reptiles and amphibians are found on ANWR. Coastal wetlands are a vital component of the Gulf Coast fishery and provide a tremendous food source that supports many of the Federal trust species on Aransas NWR. They provide spawning, nursery, and rearing habitat for many wetland and tidal-inlet dependent fish species; more than 20 have significant recreational, commercial, or prey value. The vast majority of these species occur or have the potential to occur on the Blackjack Unit (USFWS 2020). The primary species that have the potential to be affected are species associated with the bay, shoreline, high and low estuarine marsh, and oak-bay forest habitats on the Blackjack Unit. For a complete list of wildlife and aquatic species, please refer to the CCP.
Direct and Indirect Impacts: <u>Alternative A: No Action Alternative</u> Direct and indirect impacts to wildlife and aquatic species are expected to result from continuation of the existing condition. Erosion of ANWR shorelines and habitat loss is expected to continue, but at an increasing rate due to climate change, relative sea level rise, and more intense hurricanes. Direct impacts include the loss of low and high estuarine marsh, SAV, low and high bluffs, and the vegetation communities that occupy those habitats due to ongoing and future wind, wave, and storm effects. Indirect impacts include the effects on the species that inhabit, forage, nest, and breed in those habitats. <u>Alternative B Proposed Action</u> Both direct and indirect impacts to aquatic species are anticipated from the proposed action since the 210-acre project construction area of the proposed action will occur in coastal areas of ANWR. Direct impacts include disturbance and direct mortality of vegetation and less mobile wildlife species from construction activities. Identified SAV beds and oyster reefs will be avoided during construction, but the risk of incidental impacts during construction will be present. Noise and visual disturbances during construction could affect wildlife behavior. As construction progresses along the 5-mile project length, most wildlife should be able to disperse into surrounding areas.

Both direct and indirect impacts to upland species are anticipated from the proposed action since construction of the bluff stabilization component of the proposed action will occur on ANWR uplands adjacent to the shoreline. The affected uplands are classified as an oak-bay forest. Direct impacts include disturbance and direct mortality of vegetation and less mobile wildlife species from construction activities. Noise and visual disturbances during construction could affect wildlife behavior. As construction progresses along the 5-mile project length, most wildlife should be able to disperse into surrounding areas.

Construction may occur over multiple phases as funding becomes available and/or due to construction windows to avoid undesired tide conditions for marine-based construction of the breakwater structures. Should land access be required for bluff stabilization construction, then low tides may be desired. The cumulative duration of on-site construction activities could extend from 12 to 24 months.

Construction activities would include use of heavy equipment, machinery, and labor to construct the proposed action. Impacts to bay bottom habitats will be minimized by avoiding known oyster, SAV, and emergent marsh areas. Temporary access ramps and staging areas, if needed, will be located in upland areas designated to minimize further damage to the bluffs. Re-shaping and stabilization of areas affected by construction activities would be performed as part of demobilization activities. Marked equipment access corridors, marsh mats, and floating sectional platforms will be used to limit impacts to bay bottom and nearshore areas. Disturbance by vessel traffic, foot traffic, and construction equipment operations have the potential to flush birds and wildlife. Sufficient nearby habitat is available to provide security to displaced wildlife in the vicinity

Threatened and Endangered Species and other Special Status Species

Fourteen threatened or endangered species may occur on ANWR, with many of the habitat management activities focused on the whooping crane. Other federally listed threatened or endangered species that may be found locally in suitable habitat, incidentally or otherwise, include the Kemp's ridley sea turtle (endangered), loggerhead sea turtle (threatened), green sea turtle (threatened), hawksbill sea turtle (endangered), leatherback sea turtle (endangered), piping plover (threatened), Black Rail (threatened), rufa red knot (threatened), and aplomado falcon (endangered) (USFWS 2010). Of the threatened and endangered species on ANWR, the whooping crane and the northern aplomado falcon have the greatest potential to be affected by the proposed action. The endangered West Indian manatee is occasionally documented in the Coastal Bend area but needs further verification within ANWR. Additionally, sea turtles are known to occur in bay waters. The highly endangered Attwater prairie chicken is no longer found in the area. Other endangered mammals reported include the ocelot and jaguarundi, neither of which has been documented on ANWR (USFWS 2010). For a

complete register of listed species, special status species, and general wildlife. please refer to the CCP (USFWS 2020).

Whooping Crane

The flagship endangered species at Aransas NWR is the whooping crane, one of the first species listed as endangered per the Endangered Species Act of 1973. Historical records indicate that whooping cranes have been known to winter on and around ANWR since at least the early 1900s, prior to refuge establishment. The entire Aransas-Wood Buffalo flock, the last wild flock of whooping cranes in the world, is dependent on this part of the Texas coast during the winter months. The project area is the nearshore and adjacent San Antonio Bay shoreline in the Blackjack Unit. In this area, cranes are occasionally visible in the marsh habitat next to the bay (USFWS 2020).

Whooping Crane Critical Habitat

Whooping Crane critical habitat designation includes most of the Aransas NWR; however, the official designation from 1978 states that it is "exclusive of those existing manmade structures or settlements which are not necessary to the normal needs or survival of the species." The project area is within designated critical habitat for whooping cranes. Whooping cranes are territorial birds and each pair requires several hundred acres of undisturbed wetlands in and around ANWR. Unmated sub-adults also require some suitable habitat that is not regularly defended by the paired cranes. ANWR still has many acres of suitable habitat classified as critical habitat for additional cranes and sub-adults to disperse (USFWS 2020).

Northern Aplomado Falcon

Northern aplomado falcons were released by the Peregrine Fund, Inc., on Matagorda Island and the Tatton Unit of the Aransas NWR in 1999, to help with the recovery of the species. The Peregrine Fund discontinued releases in 2003 because the habitat available for northern aplomado falcons was saturated on ANWR. Nest depredation negatively influenced the efforts on the Tatton unit, but all 13 nesting sites on Matagorda Island were eventually occupied. After Hurricane Harvey, only 6 nesting sites were used. Northern aplomado falcons are continually monitored as part of their recovery plan. There is no critical habitat designation on ANWR for the northern aplomado falcon (USFWS 2020).

Sea Turtles

The Kemp's ridley, loggerhead, hawksbill, green, and leatherback sea turtles occur within the Gulf of Mexico and may also occur within bay waters. Beginning in 2005, the first known nesting

by Kemp's ridley sea turtles was documented on Matagorda Island, and since then, nesting numbers have been steadily increasing (USFWS 2021). Kemp's ridley and green sea turtles are known to forage on seagrasses in Texas bays from Matagorda Bay to Laguna Madre (Valverde 2017). There is no critical habitat designation on ANWR for any of the five species of sea turtles.

Marine Mammals

The endangered West Indian manatee is occasionally documented in the Coastal Bend area but needs further verification within ANWR (USFWS 2010). Although manatees may not be common to ANWR, the project area consists of habitat similar to areas in the Coastal Bend region where manatees have been sighted. There is no critical habitat designation on ANWR for manatees.

Three species of dolphins have been documented at ANWR on or near Matagorda Island (USFWS 2010); these include Risso's Dolphin, Bottlenose Dolphin, and Clymene Dolphin. There is no critical habitat designation on ANWR for dolphins.

Direct and Indirect Impacts:

Alternative A: No Action Alternative

Direct and indirect impacts to threatened and endangered species, critical habitat, or special status species are expected to result from continuation of the existing condition. Erosion of ANWR shorelines and habitat loss is expected to continue, but at an increasing rate due to climate change, relative sea level rise, and more intense hurricanes. Direct impacts include the loss of low and high estuarine marsh, low and high bluffs, and the vegetation communities that occupy those habitats due to ongoing and future wind, wave, and storm effects. Indirect impacts include the effects on the species that inhabit, forage, nest, and breed in those habitats.

Alternative B: Proposed Action Alternative

Short-term direct impacts could occur on listed species but long-term benefits are expected to result from the proposed action. Direct effects that may temporarily disturb and displace listed species could occur from construction activities including noise and visual disturbances from vessel traffic, heavy equipment working in construction areas, and activities of construction crews in and around the project area.

Construction activities would occur within a 210-acre footprint in and adjacent to the nearshore coastal area. Cranes have been observed feeding and loafing in marsh areas in the proposed construction area. Feeding activities of the cranes could be temporarily affected by the proposed construction activities (USFWS 2020).

The West Indian Manatee, three species of dolphins, and five species of sea turtles are known to occur in the surrounding area (USFWS 2010).

No long-term, indirect impacts on listed species are associated with the proposed action because cranes, manatees, dolphins, and sea turtles have the ability to disperse to nearby similar habitats. Listed species are anticipated to use the project area after construction is completed.

Northern aplomado falcons are extremely mobile and can readily relocate to suitable habitat. No impacts on nesting falcons are anticipated from the proposed action since nesting has not occurred in the immediate vicinity of the project area. Other activities that falcons could engage in at the project site include hunting, resting, and perching. Aplomado falcons have suitable nesting, feeding, and resting areas throughout ANWR and if falcons were observed near the construction areas or on access roads leading to the project sites, mitigation measures would be initiated to reduce disturbance to falcons (USFWS 2020).

Direct effects on special status species in construction sites may include mortality of less mobile animals as well as temporary displacement by noise, equipment operation, and other human-induced disturbances in construction areas. Sufficient habitat is available in the immediate vicinity of the project areas to provide dispersal areas to wildlife-affected construction activities (USFWS 2020).

The majority of ANWR, including the project area, is designated as critical habitat. The official designation from 1978 states that the designation is "exclusive of those existing manmade structures or settlements which are not necessary to the normal needs or survival of the species." These "manmade structures" included the proposed breakwater and bluff stabilization structures the proposed action is attempting to construct. These structures will not be "necessary to the normal needs or survival of the species" and will not affect critical habitat designation or elements (USFWS 2020). Under Alternative B, seasonal restrictions, mitigation measures, and BMPs would be put into place to minimize disturbances to listed species. In addition to mitigation measures, there is sufficient habitat available in the immediate vicinity of the project areas to provide sanctuary for listed species from disturbances (USFWS 2020).

Vegetation and Habitat

ANWR consists of a wide variety of habitat types ranging from coastal to upland grasslands. The proposed action would take place on a 210-acre footprint in the nearshore tidal flat coastal and adjacent upland area of the Blackjack Unit. The location for the proposed action on the Blackjack Unit is classified as a tidal flat/pool community (salt marsh community), the tidal shore grassland (marshhay cordgrass and Gulf cordgrass communities), and the ridge and swale community on the low and high elevation bluffs (USFWS 2010).

The primary floral components of the tidal flat/pool community include smooth cordgrass, maritime saltwort, wigeongrass, shoal grass, saltgrass, seashore dropseed, bushy sea oxeye, sea lavender, camphor daisy, shore grass, Gulf cordgrass, sumpweed, groundsel, mesquite, and Texas prickly pear. Specialized components include blue-green algal mats, which are a mix of algae, diatoms, protozoa, and bacteria. The marshes, tidal flats and shallow tidal pools provide feeding, loafing, and roosting areas for many shorebirds, herons, egrets, cranes, and waterfowl (USFWS 2010).

Common fauna in the tidal flat/pool community include detritivores—marine worm, clam, ghost shrimp, and many tiny crustaceans; grass shrimp, juvenile brown shrimp, pistol shrimp, blue crab, marsh crab, mud crab, stone crab, hermit crab, marine snails, striped mullet, and killifish; shore flies, shore bugs, beach flea, fiddler crab, shorebirds, waders, herons and egrets, gulls, terns, black skimmer, clapper rail, seaside sparrow, Gulf saltmarsh snake, saltmarsh grasshopper, marsh rice rat, western pygmy blue and great white southern butterflies, tiger beetles, wolf spider, rice rat, raccoon, feral hog; and white-tailed deer. Rare and uncommon flora and fauna include black mangrove, wood stork, diamondback terrapin turtle, white mullet, blue crab, and the federally endangered whooping crane (USFWS 2010).

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The tidal shore grassland community is the gently sloped linear stretch of land found just inland from the tidal flat/pool community. It is densely covered with marshhay cordgrass and rimmed with Gulf cordgrass and bluestems along the upper edge. The Gulf cordgrass component occurs on saline clay soil types and may also include bluestems. Tidal shore grassland occurs on all units of ANWR along with the Gulf Cordgrass Community. Its open aspect and heavy rodent population appeal to a variety of raptors, including the white-tailed hawk, white-tailed kite, northern harrier, and loggerhead shrike. Also found here are a variety of sparrows, sedge wren, hispid cotton rat, pygmy mouse, racers, and coachwhip snake (USFWS 2010).

The topography of the ridge and swale community is a result of sand deposition due to wind and wave action that created the Ingleside Barrier similar to that of modern barrier islands. On the Blackjack Peninsula, the sandy ridges provide the elevation required for woody perennials to survive being flooded. The frequently flooded sandy swales grow an assortment of annuals and water tolerant herbaceous perennials (USFWS 2010).

The flora of the oak mottes and woodlands of the ridge and swale community is dominated by live oak, laurel oak, redbay, and lime prickly ash. The understory supports yaupon, greenbrier, and beautyberry. Mustang grape is also usually found growing among the trees. This habitat offers

wintertime cover and summertime shade for a variety of wildlife. The live oak thicket portions of the ridge and swale community is composed of mostly dense stands of live oak shoots. The grasslands are dominated by an array of mid- and tall-perennial bunchgrasses, the likes of which are rarely seen outside ANWR. Primary floral components include bushy bluestem, broomsedge, seacoast bluestem, silver bluestem, big bluestem, and others. These are joined by switchgrass, dropseeds, Gulf muhly, paspalums, sprangletops, and Indiangrass. Sawgrass, rattlepod, bulrushes, and sedges can be found in areas where water accumulates (USFWS 2010).

Direct and Indirect Impacts:

Alternative A: No Action Alternative

Direct and indirect impacts to vegetation and habitats are expected to result from continuation of the existing condition. Erosion of ANWR shorelines and habitat loss is expected to continue, but at an increasing rate due to climate change, relative sea level rise, and more intense hurricanes. Direct impacts include the loss of low and high estuarine marsh, low and high bluffs, and the vegetation communities that occupy those habitats due to ongoing and future wind, wave, and storm effects. Indirect impacts include the effects on the species that inhabit, forage, nest, and breed in those habitats. Indirect impacts also include continued erosion of soil and landmass, which would eventually impact access roads, pedestrian paths, and overall public access.

Alternative B: Proposed Action Alternative

Under the proposed Alternative B, minor short- and long-term impacts to vegetation and habitats are anticipated from the proposed action within the 210-acre project construction area in the tidal flat/pool, tidal shore grassland communities. Direct impacts include destruction of native habitat due to construction equipment operation. Identified SAV beds and emergent marsh will be avoided during construction, but the risk of incidental impacts during construction will be present. Noise and visual disturbances during construction could affect wildlife behavior. As construction progresses along the 5-mile project length, most wildlife should be able to disperse into surrounding areas. Long-term direct and indirect beneficial effects on vegetation and habitats from the proposed action are anticipated after construction based on the amount of ANWR habitat protection and restored.

Table 2. Affected Physical Resources with Anticipated Direct, Indirect, and Cumulative Impacts of the Alternatives.

Soils
The soils of the Texas coastal prairie and marsh are characterized by vertisols, mollisols, alfisols, and entisols at their broadest levels (Godfrey et al., 1973). For additional information on soils, please refer to the CCP. The soils in the project area are in the Galveston-Mustang-Dianola soil association. These soils are nearly level to undulating, rapidly permeable, non-saline to extremely saline, sandy soils in low coastal areas (USFWS 2020).
Direct and Indirect Impacts: Alternative A: No Action Alternative Direct impacts to soils are expected to result from the existing condition. Erosion of ANWR shorelines is expected to continue, but at an increasing rate due to climate change, relative sea level rise, and more intense hurricanes. Direct impacts include the loss of sediment due to ongoing and future wind, wave, and storm effects. Indirect impacts include continued erosion of soil and landmass, which would eventually impact access roads, pedestrian paths, and overall public access. Alternative B: Proposed Action Alternative Under the proposed Alternative B, minor short- and long-term impacts to soils are anticipated from the proposed action within the 210-acre project construction area in the tidal flat/pool, tidal shore grassland communities. Direct impacts include damage to soils due to construction equipment operation. Long-term benefits to soils from the proposed action are anticipated after construction due to the erosion protection provided by the proposed structures.
Air Quality
The U.S. Environmental Protection Agency monitors air quality through a scale known as the Air Quality Index. This scale is based on the National Ambient Air Quality Standards (NAAQS). ANWR is located in a remote area along the South Texas Gulf Coast about 40 miles from Victoria and 80 miles from Corpus Christi, Texas. The entire Texas Coastal Bend area from Victoria south to the Lower Rio Grande Valley is included in the near-nonattainment standard for all atmospheric pollutants including ozone, sulfur dioxide, and hydrogen sulfide, as specified by federal air quality regulations (USFWS 2020). The greatest air quality concern comes from the petrochemical industry, regulated by the Texas Commission on Environmental Quality (TCEQ), which sets standards along with the U.S. Environmental Protection Agency (EPA). Infrequent construction activities occur on the Complex and can generate temporary dust (USFWS 2020).

Direct and Indirect Impacts:

Alternative A: No Action Alternative

No impacts on air quality are expected from the continuation of current condition.

Alternative B: Proposed Action Alternative

The proposed action could result in direct short-term impacts to air quality during construction. The sources of these impacts are associated with the use of heavy equipment for construction and vessels used to move rock, equipment, and personnel. Direct impacts to air quality are based on emissions from vessels such as tow boats and air boats and construction equipment such as excavators, dozers, and loaders. Air quality associated with the proposed action is not expected to have any measurable changes and is not expected to contribute to measurable negative impacts on air quality.

Water Quality

Water resources on Aransas NWR are primarily managed with infrastructure (dams, impoundments, and levees) to allow for the maintenance of reservoirs, flooding of rice fields, and movement of water. ANWR is authorized to divert and use water not to exceed 7,685 acre-feet per year to fill the reservoirs for the operation and maintenance of ANWR and recreational purposes. Water quality has been tested periodically at various locations on ANWR, and harmful levels of contaminants such as agricultural chemicals are not significant. However, ANWR periodically tests water quality, particularly at wetlands frequented by migratory birds, to address any potential concerns (USFWS 2020).

Floods commonly occur during summer precipitation events. Human alterations along the floodplains associated with building of roads and other infrastructure and changes or complete removal of native vegetation have reduced the capacity of the natural systems to slow and store floodwaters. There are no managed water resources in any of the project footprints (USFWS 2020).

Direct and Indirect Impacts:

Alternative A: No Action Alternative

Impacts on water quality from the continuation of current condition are associated with increased turbidity caused by the movement of sediment into the water column from erosion of the shoreline and bluffs. Some coastal erosion is normal; however, excessive erosion leads to increased saltwater turbidity, diminished water quality, and the loss of sediments. The loss of sediments translates into the loss of habitat. Once these sediments have reached the Gulf of Mexico, recovery is unlikely and expensive.

Alternative B: Proposed Action Alternative

The proposed action could result in direct short-term impacts on saltwater quality during construction of the project. The source of these impacts are associated with the use of heavy equipment for construction and vessels used to move rock, equipment, and personnel. Direct impacts to water quality are based on turbidity generated from vessels such as tow boats and air boats and construction equipment such as excavators, dozers, and loaders. Water quality associated with the proposed action is not expected to have any measurable changes and is not expected to contribute to measurable negative impacts on air quality. No direct impact to freshwater quality is anticipated with the proposed action.

Table 3. Affected Visitor Services with Anticipated Direct, Indirect, and Cumulative Impacts of the Alternatives

Visitor Services
ANWR provides the six priority public uses of the NWRS (including hunting, fishing, wildlife observation and photography, and environmental education and interpretation) that are compatible with refuge purposes and the NWRS mission. In addition, three approved secondary uses occur: picnicking on the Blackjack Unit, beachcombing (which includes swimming and picnicking), and camping on Matagorda Island. Bicycling also occurs but only as an incidental public use on the auto tour loop on the Blackjack Unit and Matagorda Island. There are no special accommodations provided for this type of use. For a detailed analysis of all public-use activities on ANWR, please refer to the CCP (USFWS 2010). ANWR has been identified as one of the top 10 places in the nation for watching wildlife. It is the wintering home of the endangered whooping crane, attracts over 65,000 visitors each year from all over the world, and is a critical economic driver for local communities. The Rockport Chamber of Commerce in Texas estimates that whooping crane-related activities result in annual gross economic benefits of $6 million to the local economy. Birders from across the country and international visitors visit ANWR annually with peak visitation occurring during the whooping crane wintering season (USFWS 2010).
Direct and Indirect Impacts: <u>Alternative A: No Action Alternative</u> Under the no action alternative, there would be negative indirect impacts on priority wildlife-dependent public uses on ANWR. Continued erosion and habitat loss could affect the visitor experience through the possible loss of road access and facilities supporting public use along this shoreline. <u>Alternative B: Proposed Action Alternative</u> Under the proposed action, short-term indirect impacts to some of the wildlife-dependent public uses on ANWR would occur due to portions of the construction area being restricted from fishing, hunting, and wildlife observation to ensure public safety. Long-term beneficial impacts would occur on ANWR from the proposed action. Visitor uses would be enhanced by protecting the resources and habitats enjoyed by the public to provide a positive visitor experience. Slight improvements and efficiencies are built into the new designs to withstand future weather events as well as to improve visitor experience. Efficiencies in public use infrastructure should return visitation to pre-hurricane numbers with the possibility of a slight increase. Public access would be

reestablished to the construction area to restore the six priority public uses of the NWRS to the project site.

Table 4. Affected Cultural Resources with Anticipated Direct, Indirect, and Cumulative Impacts of the Alternatives

Cultural Resources
ANWR has been inhabited by native peoples for thousands of years. Artifacts from the area suggest that the earliest humans arrived between 6,000 to 8,000 years ago. They hunted bison and mammoths. About 4,000 years ago, a culture of people known as the "Aransas" inhabited areas from around Copano Bay south to Baffin Bay. They were nomadic hunter-gatherers and apparently left the Gulf Coast at about 1200 to 1300 A.D., leaving little trace of their lifestyle, other than some shell tools and spear points, reflecting a culture adapted to the bays. North of Aransas, in neighboring Calhoun County, Karankawa Indians occupied Matagorda Bay and Matagorda Peninsula, and moved down the Coastal Bend around 1400 A.D. in areas previously occupied by the Aransas. Karankawas populated the shoreline and wandered about the area, leaving behind evidence of their existence (USFWS 2020). The most current cultural resources survey was conducted in 1994 on the Blackjack and Live Oak Peninsulas and the Tatton unit (USFWS 2020). A marine cultural resource assessment survey for the project area was conducted in 2020-2021 (SEARCH 2021). One hundred thirty-four magnetic anomalies or anomaly clusters, 13 acoustic contacts, and three acoustic reflectors were detected in the remote sensing record. Three magnetic anomalies were identified as potential submerged cultural resources.
Direct and Indirect Impacts: <u>Alternative A: No Action Alternative</u> No manufactured impacts to cultural resources are expected from continuation of the current condition. However, accelerated erosion along the ANWR shoreline would continue to expose artifacts currently preserved and protected by USFWS policy to remain in place. <u>Alternative B: Proposed Action Alternative</u> Under Alternative B, no impacts to cultural resources are anticipated. Demolition activities and reconstruction efforts are in the same footprint as remaining infrastructure. The marine cultural resources survey that was conducted in 2020-2021 identified three magnetic anomalies that could potentially indicate submerged cultural resources. Although, these three areas are not within the

breakwater footprint, they may be in the construction corridor. ANWR is coordinating with the Texas Historical Commission (THC) on the three areas and will work with THC on recommended buffers and impact minimization.

Table 5. Affected Socioeconomic Resources with Anticipated Direct, Indirect, and Cumulative Impacts of the Alternatives

Socioeconomics
Local and Regional Economics Aransas, Calhoun, and Refugio Counties are rural, with their economies based mostly on farming, ranching, chemical industries, fishing, and tourism. Historically, the three counties were a sparsely settled area of huge cattle ranches, but early in the 20th century, the immense ranches began to break up, and in 1909, organized farming was introduced to this area of the Gulf Coast. Farming and agribusiness have remained the mainstay of the area. One of the largest single industries in the area is chemical manufacturing, primarily in Calhoun County (USFWS 2020). Aransas NWR, wintering home of the endangered whooping crane, attracts over 65,000 visitors each year from all over the world and is a critical economic driver for local communities. Hurricane Harvey, which significantly impacted the area in 2017, has had a drastic impact on socioeconomics throughout the region (USFWS 2020). Impacts of Hurricane Harvey not only interrupted visitor services and everyday management of ANWR, but also affected the oil and gas production in tri-county region. Hilcorp Inc. holds the primary mineral lease on ANWR. Hilcorp maintains access roads, pipelines, gravel pads, electrical lines, storage tanks, separating facilities, and compressor stations on ANWR in support of its oil and gas production activities. This entire infrastructure was damaged by the hurricane. In addition, a right-of-way pipeline easement for off-refuge oil and gas activities runs through ANWR. This operation includes storage tanks and separating facilities. Oil and gas revenues for Aransas County totaled $43.5 million for 16 active gas wells and one active oil well in 2016. Currently, there are 10 active gas wells and two active oil wells on Aransas NWR (USFWS 2020).
Direct and Indirect Impacts: <u>Alternative A: No Action Alternative</u> Under the no action alternative, there would be negative indirect impacts on socioeconomics at the local level. Continued erosion and habitat loss could affect priority wildlife-dependent public uses on ANWR and increase damage to infrastructure.

Alternative B: Proposed Action Alternative

Under the proposed action, protection and restoration of ANWR habitats would benefit socioeconomics for the entire region. The proposed alternative would have beneficial direct and indirect impacts at both the local and regional level. By enhancing priority uses and visitor experience, ANWR generates revenue for the local economy. The proposed alternative would restore and enhance habitats conducive to priority uses. With limited types of outdoor recreation available to the public in this area, protecting and restoring habitats to ANWR would be essential to increasing fishing, hunting, and ecotourism on ANWR. Increased capacity and improved access would support recent economic data for ANWR that estimates visitors contributed $6 million in tourism revenue to the Rockport-Fulton economy. Construction activities could also have beneficial economic impacts in the local area if supplies were purchased and equipment was rented in neighboring communities.

Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high or adverse human health or environmental effects of agency programs and policies on minorities and low-income populations and communities (USFWS 2020).

USFWS has not identified any potential high and adverse environmental or human health impacts from this proposed action or any of the alternatives. USFWS has identified no minority or low-income communities within the impact area. Minority or low-income communities would not be disproportionately affected by any impacts from this proposed action or any of the alternatives (USFWS 2020).

Indian Trust Resources

DOI Environmental Compliance Memorandum 97-2 requires that all agency environmental assessments must address explicitly whether any Indian Trust Resources may be impacted by the action (USFWS 2020).

No Indian Trust Assets have been identified in the three-county area ANWR is contained within, which include Aransas, Calhoun, and Refugio Counties. There are no reservations or ceded lands present. Some archaeological resources exist on ANWR and are preserved in place by stabilization of the surrounding soils or protected by restricting human use. No significant impacts are anticipated from the implementation of this project as described in the EA (USFWS 2020).

Irreversible and Irretrievable Commitment of Resources
Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that this use could have on future generations. Irreversible effects primarily result from the use or destruction of specific resources that cannot be replaced within a reasonable period, such as energy or minerals. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored because of the action, such as the extinction of a threatened or endangered species or the disturbance of a cultural resource (USFWS 2020). None of the alternatives would result in a large commitment of nonrenewable resources. Project implementation would require the irretrievable commitment of fossil fuels (diesel and gasoline), oils, and lubricants used by heavy equipment and vehicles. In addition, management actions in this document would require a commitment of funds that would then be unavailable for use on other Service projects. At some point, the commitment of funds to these projects would be irreversible, and once used, these funds would be irretrievable. USFWS would implement BMP to minimize potential impacts (USFWS 2020).

3.3 Cumulative Impact Analysis

Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR 1508.7) (USFWS 2020).

TABLE 6. Anticipated Cumulative Impacts of the Proposed Action and Any Alternatives

Other Past, Present, and Reasonably Foreseeable Activity Impacting Affected Environment	Descriptions of Anticipated Cumulative Impacts
Refuge Activities Past, present, and foreseeable future area impacts from land use activities include ground-disturbing activities such as demolition and construction, both on and off ANWR. Erosion on ANWR occurs mostly when roads are built or when land is cleared of its vegetation.	Impacts to soils from construction-related ground-disturbing activities include erosion, sedimentation, scouring, and nutrient loss. The proposed action could result in incremental impacts that could contribute to—but would not substantially change—the impacts that are already occurring to soil resources.

Prescribed burning also has occurred and continues to occur on both ANWR and adjacent lands but typically only in low or no wind conditions (USFWS 2020). Ongoing activities within the project area such as farming, prescribed burning, and managing exotic vegetation that occurs in and around ANWR do not approach compromising the Endangered Species Act when included with the proposed action (USFWS 2020). Some past, present, and reasonably foreseeable future ANWR activities (i.e., construction, herbicide spraying, flooding of croplands, and oil and gas development and extraction) may affect water quality. Water quality is also affected by local landowner use of fertilizer and herbicide and by increasing development along the coast (USFWS 2020). *Surrounding Land Use* Currently, smog or other air quality issues are not a large concern, as ANWR is about 40 miles from Victoria and 80 miles from Corpus Christi, Texas. There is also the use of water wells outside of ANWR, and use is likely increasing. Freshwater inflows come into the bays surrounding ANWR. These freshwater inflows, a major habitat component for some sea life (such as the blue crab) are controlled by river authorities upstream from ANWR. ANWR also experiences water contaminants and occasional oil spills that affect Matagorda Island, but Refuge staff is prepared for them with containment booms. Facilities such as the Chaparral and Exxon petrochemical operations that exist	All construction activities would occur within the 210-acre footprint of the proposed breakwaters and bluff stabilization structures. The proposed action would reduce the impact of wind, wave, and storm erosion on the San Antonio Bay shoreline of the Blackjack Unit. The proposed action does not contribute to cumulative impacts on natural resources when added to other past, present, and reasonably foreseeable future actions. The impact to water quality from the amount of fertilizer and herbicide contributed by ANWR is negligible and temporary (USFWS 2020). The greatest air quality concern comes from the petrochemical industry, regulated by the TCEQ, which sets standards, along with the EPA. However, air quality could be affected when the wind blows toward ANWR. A proposed power plant is being considered outside of Victoria, which may cause additional impacts to air quality. Other facilities, such as the Chaparral and Exxon petrochemical facilities, exist immediately outside of ANWR and may cause adverse air quality impacts (USFWS 2020). The proposed action is not anticipated to contribute to the impacts from land use activities of the surrounding areas. Ongoing activities within the project area under the proposed action do not approach

immediately outside of ANWR can contribute to water quality impacts (USFWS 2020). The State of Texas General Land Office manages waters and marshes surrounding ANWR. Cedar Bayou on the Matagorda Island unit is dredged on occasion depending on environmental needs. The dredging helps maintain the natural inflow and outflow of marine tides, which helps maintain the healthy bay ecosystem. If this area is not dredged from time to time, the exchange between gulf waters and bay waters that some species depend on is not allowed. Marine invertebrates are then affected, which in turn affects migratory birds (USFWS 2020). There are no known foreseeable activities adjacent to ANWR that would significantly alter existing conditions, affect life history requirements of local wildlife, or have negative repercussions on natural resources or designated critical habitat. Countywide burn bans are implemented occasionally but largely under unfavorable weather conditions. Effects from other ground-disturbing activities off ANWR are likely to remain consistent with pre-Hurricane Harvey levels (USFWS 2020).	compromising the Federal Clean Air Act, or the Clean Water Act, nor will they incrementally add to the impacts from nearby power plants, petrochemical facilities, wells, and dredging activities occurring in nearby areas (USFWS 2020).
Development and Population Increase Aransas, Refugio, and Calhoun Counties are rural with economies based mostly on farming, chemical industries, fishing, and tourism (USFWS 2020). The local economy has suffered for a variety of reasons after Hurricane Harvey and all surrounding communities support reestablishing infrastructure on ANWR in an attempt to revitalize tourism and to	ANWR beneficially affects the surrounding local area by providing jobs, contributing to the ecotourism industry, allowing for payments to counties or surrounding local governments through the Payments In Lieu of Taxes program, and revenue sharing. Most ANWR employees live in the surrounding towns, including Austwell, Rockport, and Fulton. Inevitably, some of their income is reinvested into the local economy. Recreation and associated

help stimulate the local economy in the tri-county region (USFWS 2020). According to the Economic Development Council, Aransas County (2016), Rockport and Fulton's primary industry is tourism. Hosting nearly one million annual visitors, the Rockport-Fulton area successfully supported more than 25 hotels and 40 RV parks, over 30 restaurants, a wide variety of events, more than 20 local attractions, and a diverse group of merchants and specialty shops. Aransas County spending by tourists has totaled more than $100 million annually (USFWS 2020). The amount of ground being disturbed could increase into the future on lands surrounding ANWR as population and associated developments increase (USFWS 2020). Total economic impacts of marine recreational fishing in the San Antonio Bay System were estimated at 206 jobs, $7.6 million in labor income, $11.6 million in value-added (contribution to Texas GDP), and $20.7 million in output (sales value of goods and services). Total annual economic impacts of marine recreational fishing in the Aransas Bay System estimated 638 jobs, $23.2 million in labor income, $35.7 million in value-added (contribution to Texas GDP), and $63.3 million in output (sales value of goods and services). The commercial catch for the Rockport area (all species) averaged 3.8 million pounds valued at $9.5 million, and catch for Port Lavaca/Port O'Connor area (all species) averaged 4 million pounds valued at $6.9 million (USFWS 2020).	spending indirectly benefit support services, such as hotels and restaurants, which also benefits the local economy (USFWS 2020). Cumulative impacts on socioeconomics would be beneficial under the proposed action by returning tourism to the region. The proposed action would bring back visitor services activities and once again attract visitors from around the world into the region to enjoy our natural resources. It would help bring back these opportunities to pre-hurricane levels with a possibility of a slight increase due to the efficiencies in administration and visitor services that are anticipated with the newly designed infrastructure (USFWS 2020).

Visitor Services ANWR provides opportunities for the public that are somewhat rare in the State of Texas, as most of the state is privately owned. There are also some opportunities for recreational fishing, swimming, camping, and hiking in surrounding State Parks and other national wildlife refuges. Due to the limited availability of public-use lands, however, these lands, and in particular the Aransas NWR, are treasured and depended upon to provide recreational and scenic amenities. The proposed action would return these opportunities to the area (USFWS 2020). Near ANWR, ranching (grazing and/or livestock production, game management, and hunting) and farming on private lands are major land uses. In the surrounding bays, recreational and commercial (finfish, oyster, crab, and shrimp) fishing in state waters is the primary activity. During the fall and winter, waterfowl hunting is also a significant activity in state waters. Oil and gas production on both land and water is an ongoing activity. Other recreational activities include bird watching, sightseeing, and photography by chartered boats and recreational boaters (USFWS 2020). Oil and gas production is present in the surrounding waters and on the northeast boundary of the Island. Pass Cavallo provides access to offshore oil and gas developments, deep-sea fishing, and commercial fisheries. Pass Cavallo is also a significant attraction for beachgoers, and for picnicking, camping, and fishing. On the southwest boundary, about 40 miles down the coast, Cedar Bayou Pass is an attraction for beachgoers, and for	Cumulative impacts from administration, public use, and recreation would be beneficial under the proposed action due to the lack of existing recreational fishing, hunting, and ecotourism opportunities in the local area and the loss of these activities on ANWR due to wind, wave, and storm impacts. The proposed action would help to restore priority uses and bring back visitor services and rejuvenate ecotourism in the region (USFWS 2020). There are no foreseeable activities adjacent to the project area that would significantly alter existing conditions or affect visitor services. This analysis considers the cumulative impacts of the proposed action in combination with other projects or management activities. There are no known state or federal actions (past, present, and reasonably foreseeable) occurring in the vicinity of ANWR or proposed in the future that could have potential cumulative impacts on visitor services when added to the impacts of the proposed action (USFWS 2020).

picnicking, camping, and especially for fishing (USFWS 2020).	
Climate Change Climate change is expected to affect ecosystems in a variety of ways. These impacts may include species range shifts, plant/vegetative community shifts, species extinctions, phenological changes, and increases in primary productivity. Another concern for coastal lands, including the Aransas NWR, is rising sea levels due to thermal expansion and melting glaciers. Impacts of sea-level rise can include inundation of coastal wetlands, increased salinity of coastal wetlands, increased flooding or storm surges, and shoreline erosion (USFWS 2020).	ANWR may be a minor contributor to climate change; however, the benefit it provides in keeping land in a predominantly natural or undeveloped state far outweighs the impact. The proposed action may help educate the public on the benefits ANWR provides to help address challenges related to climate change. Therefore, no negative cumulative impacts on climate change are anticipated with the proposed action (USFWS 2020).

3.4 Summary of Analysis

The purpose of this EA is to provide sufficient evidence and analysis for determining whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI).

3.4.1 *Alternative A – No Action Alternative*

The no action alternative would not meet the purpose and need of USFWS to provide the current level of managed resources to ANWR and facilitate priority use opportunities for the public. Continuation of the current condition would result in ongoing erosion and loss of habitat, vegetation, and soil that would, in turn, adversely affect public access and use.

3.4.2 *Alternative B – Proposed Action*

The proposed action would meet the purpose and need of USFWS to protect and restore ANWR resources sufficient to manage habitat requirements and visitor priority use activities on ANWR. This project would protect 5 miles of critically eroding shoreline and stabilize eroding bluffs.

Mitigation measures and BMPs have been developed to protect natural and cultural resources during construction activities. Upon completion of all construction activities, priority uses should return to pre-construction levels, which would not contribute to significant cumulative environmental impacts. The overall potential for adverse impacts would be minimal based on the nature of the action and the implementation of the mitigation measures and conditions described in the above analysis.

Construction activities under the proposed action would have direct and indirect impacts on some natural resources including wildlife and aquatic species, air quality, soils, vegetation, and water resources. Mitigation and BMPs will minimize impacts on these resources. There will be some beneficial long-term impacts on critical habitat for whooping cranes based on ANWR's protection of coastal and estuarine areas. Minimal impacts to archeological resources are anticipated since mitigation measures have dictated that potential marine cultural resources will be avoided during construction.

The proposed action to protect and restore ANWR resources is consistent in meeting the purpose and needs of USFWS because this project would ensure ANWR has provided for the conservation of fish, wildlife, plants, and their habitats within the System to ensure that the biological integrity, diversity, and environmental health of the System are maintained for the benefit of present and future generations. The proposed action would also meet the purpose of establishment of ANWR. USFWS has determined that the proposed action is compatible with the purposes of ANWR and the mission of the NWRS.

3.5 Public Outreach

Internal scoping of ANWR and regional office staff was conducted to identify issues, concerns, and strategies to protect and restore the eroding San Antonio shoreline of ANWR to a functional state for both wildlife utilization and priority uses.

A draft of this EA will be released for a 30-day public review period beginning on XX, 2021. The comment period will end on XX, 2021. A copy of the EA will be available for review on ANWR website: https://www.fws.gov/refuge/Aransas/. Comments or questions can be directed to Joe Saenz, ANWR Manager at (361) 349-1139. Email comments can be provided to the following address: joe_saenz@fws.gov.

List of Preparers

Ray Newby, Anchor QEA

4 References

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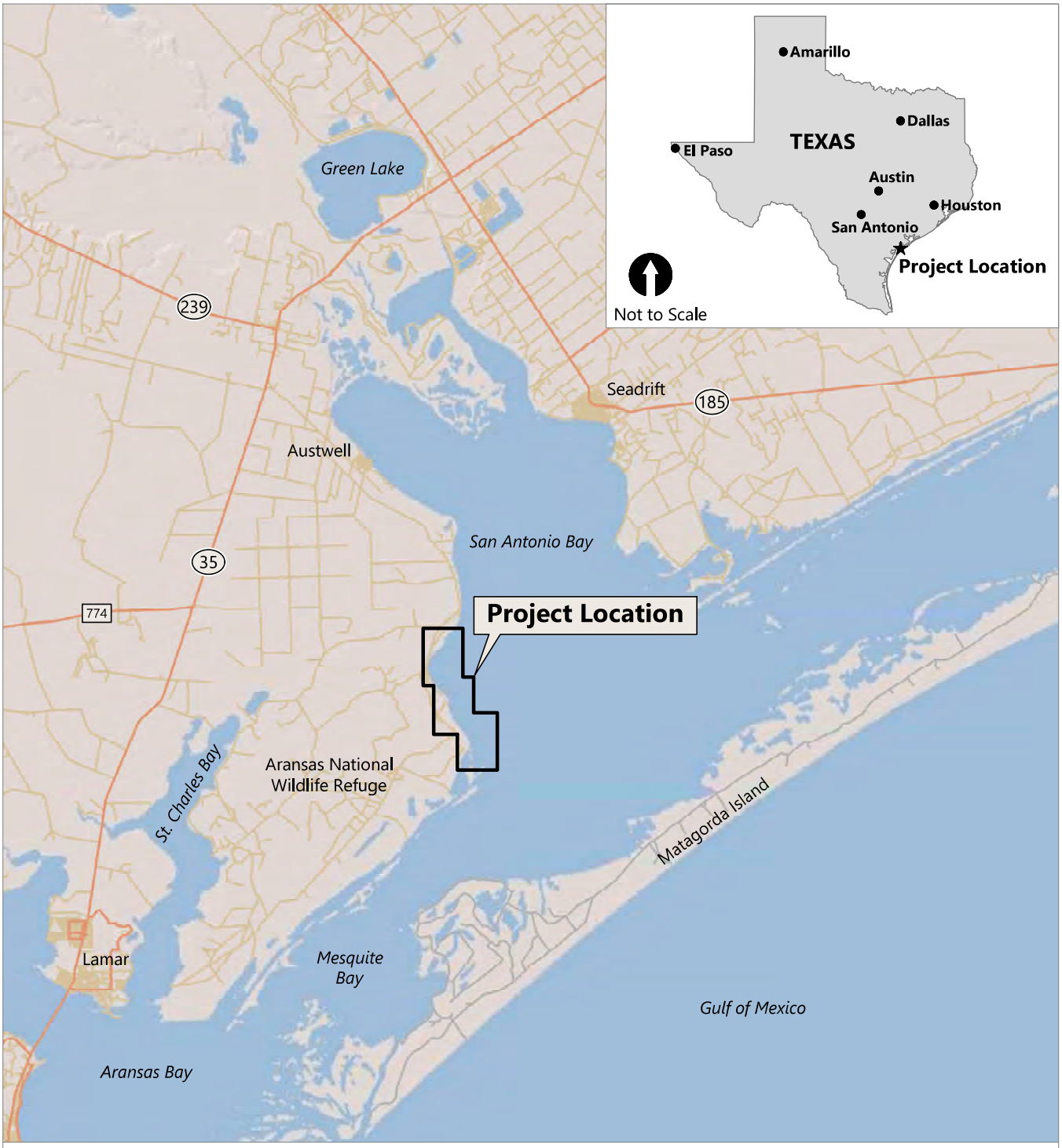
Appendix 1: APPLICABLE STATUTES, EXECUTIVE ORDERS, AND REGULATIONS	
Cultural Resources	
American Indian Religious Freedom Act, as amended, 42 U.S.C. 1996 – 1996a; 43 CFR Part 7 Antiquities Act of 1906, 16 U.S.C. 431-433; 43 CFR Part 3 Archaeological Resources Protection Act of 1979, 16 U.S.C. 470aa – 470mm; 18 CFR Part 1312; 32 CFR Part 229; 36 CFR Part 296; 43 CFR Part 7 National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470-470x-6; 36 CFR Parts 60, 63, 78, 79, 800, 801, and 810 Paleontological Resources Protection Act, 16 U.S.C. 470aaa –470aaa-11 Native American Graves Protection and Repatriation Act, 25 U.S.C. 3001-3013; 43 CFR Part 10 Executive Order 11593 – Protection and Enhancement of the Cultural Environment, 36 Fed. Reg. 8921 (1971) Executive Order 13007 – Indian Sacred Sites, 61 Fed. Reg. 26771 (1996)	Protection of potential cultural resources in the vicinity of the construction area will be needed as agreed upon during consultation with the Texas State Historic Preservation Office.

Fish and Wildlife	
Bald and Golden Eagle Protection Act, as amended, 16 U.S.C. 668-668c, 50 CFR 22	BGEPA prohibits the take of bald and golden eagles. No take of these species would occur from any of the alternatives.
Endangered Species Act of 1973, as amended, 16 U.S.C. 1531-1544; 36 CFR Part 13; 50 CFR Parts 10, 17, 23, 81, 217, 222, 225, 402, and 450	No take of threatened or endangered species or adverse modification to designated critical habitat would occur from any of the alternatives. All mitigation measures discussed and agreed upon in consultation efforts on Section 7 of the Endangered Species Act with USFWS's Corpus Christi Ecological Field Office in relation to this project would be strictly administered.
Secretarial Order No. 3356.	The alternatives were designed to contribute towards the purpose of "increase outdoor recreation opportunities for all Americans, including opportunities to hunt and fish".
Migratory Bird Treaty Act (MBTA), as amended, 16 U.S.C. 703-712; 50 CFR Parts 10, 12, 20, and 21	The MBTA prohibits the take of species of birds listed under the four international migratory bird treaties signed by the U.S. (50 CFR 10.13). The ANWR would implement mitigation measures to avoid take of protected bird species.
Executive Order 13186 – Responsibilities of Federal Agencies to Protect Migratory Birds, 66 Fed. Reg. 3853 (2001)	The alternatives were designed to minimize impacts to habitat.

Figures



SOURCE: Basemap ©2014 Esri
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VERTICAL DATUM: North American Vertical Datum of 1988 (NAVD88)

0 5
Miles

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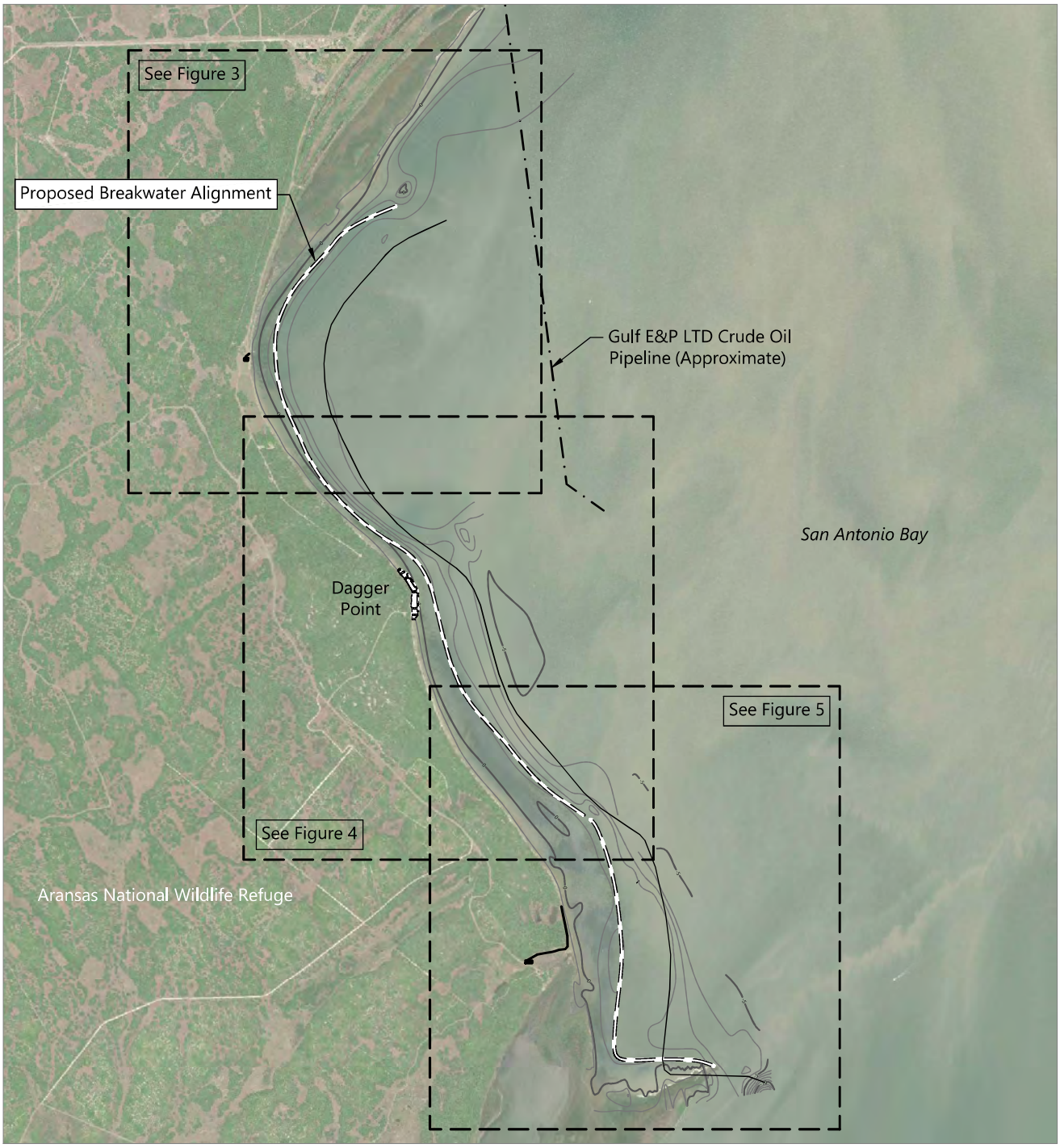
ANCHOR QEA

Figure 1
Vicinity Map

Environmental Assessment
Dagger Point Coastal and Marine Habitat Protection and Restoration



SOURCES:

1. Aerial image ©2019 Microsoft Corporation ©2019 DigitalGlobe ©CNESS (2019) Distribution Airbus (DS)
2. Bathymetric survey by Naismith Marine Services dated August 2019

HORIZONTAL DATUM: Texas State Plane South Central, North American Datum of 1983 (NAD83), U.S. Survey Feet

VERTICAL DATUM: North American Vertical Datum of 1988 (NAVD88)

LEGEND:

Existing Bathymetry (1' Interval)

0 3600

Feet

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Filepath: k:\Projects\0737-coastal bend bays and estuaries project\dagger point coastal habitat restoration\0737-EA-002 (Plan View).dwg Figure 2

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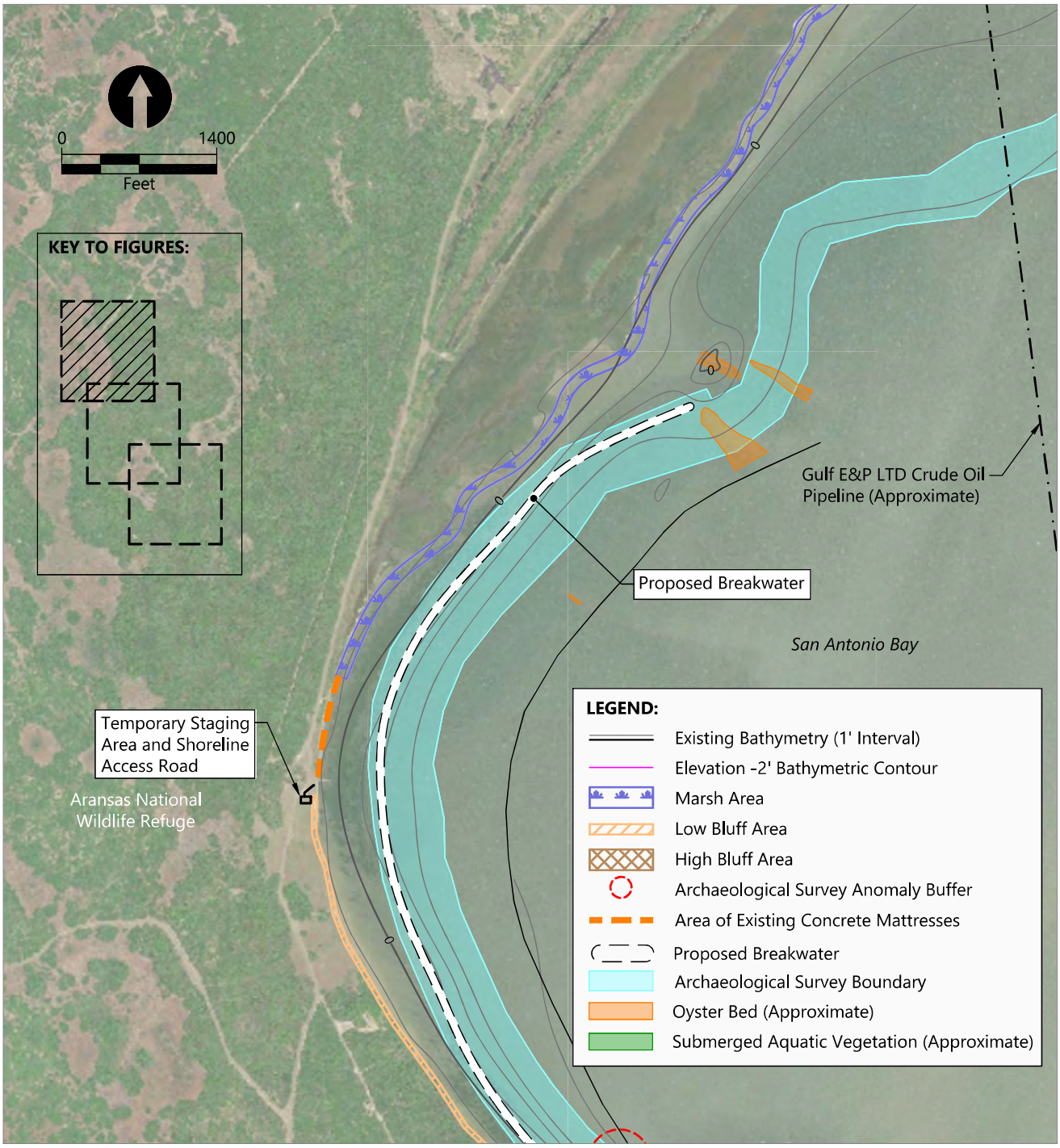
Figure 2
Project Area Plan View

Environmental Assessment
Dagger Point Coastal and Marine Habitat Protection and Restoration



SOURCES:

1. Aerial image ©2019 Microsoft Corporation ©2019 DigitalGlobe ©CNESS (2019) Distribution Airbus (DS)
2. Bathymetric survey by Naismith Marine Services dated August 2019
3. Submerged aquatic vegetation (SAV) and oyster surveys by Bio West conducted between April and May 2020.
4. Archaeological survey by SEARCH conducted between April and May 2020, and January 2021

HORIZONTAL DATUM: Texas State Plane South Central, North American Datum of 1983 (NAD83), U.S. Survey Feet
VERTICAL DATUM: North American Vertical Datum of 1988 (NAVD88)

NOTES:

1. Anchor QEA proposed breakwater will generally be placed along the -1.0 to -2.0 foot NAVD 88 contour and/or outside of the extents of the SAV.
2. Gap spacing and dimensions between breakwater segments to be determined during advancement of design.

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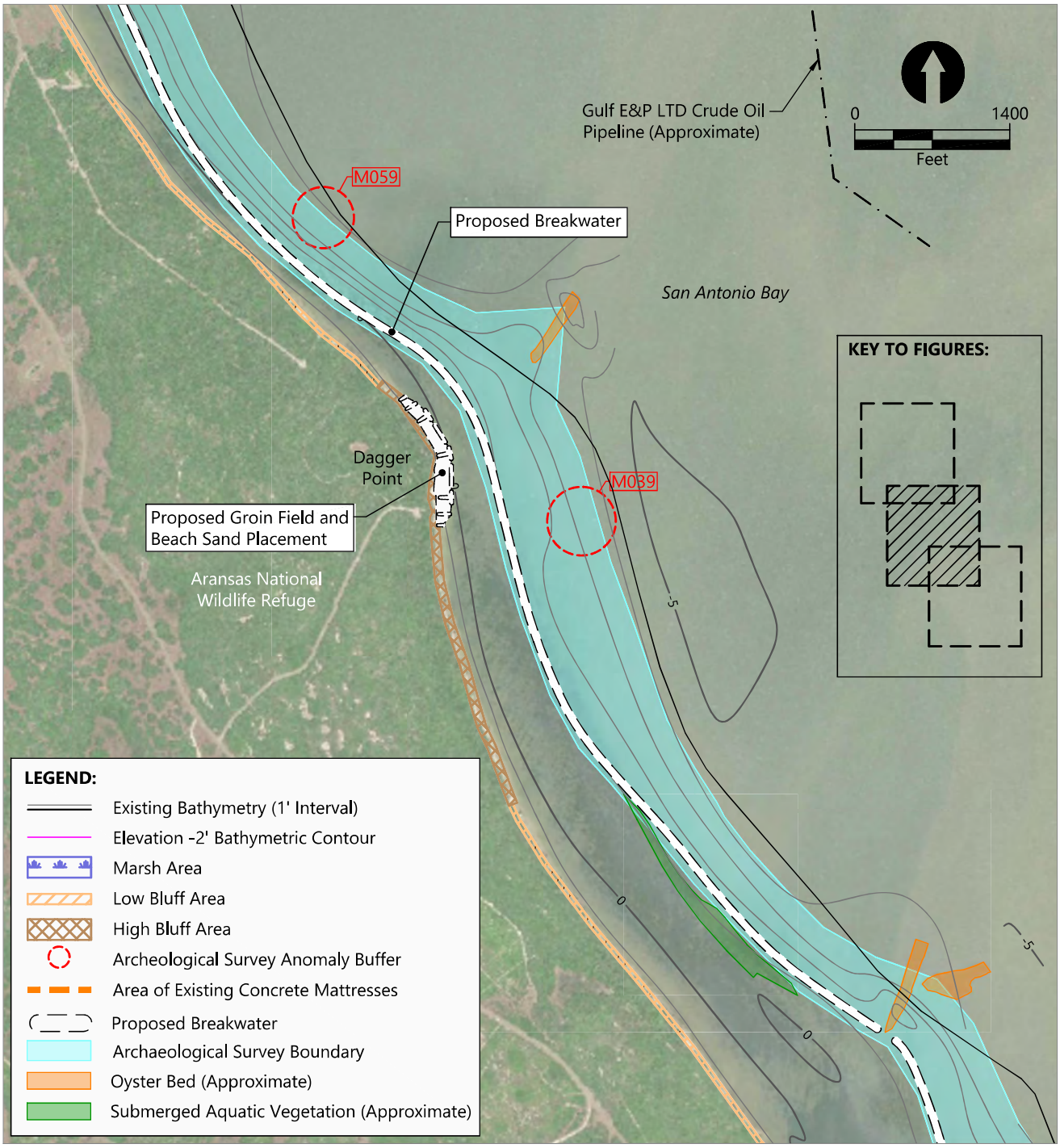
Figure 3
Plan View North

Environmental Assessment
Dagger Point Coastal and Marine Habitat Protection and Restoration



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2. Gap spacing and dimensions between breakwater segments to be determined during advancement of design.

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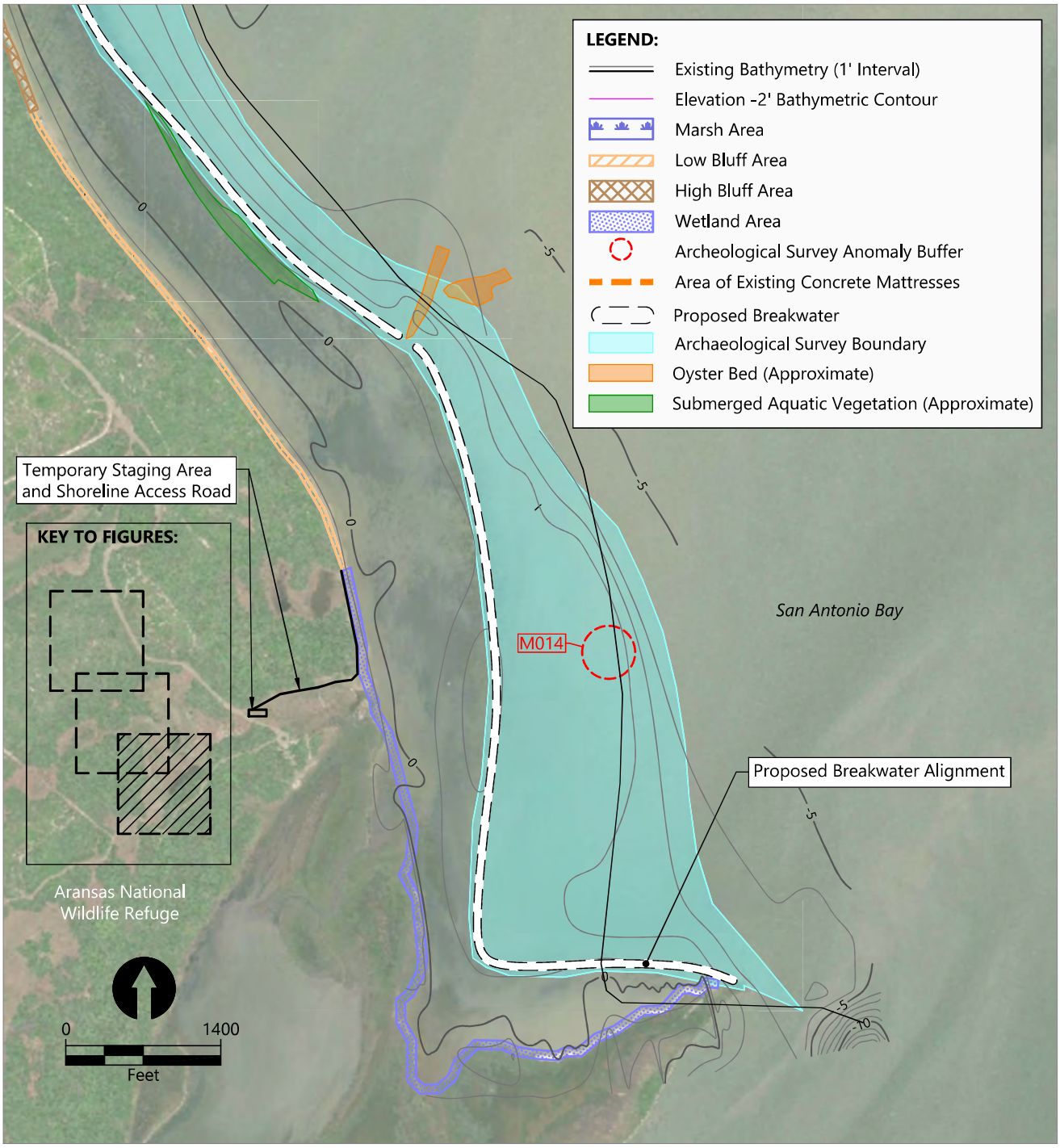
Figure 4
Plan View Central

Environmental Assessment
Dagger Point Coastal and Marine Habitat Protection and Restoration



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2. Bathymetric survey by Naismith Marine Services dated August 2019
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4. Archaeological survey by SEARCH conducted between April and May 2020, and January 2021

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VERTICAL DATUM: North American Vertical Datum of 1988 (NAVD88)

NOTES:

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2. Gap spacing and dimensions between breakwater segments to be determined during advancement of design.

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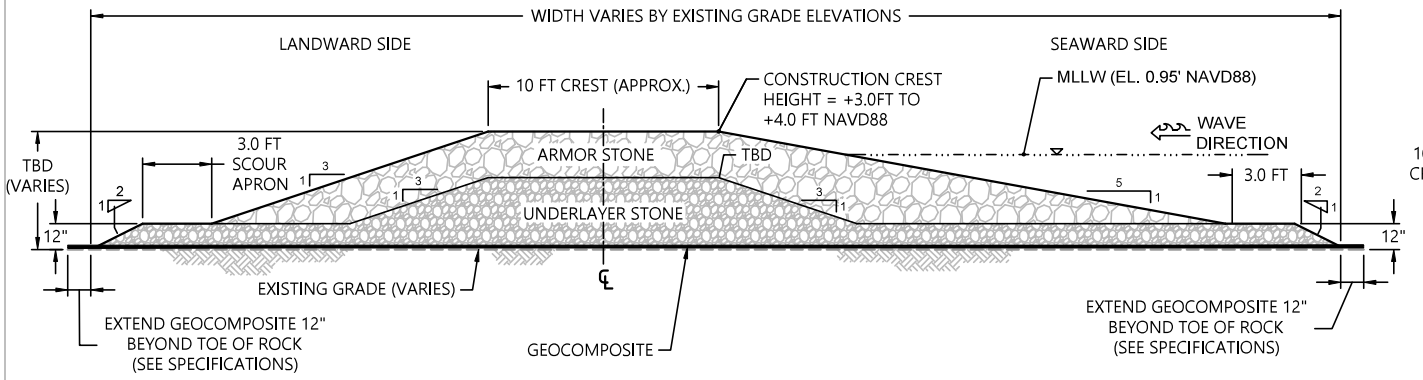
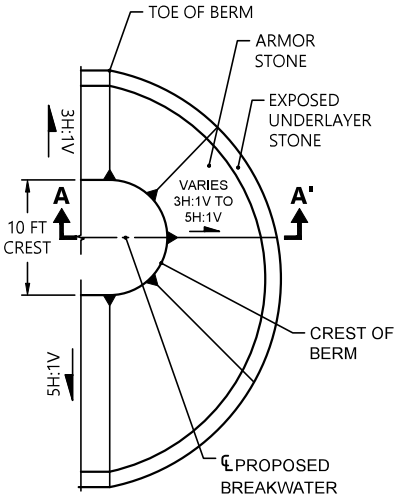
Figure 5
Plan View South

Environmental Assessment
Dagger Point Coastal and Marine Habitat Protection and Restoration

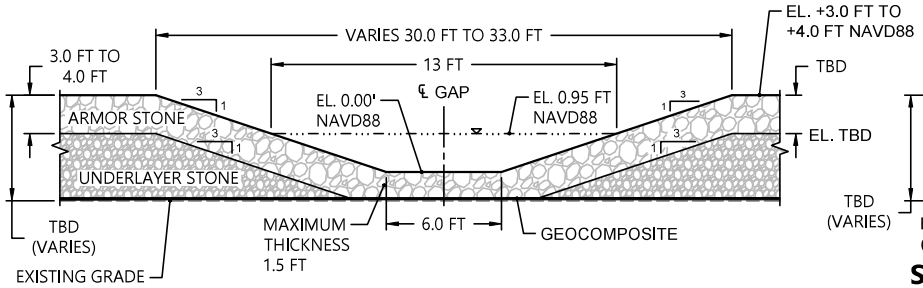


NOTE:
(1) Crest width, height, and base width of breakwater subject to revision during advancement of design.

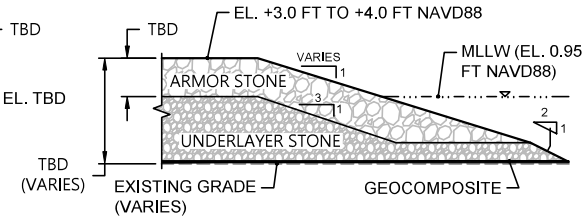
Typical Rock Rubble Breakwater Cross Section
Not to Scale



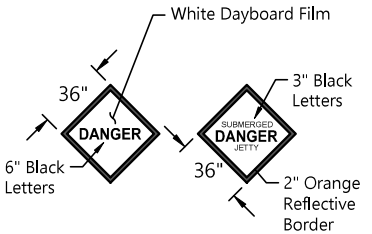
Typical Breakwater Roundhead at End Plan View
Not to Scale



Typical Breakwater Gap Profile
Not to Scale



Section A-A' - Typical Breakwater Roundhead at End
Not to Scale



Typical Warning and/or Aid to Navigation Signage
Not to Scale

NOTE:
For information only. Final Aid to Navigation details to be determined by USCG after approval of the USACE permit.

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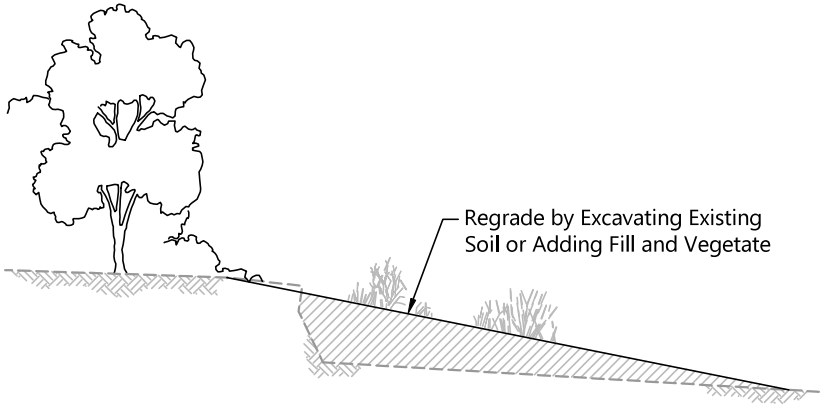
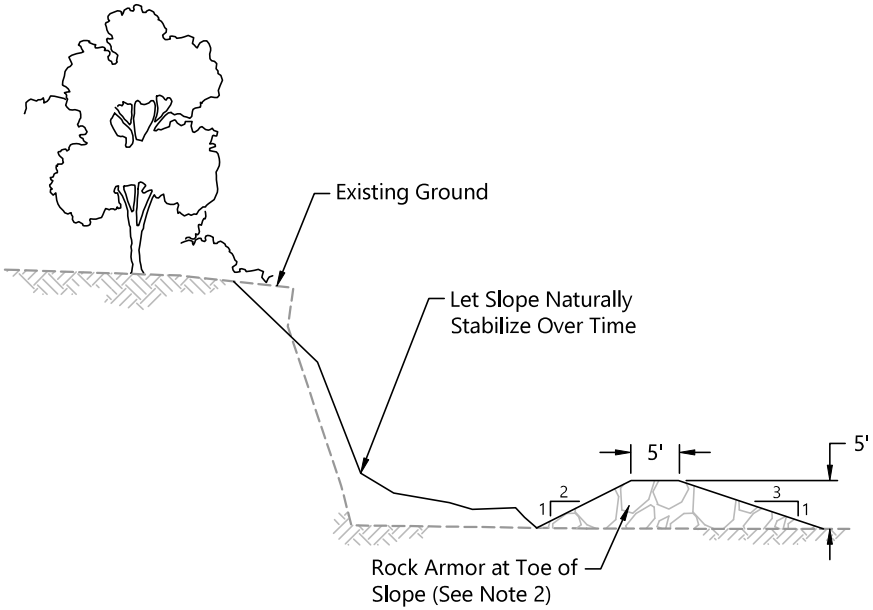
Figure 6
Typical Rock Rubble Breakwater Details

Environmental Assessment
Dagger Point Coastal and Marine Habitat Protection and Restoration



Typical Low Bluff Regrading and Vegetating
Not to Scale



Typical High Bluff Self Stabilization and Toe Protection
Not to Scale

NOTES:
1. After slope has stabilized, planting of the slope may be carried out to further stabilize the slope.
2. Actual design to be determined during final design. Geometry shown is for the purposes of estimating proposed impacts for permit.

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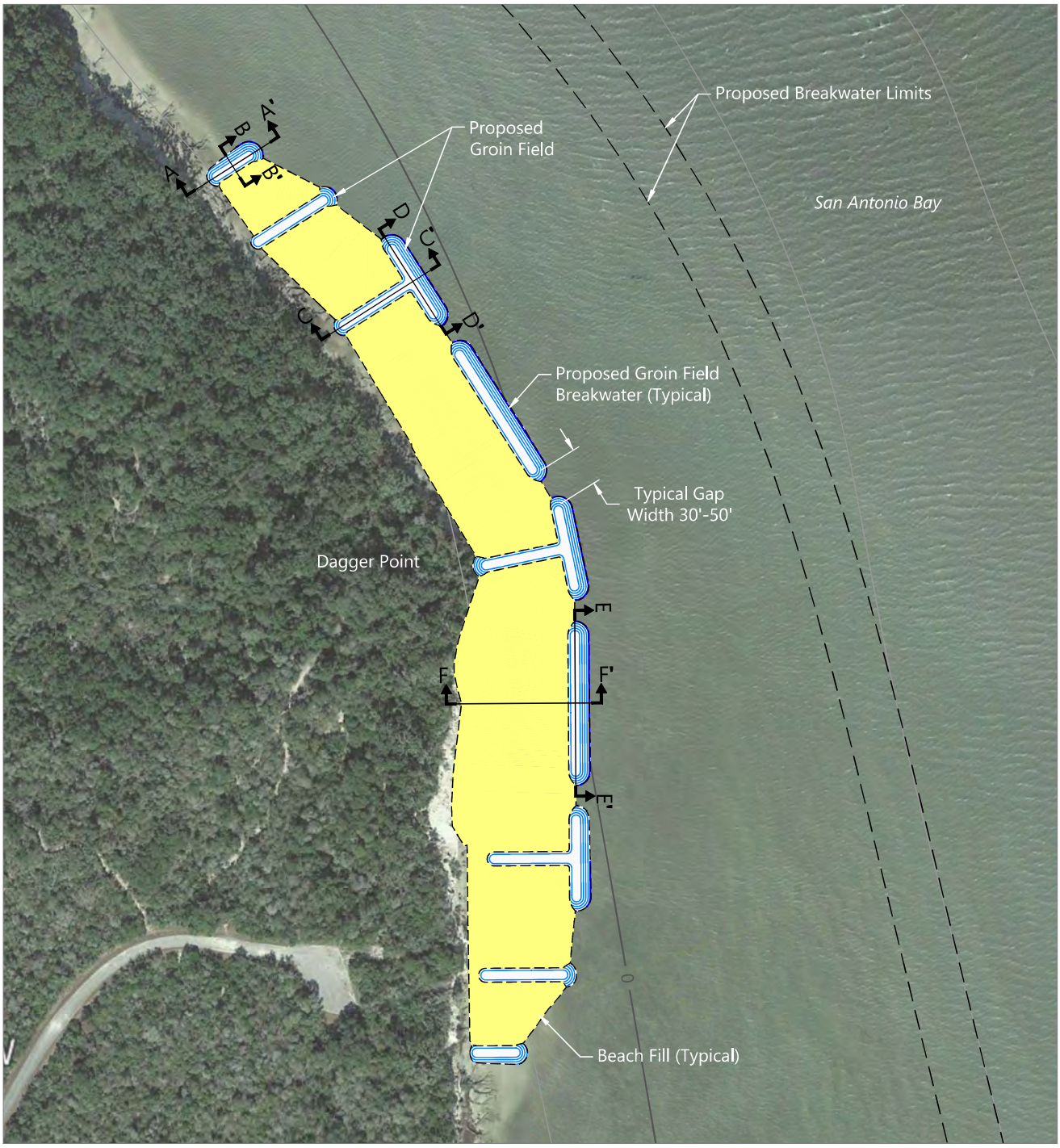
Figure 7
Bluff Stabilization Alternatives

Environmental Assessment
Dagger Point Coastal and Marine Habitat Protection and Restoration



SOURCES:
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2. Bathymetric survey by Naismith Marine Services dated August 2019

HORIZONTAL DATUM: Texas State Plane South Central, North American Datum of 1983 (NAD83), U.S. Survey Feet
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LEGEND:

Existing Bathymetry (1' Interval)

A — Cross Section Location and Designation (See Figures 9, 10 & 11)

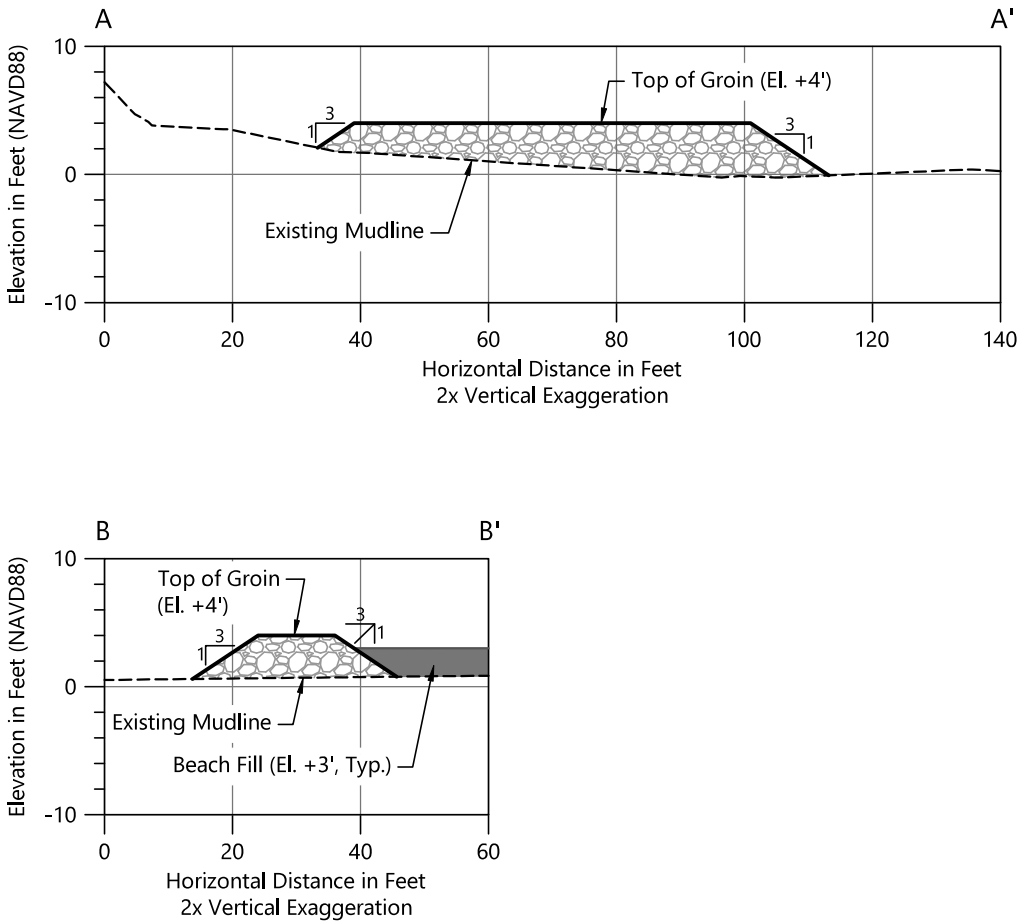
0 200
Feet

Publish Date: 2021/10/04 6:48 AM | User: dholmer
Filepath: k:\Projects\0737-coastal bend bays and estuaries project\dagger point coastal habitat restoration\0737-EA-003 (Groin Field).dwg Figure 8

ANCHOR QEA

Figure 8
Proposed Groin Field and Beach Fill Area Plan View

Environmental Assessment
Dagger Point Coastal and Marine Habitat Protection and Restoration



Publish Date: 2021/10/04 6:48 AM | User: dholmer
Filepath: k:\Projects\0737-coastal bend bays and estuaries project\dagger point coastal habitat restoration\0737-EA-003 (Groin Field).dwg Figure 9

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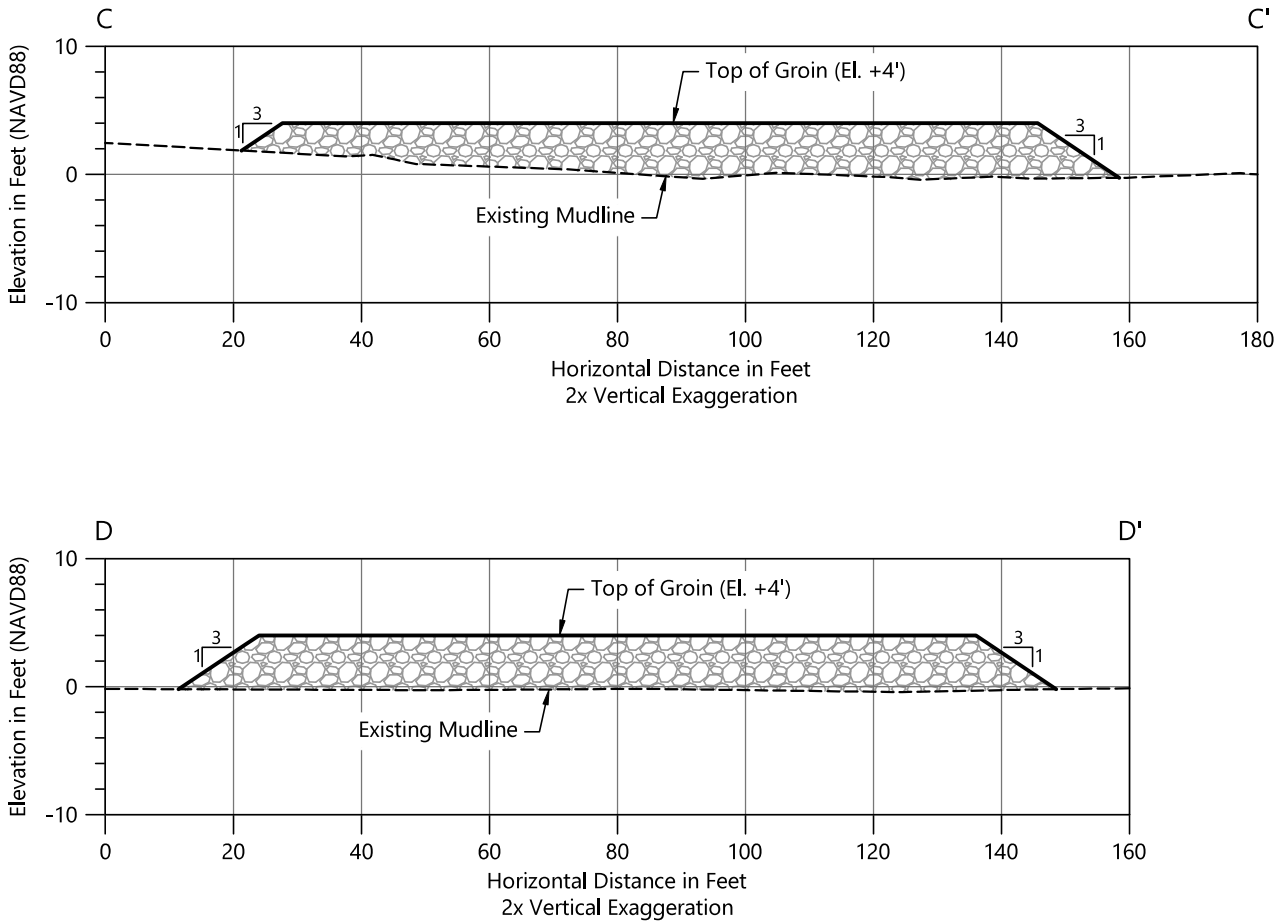
Figure 9
Typical Straight Groin Cross Sections

Environmental Assessment
Dagger Point Coastal and Marine Habitat Protection and Restoration

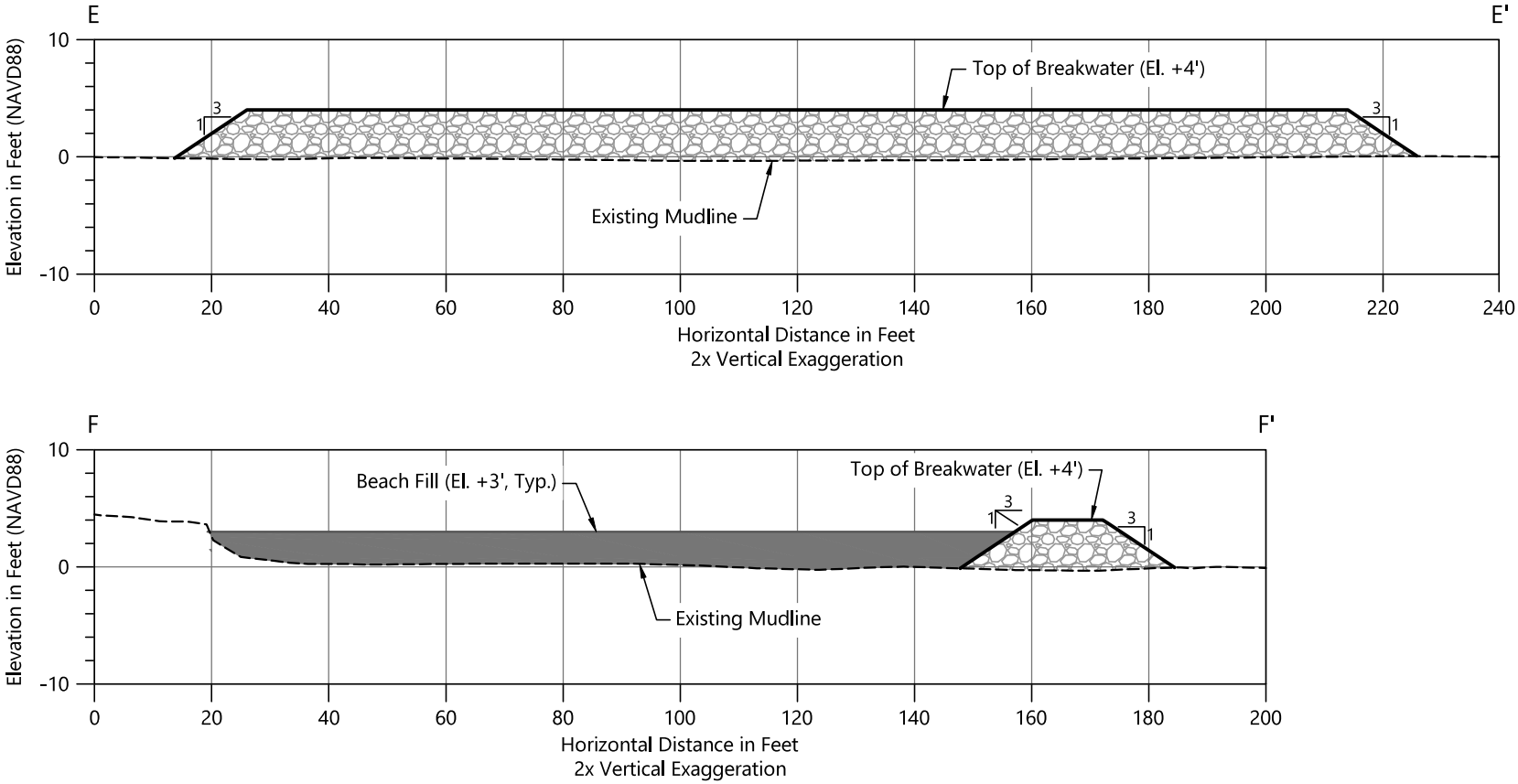


Publish Date: 2021/10/04 6:49 AM | User: dholmer
Filepath: k:\Projects\0737-coastal bend bays and estuaries project\dagger point coastal habitat restoration\0737-EA-003 (Groin Field).dwg Figure 10

ANCHOR QEA

Figure 10
Typical T-Groin Cross Sections

Environmental Assessment
Dagger Point Coastal and Marine Habitat Protection and Restoration



Publish Date: 2021/10/04 6:49 AM | User: dholmer
Filepath: k:\Projects\0737-coastal bend bays and estuaries project\dagger point coastal habitat restoration\0737-EA-003 (Groin Field).dwg Figure 11

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Figure 11
Typical Breakwater Cross Sections

Environmental Assessment
Dagger Point Coastal and Marine Habitat Protection and Restoration

NMFS Endangered Species Act Section 7 Checklist

For common, minor coastal construction projects

Updated 09/15/2015

A) Project Identification

Lead Action Agency:	US Army Corps of Engineers, Galveston District
Agency Contact: (Phone, Email)	Mark Pattillo, 361-814-5847 ext. 1004, Mark.E.Pattillo@usace.army.mil
Applicant Name/ Contact: (Phone, Email)	U.S. Fish and Wildlife Service/Joe Saenz, 361-349-1139, joe_saenz@fws.gov
Project Name & ID #:	Aransas NWR Dagger Point Coastal and Marine Habitat Protection and Restoration Project

Are any aspects of the proposed project being authorized under a separate consultation? (SAJ general permits, GRBO, SARBO, NWP, Programmatic consultation, etc.)

No

B) Project Location and Site Description

1. Address, including county and state, and description of property (public, residential, commercial, industrial, etc.):

2. a) Latitude & Longitude:

i. Required to be submitted in Decimal Degrees and Datum (e.g., 27.71622 , -80.25174 [NAD83])

ii. Online conversion: http://transition.fcc.gov/mb/audio/bickel/DDDMMSS-decimal.html

28.28, - 96.80 (WGS84)

3. Waterbody:

i. Name of the body of water on which the project is located (St. Johns River, Tampa Bay, Suwannee River, etc.)

ii. If riverine or estuarine, approximate navigable distance from marine environment (e.g., Atlantic, Gulf of Mexico)

San Antonio Bay

C) Project Site Resource Description

1. Existing Structures: (Describe current structures in project area)
   - i. Marina, riprap, dock, etc.
   - ii. Number of slips. size (area of overwater structure), linear or square footage, location, orientation, etc.

NA

2. Existing Conditions: (Describe the project area)
   - i. Substrate type, water quality, depth, etc.
   - ii. List any alterations to substrate type, water quality, depth, etc, resulting from the proposed action (qualitative and quantitative)

- The area is relatively shallow , sandy open water bottoms.
- A 5-mile rock breakwater is proposed to be constructed along the shoreline with 4,200 ft of bluff toe protection along the base of the high bluffs and a series of near shore BWs and groins with sand fill constructed along a 1,300 ft section of high bluffs at Dagger Point to reduce erosion and scarping to allow the bluff slopes to stabilize and re-vegetate. The rock would be potentially conducive for oyster habitat development. Sand fill of similar grain size and mineralogy to native sediment will be placed between the shoreline and near shore groins and breakwaters at Dagger Point to restore the base of the eroded high bluffs.
- There should be no impacts to water quality from the construction of the breakwater due to BMPs implemented.

3. Seagrasses & Other Marine Vegetation

i. If a benthic survey was conducted provide date of survey and a copy of the report
ii. Species area of coverage estimates and density of species coverage (percentage) estimates
iii. Location relative to proposed structures. Provide detailed sketch of action area and location of marine vegetation
iv. List any impacts to seagrasses or other marine vegetation resulting from proposed action (square feet)

SAV study conducted April 7 and May 5, 2020, report attached; no SAV was found in the proposed project footprint, impacts to SAV will be minimized during construction and state and federal resource agency representative recommendations of buffers of 20 to 30 feet be established between the breakwater structures and any SAV and oyster reefs identified during the SAV survey.

4. Mangroves

i. Species (red, black, or white)
ii. Area (square and linear feet). Provide detailed sketch of the action area and location of mangroves.
iii. List any impacts to mangroves resulting from the proposed action (square and linear feet)

There are no mangroves present in or near the project site.

5. Corals

i. If a benthic survey was conducted provide date of survey and a copy of the report
ii. Species Present
iii. Area of coverage and density estimates (percentage, include estimates for each species)
iv. Location relative to proposed structures. Provide detailed sketch of action area and location of corals.
v. List any impacts to corals resulting from proposed action (number and size of colonies and/or fragments)

There are no corals present in or near the project site.

D) Project Description and Construction Methods

☐ Yes, the applicant has agreed to follow the Mangroves and Seagrass Dock Construction Guidelines (Found here)

☐ Yes, the applicant has agreed to follow NMFS Johnson's Seagrass Dock Construction Guidelines (Found here)

☒ Yes, the applicant has agreed to follow the NMFS Sea Turtle and Smalltooth Sawfish Construction Conditions (Found here)

1. Project: (Please describe)

The USFWS is proposing to construct a 5-mile shoreline protection and bluff stabilization project for the eroding shoreline of the Aransas National Wildlife Refuge (ANWR) along San Antonio Bay, particularly along Dagger Point. The proposed action is to construct a continuous breakwater (BW) around Dagger Point and a series of segmented rock BWs on the northern and southern alignments parallel and offshore of the existing shoreline and provide toe protection to the eroding bluffs. A low-crested rubble-mound (rock) structure is proposed for the BWs and as toe protection for the high bluff areas. The proposed design of the BW structures includes a max. crest elevation between +3.0 to +4.0 feet (ft) North American Vertical Datum of 1988 (NAVD88) with a crest width of 10 ft. The bayward face of the BW would have a slope of 1-ft vertical drop for every 5 ft of horizontal run (5H:1V) with the landward slope of 3H:1V. Approx. 4,200 ft of armored toe protection will be constructed at the base of the high bluffs including a series of near shore BWs and groins with sand fill constructed along a 1,300 ft section of high bluffs at Dagger Point. Sand of similar grain size and mineralogy to native sediment will be obtained from either a commercial source or from material dredged from the GIWW. Low bluffs will be regraded to reduce the angle of the slope and then planted with vegetation.

2. In Water Structures:

i. Type of structure(s) (e.g. boat basin, riprap, seawall)
ii. Square and/or linear feet of structure(s)
iii. Number of new vessels/slips, if any
iv. Is this structure new, removal, or replacement?

A new breakwater and bluff stabilization will be built from imported stone. The breakwater length is 26,400 linear feet of breakwater, 4,200 LF of bluff toe protection.

3. Overwater Structures:

i. Will the structure have grated decking?
ii. Proposed spacing between boards (0.5-inch, 0.75-inch, none, etc.)
iii. Height above mean high water (MHW) elevation
iv. Directional orientation of main axis of dock
v. Overwater area (calculate square footage)
vi. Is this structure new, removal or replacement?

No overwater structures proposed in this project.

4. If the proposed structure is a fishing pier please answer the following:

i. Is the fishing pier public or private?
ii. How many people are expected to fish from the pier each day?
iii. What is the applicant's plan to address hook-and-line captures at the fishing pier?
iv. Will there be any educational signs posted?

The proposed project is not a fishing pier.

5. Methods: (For pile installation, please see Pile Installation section below)

i. Step-by-step construction methodology
ii. Demolition/ removal of existing structures and debris
iii. Location of work (barge, upland or both)

No piles will be installed for this project.

6. Pile Installation (Use additional rows for each combination of pile size and material**)**

Pile Material	Installation Method	Number of Piles	Pile Size (inches)	Max. number of piles to be driven per day	Average number of strikes per pile

Will piles be driven in a confined space (150' to nearest sound reflecting object)?

Yes ○
No ◉

Will noise abatement be used?

Yes ○
No ◉

Noise abatement details:

NA

Pile Installation details/notes:

NA

7. Dredging

Dredge Type: (Hopper, clamshell, etc.)

NA

Area (sq. ft.) to be dredged:

NA

Depth of cut:

NA

Volume of material to be dredged: (cubic yards)

NA

Sediment testing: (Has the material to be dredged been tested? Is there any contamination?)

NA

Spoil disposal plans: (location of disposal area, sediment type at disposal area, etc.)

NA

8. Artificial Reefs

Please refer to the artificial reef program websites for the particular state in which the project will occur:
Alabama; Florida; additional Florida guidance; Mississippi; Louisiana; South Carolina; North Carolina; Texas

i. Reef site selection (process details)
ii. Materials to be used
iii. Deployment Method
iv. Deployment schedule

There are no artificial reefs being placed in this project.

9. Construction Schedule

i. Number of days/weeks/months of in-water work
ii. Daylight construction only?
iii. Seasonal restrictions?

The construction of the dikes should not take longer than 365 days depending on weather conditions. All construction activities would be completed to minimize any environmental impacts to sea turtles, shorebirds, or other species to the maximum extent practicable. If the contract is delayed and the contractor must work into nesting season, discussion with USFWS and/or NMFS will be initiated to discuss proper mitigation measures (i.e. daily monitoring and/or relocation activities) to avoid adverse impacts.

10. Conservation/ Protective Measures

How is conservation, or other protective measures, being incorporated into this project, if at all?

- Turbidity will be monitored during construction.
- To avoid potential impacts to sea turtles in the marine environment, the applicant will comply with NMFS' Sea Turtle and Smalltooth Sawfish Construction Conditions and USFWS standard manatee conditions for in-water activities.

Marine Natural Resource Surveys for the Dagger Point Coastal and Marine Habitat Protection and Restoration Project

Located in
Aransas County, Texas

Prepared for:

ANCHOR QEA

9797 Timber Circle, Suite B
Daphne, AL 36527

Prepared by:

BIO-WEST

1018 Frost Street
Rosenberg, Texas 77471

May 2020

Table of Contents

Tables

Figures

Appendices

1.0 INTRODUCTION

At the request of Anchor QEA (AQ), BIO-WEST, Inc. (BIO-WEST) conducted a baseline marine natural resource survey related to a proposed living shoreline project in San Antonio Bay adjacent to the Aransas National Wildlife Refuge (ANWR) in Aransas County, Texas. (Figure 1). For this effort, BIO-WEST surveyed approximately 330 acres (Figure 1 and 2 in Appendix A) (project corridor).

BIO-WEST employed a variety of survey methods to map marine natural resources, including potential oyster reefs and seagrass beds, in support of on-going Clean Water Act Section 404 permitting requirements. Survey methodology was based on previous efforts approved by the Texas Parks and Wildlife Department (TPWD), U.S. Fish and Wildlife Service (USFWS), and National Marine Fisheries Service (NMFS).

BIO-WEST conducted this marine natural resource survey in two phases: phase one consisted of the remote sensing portion of the survey. Remote sensing survey techniques included the use of a global positioning system (GPS), side-scan sonar (SSS), fathometer, and sub-bottom profiler (SBP), that were processed and presented in a geographic information system (GIS) geo-database. Phase two consisted of the physical investigation of potential oyster reef and seagrass communities identified during the remote sensing survey in phase one. Physical investigation methods included water quality parameter collection, manual tactile feeling of the bottom, sediment collections by the use of an Ekman dredge to estimate seagrass stem counts, and oyster dredge tows. Physical investigations served to establish site conditions, verify remote sensing survey results, provide biological information, and confirm the presence of absence of seagrass beds and oyster reef.

Along with data files for analysis, BIO-WEST produced maps depicting current reef locations, seagrass beds, and bathymetric contours (Appendix A). BIO-WEST marine natural resource survey efforts between April 7 and May 5, 2020, under BIO-WEST's current TPWD Scientific Collection Permit. This report provides the methodology and results describing the location and extent of oyster reefs within the 330-acre project corridor in San Antonio Bay.

2.0 METHODOLOGY

2.1 Remote Sensing Survey

BIO-WEST conducted remote sensing surveys in order to map the location and extent of potential marine natural resources within the project corridor. Field efforts consisted of SSS surveys, sub-bottom profiling, and data processing.

2.1.1 Side-Scan Sonar

Equipment for this survey consisted of an EdgeTech® Chirp 900 kilohertz (kHz) SSS sensor "towfish", topside processor; with DISCOVER acquisition software, a Teledyne Odom Hydrographic, Inc. Hydrotrac™ 200 kHz single beam echo sounder (fathometer), and a Hemisphere® VS111 differentially-corrected global positioning system (DGPS) receiver. Vessel guidance, position, and data logging were accomplished with Trimble® HYDROpro™ Navigation software. Figure 1 provides an illustration depicting equipment layout on the survey vessel.

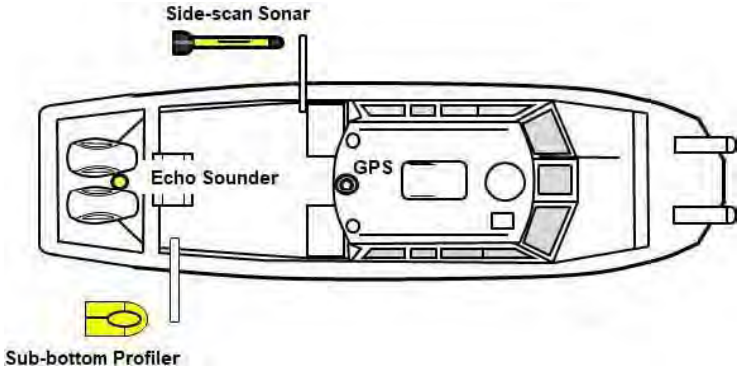


Figure 1. Equipment layout for the survey vessel.

The SSS topside processor recorded acoustic imagery in continuous streams while embedding sensor position information, vessel course, and vessel speed from the DGPS receiver. The survey vessel was guided along predetermined transects spaced 70 feet (20 meters) apart. SSS imagery was recorded through 150m width swaths (75m on either side of the survey vessel) along these transects, resulting in approximately 330 percent overlap of the majority of sonar data. This spacing was chosen to ensure optimum image quality and to provide nine evenly spaced transects within the 330-acre (ac) project site.

Depth soundings were collected in a narrow beam directly below a transducer affixed to the survey vessel. This data set was collected as a bathymetric record in the navigation software and was associated with positional information at a rate of once per second. The bathymetric record was used to create contours that aid with SSS interpretation. Positional information from the DGPS for the survey vessel and each instrument sensor was collected at a rate of one reading per second. Instrument off-set distances from the DGPS antenna were incorporated into the positional record to increase accuracy. Vessel speed during the survey averaged 4.0 knots (4.6 miles per hour) providing in line data point spacing of approximately 6.8 feet (2.1 meters). A minimum water depth of 2.5 feet (0.76 meters) was required to provide adequate depth for the towfish and draft for the navigation vessels. Field notes were maintained and photographs were collected in order to document the survey and assist with subsequent data processing.

2.1.2 Sub-Bottom Profiler

An Edgetech 3100P subbottom profiler was utilized during the remote sensing portion of this marine natural resources investigation to record high resolution images of the sub-bottom stratum layers within San Antonio Bay. The SBP operates at a frequency of 4-24 kHz providing a combination of good sub-bottom penetration, up to 40 meters in suitable sediment, while also maintaining detailed image resolution. The SBP emits an acoustic "chirp" to the seafloor, as the chirp makes contact with and penetrates the sediment the energy is reflected back to the SBP. Based on the return time between the SBP emitting and receiving the acoustic frequency and the strength of the returned signal from the sediment, different densities and depths of sub-bottom stratum layers can be identified. The SBP was towed on the starboard side of the survey vessel by the use of a deck-mounted electric wench. The SBP was maintained at a depth just above the substrate that prevented it from dragging the bottom, while also allowing the best penetration into the sediment. All sub-bottom profiling data collected during the remote sensing survey portion of the marine natural resources survey was provided to the appropriate natural resource agencies in an unprocessed format.

2.1.3 Data Processing

Side scan sonar data sets were recorded and exported from Edgetech, Inc. DISCOVER acquisition software. The data sets were then processed to produce remote sensing imagery. A single mosaic image was created from individual survey lines utilizing Chesapeake Technology, Inc. SonarWiz 7.0® processing software. To provide a clear and accurate image, the sonar imagery was calibrated using empirical gain normalization for contrast and clarity. The imagery was then modified to remove extraneous data such as the nadir region (the area directly below the towfish) and water column interference. Following this process, the imagery was combined using embedding positional data to create a single geo-rectified mosaic at a resolution of 0.10 feet per pixel. This high-resolution imagery was used to remotely delineate oyster reef and seagrass bed locations with verified data from the physical investigation phase.

Bathymetric data was exported from the navigation software and tidally-corrected to the mean low water (MLW) datum using preliminary data from Texas Coastal Ocean Observation Network (TCOON), part of the Division of Near Shore Research (DNR). The TCOON website offers this disclaimer: *The data described below have been collected by automated equipment and are furnished "as is" DNR makes no warranties (including no warranties as to merchantability or fitness) either expressed or implied with respect to the data or their fitness for any specific application."* After tidal correction, depth measurements were processed through a smoothing algorithm to eliminate outliers, and bathymetric contours were created at 0.5-ft (0.3048-meter) intervals using ESRI™ ArcMap® Pro.

All remote sensing data and imagery was imported into an ESRI™ ArcMap® Pro GIS geo-database. The geo-database provides, among other tools, data organization, geospatial analyses capability, multiple presentation of data, and layering with other GIS spatial data. Data can be extracted from the database as individual shape files or for viewing in other geospatial formats such as Google Earth ™.

2.2 Physical Investigation

The physical investigation was conducted both concurrently with, and after the remote sensing survey. Concurrent with the remote sensing survey, a physical investigation of seagrass communities was performed by the use of an Ekman dredge as well as manual tactile feeling of the bottom to determine percent cover, stem density, and species composition of seagrass within the project corridor. Once the dataset was processed, BIO-WEST biologists also pulled a modified oyster dredge to confirm substrate characteristics and determine potential presence/absences of oyster reefs or suitable substrate. In addition, current water quality conditions were documented at seven sampling locations. The following sections provide a detailed description of each physical investigation effort.

2.2.1 Oyster Dredge Tows

After completion of the remote sensing phase of the survey, an SSS mosaic was created and used to guide dredge tows (see Section 2.2.3) to verify SSS returns and potential bottom types. Oyster dredge tows were conducted throughout the survey area at targeted locations identified in the SSS imagery as potential reef locations, as well as areas that appeared to be mud, sand, or scattered shell. Sample sites were selected to:

- Verify substrate and suspected oyster reef signatures
- Identify unknown SSS signatures
- Provide the greatest amount of spatial coverage possible throughout the entire project corridor where oyster reefs were suspected

Each dredge tow consisted of a 30-second linear tow within the project corridor using a custom fabricated steel-frame oyster dredge. The dimensions of the tow are 33 inches (80 centimeters) long by 18 inches (47 centimeters) wide by 11 inches (29 centimeters) deep with a 0.5-inch (1.3 centimeters) wire mesh-lined collection basket to retain small shell hash and bivalve/benthic species. Upon retrieval of each tow, contents were described and photo documented (pre- and post-rinse). Oysters were then counted to determine the number of live oysters collected per dredge tow to assist estimating density and health of individual reefs.

2.2.2 Seagrass Communities

BIO-WEST utilized SSS to identify potential seagrass communities within the survey area. Seagrass signatures were identified using SSS during the survey. In areas too shallow for the survey vessel, BIO-WEST ecologists manually mapped seagrass beds using a DGPS. Seagrass boundaries were delineated using manual tactile feel (brailling) of the bottom and direct visual observation. A total of three Ekman dredge sediment cores were collected to estimate the density of seagrass stems within a one-meter quadrat at each sampling location. The substrate composition was documented and then washed through a mesh sieve, leaving behind seagrass stems which were then counted and identified by species. A percent cover of seagrass was also estimated at each one-meter quadrat. In addition, seagrasses were photographed and documented.

2.2.3 Water Quality

BIO-WEST biologists also documented water quality parameters to characterize ambient water conditions within San Antonio Bay at both the dredge tow locations and seagrass sampling locations. Using a YSI® 6920 multi-parameter water quality data sonde, water quality parameters were collected approximately 0.5 feet below the water's surface and approximately one foot above the bottom. The parameters measured included temperature (°C), specific conductivity (mS/cm^3), salinity (‰), dissolved oxygen (DO) (mg/L), and pH (su). Raw water depths (feet), measured by a non-vented strain gauge on the YSI, also were collected. These parameters were measured to verify the suitability for live oyster reef and seagrass communities within and adjacent to the project corridor.

3.0 RESULTS

3.1 Remote Sensing Survey

Remote sensing survey results indicated the presence of oyster reefs associated with the breakwaters that cross the project corridor within San Antonio Bay. These underwater signatures were then used to determine the location and direction of oyster dredge tows during the physical investigation phase. SSS imagery indicated the presence of seagrass adjacent to the western boundary of the project corridor along the shoreline of the Aransas National Wildlife Refuge.

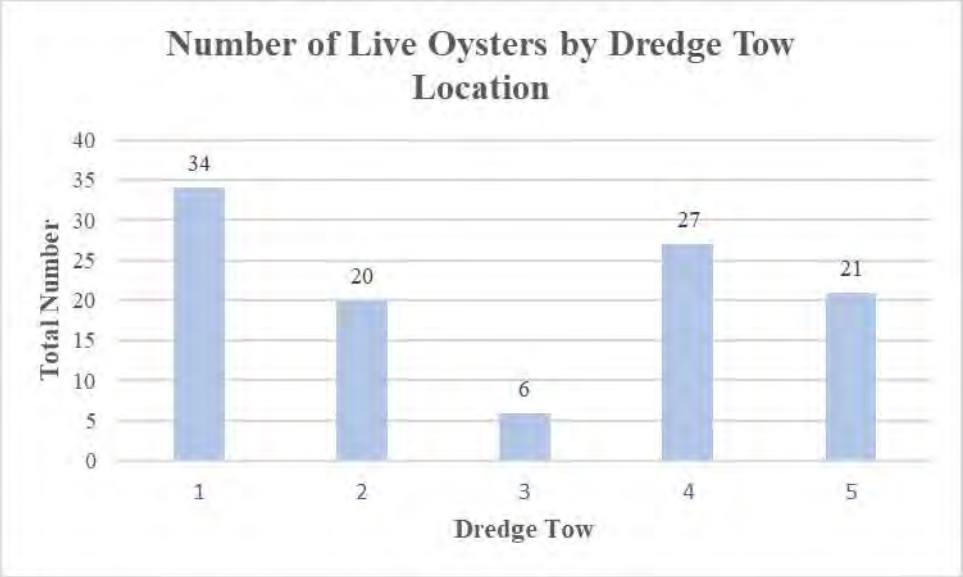
Bathymetric contours were created from depth soundings recorded during the survey. Maps depicting each reef location, the associated depth contours for each reef, and both dredge tow sample locations are presented in Appendix A.

3.2 Physical Investigation

3.2.1 Oyster Dredge Tows

BIO-WEST conducted five dredge tow sample sites within the project corridor based upon SSS imagery and field observations (breaking waves, wind fetch, visible reef structures, etc.) during surveys. All five dredge tow locations were located on publicly accessible potential oyster reefs. A total of 108 live eastern oysters (*Crassostrea virginica*) along with associated organisms were collected in the five dredge tows. An average of 22 oysters were collected in each dredge tow. See Figures 2 for additional information.

Figure 2. Number of live oysters by dredge tow.



Associated reef organisms were found in all dredge tow samples, including barnacles (*Balanus sp.*), serpulid worms (*Hydroides dianthus*), hooked mussels (*Ischadium recurvum*), stone crabs (*Menippe adina.*), blue crabs (Callinectes sapidus), and fiddler crabs (*Uca sp.*). Remnant pieces of seagrass were also collected in the oyster dredge. Photographs of each individual tow are in Appendix B and oyster dredge tow data sheets are provided in Appendix C.

3.2.2 Seagrass

A total of 7 seagrass sampling sites were selected adjacent to the project corridor between the west boundary and the shoreline of the Aransas National Wildlife Refuge based upon SSS imagery collected during phase one. While no seagrass was located within the project corridor, seagrass beds were identified within four of the seven sampling sites. The identified seagrass communities consisted solely of shoal grass (*Halodule beaudettei*). Substrate at all sample locations consisted of coarse and fine grained sands, while water depths averaged 2.55 feet. Photographs of each seagrass sample location are in Appendix B and seagrass survey data sheets are provided in Appendix D.

3.2.3 Water Quality

Standard water quality parameters were collected in San Antonio Bay during both the oyster reef dredge tows and seagrass bed surveys. Water depths within the project site ranged from 2.5 to 5.0 feet below MLW, with an average depth of 3.14 ft. In addition to an overall water quality characterization, stratified sampling was conducted to document any variation that may occur within the water column. The average of each water quality parameter by column depth (surface to bottom) was calculated and presented in Table 2. Additional information on water depth, temperature, salinity, conductivity, DO, and pH were collected and are provided in Appendix E.

Table 1: Water quality results

Parameter	Average	
	Surface	Bottom
Sample Depth (ft)	1.34	2.91
Water Temperature (°C)	24.93	24.74
Conductivity (mS/cm)	33.51	33.76
Salinity (‰)	20.87	21.09
DO (mg/L)	89.88	85.77
pH	8.06	8.07

4.0 DISCUSSION

BIO-WEST completed a marine natural resource survey between April 7 and May 5, 2020. Based on the results of the remote sensing survey and physical investigations, it is BIO-WEST's professional opinion that approximately 5.00 acres of live oyster reefs are located within the project corridor. While no seagrass communities were identified within the project corridor, seagrass beds were present within 750 feet of the southwestern project site boundary.

BIO-WEST greatly appreciates the opportunity to provide the subject marine environmental support, and acknowledges that the data presented here has been summarized to address environmental concerns as depicted in succinct illustrations and text. If additional information is requested, BIO-WEST welcomes the opportunity to discuss these findings in greater detail and provide any additional support sought.

5.0 REFERENCES

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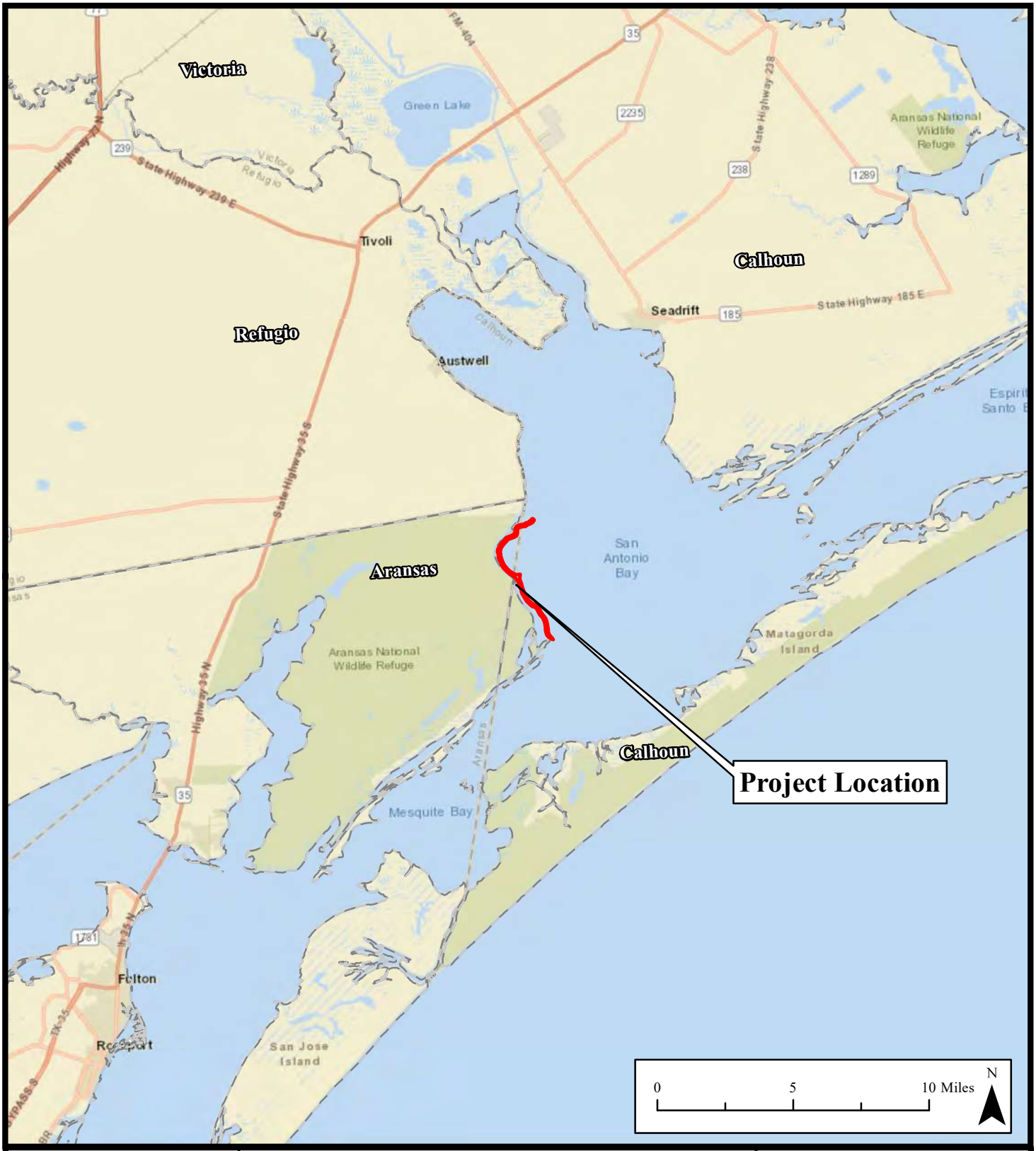
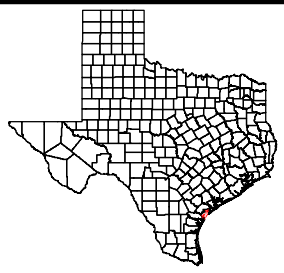
Appendix A

Marine Natural Resource Maps





Legend

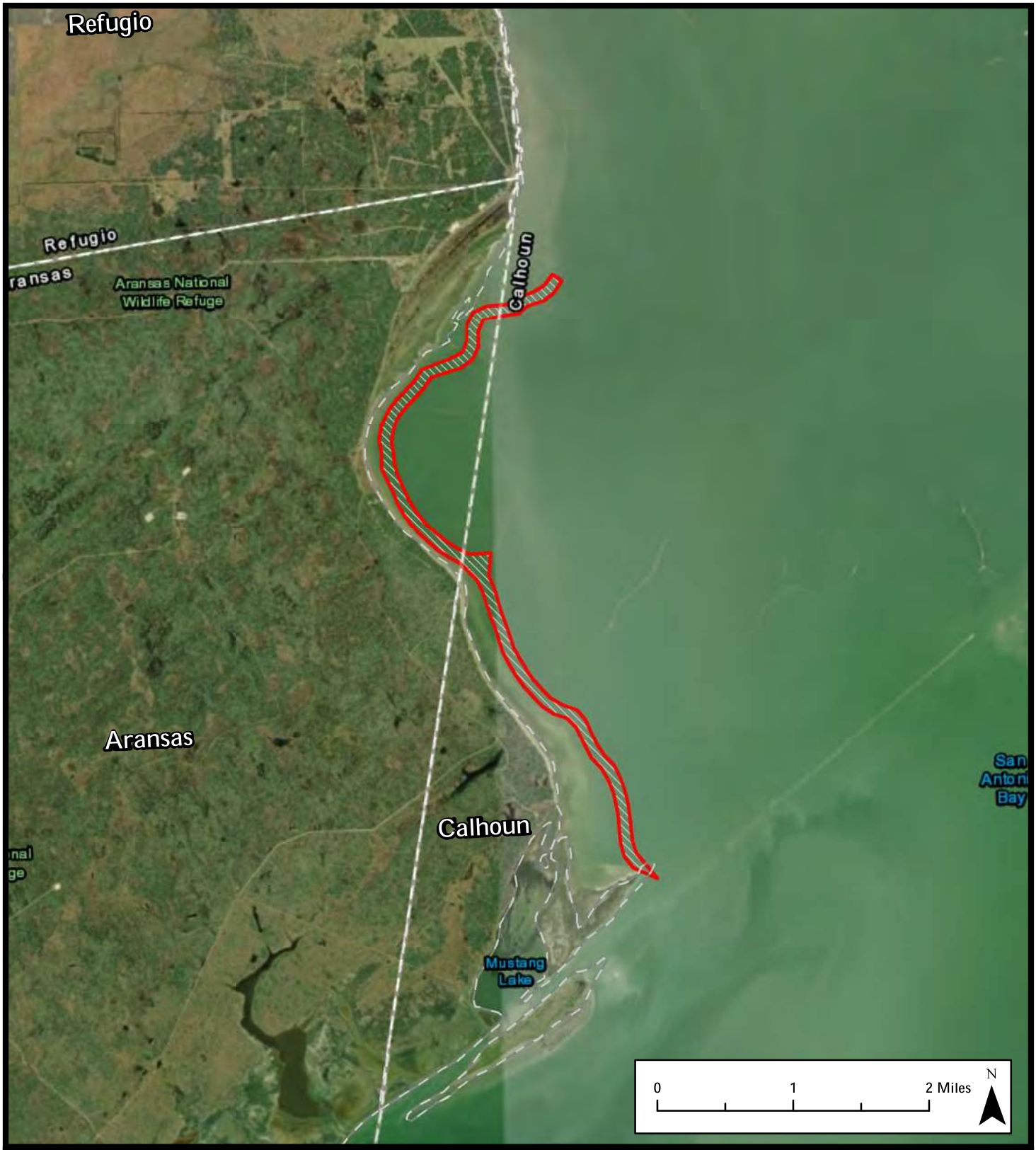
- Project Site
- County Boundary
- Highway
- Road

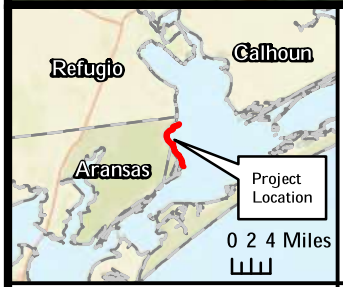
Prepared by:

ANCHOR QEA

Figure 1.0
Vicinity
Aransas County, Texas

Project: Dagger Point Marine Surveys	Project No: 2735	Date Drawn: 5/11/2020	Source: ESRI World Street Map	Scale: 1 in = 5 miles	Projection: NAD 1983 StatePlane Texas South Central FIPS 4204 Feet	Drawn by: JG





Legend

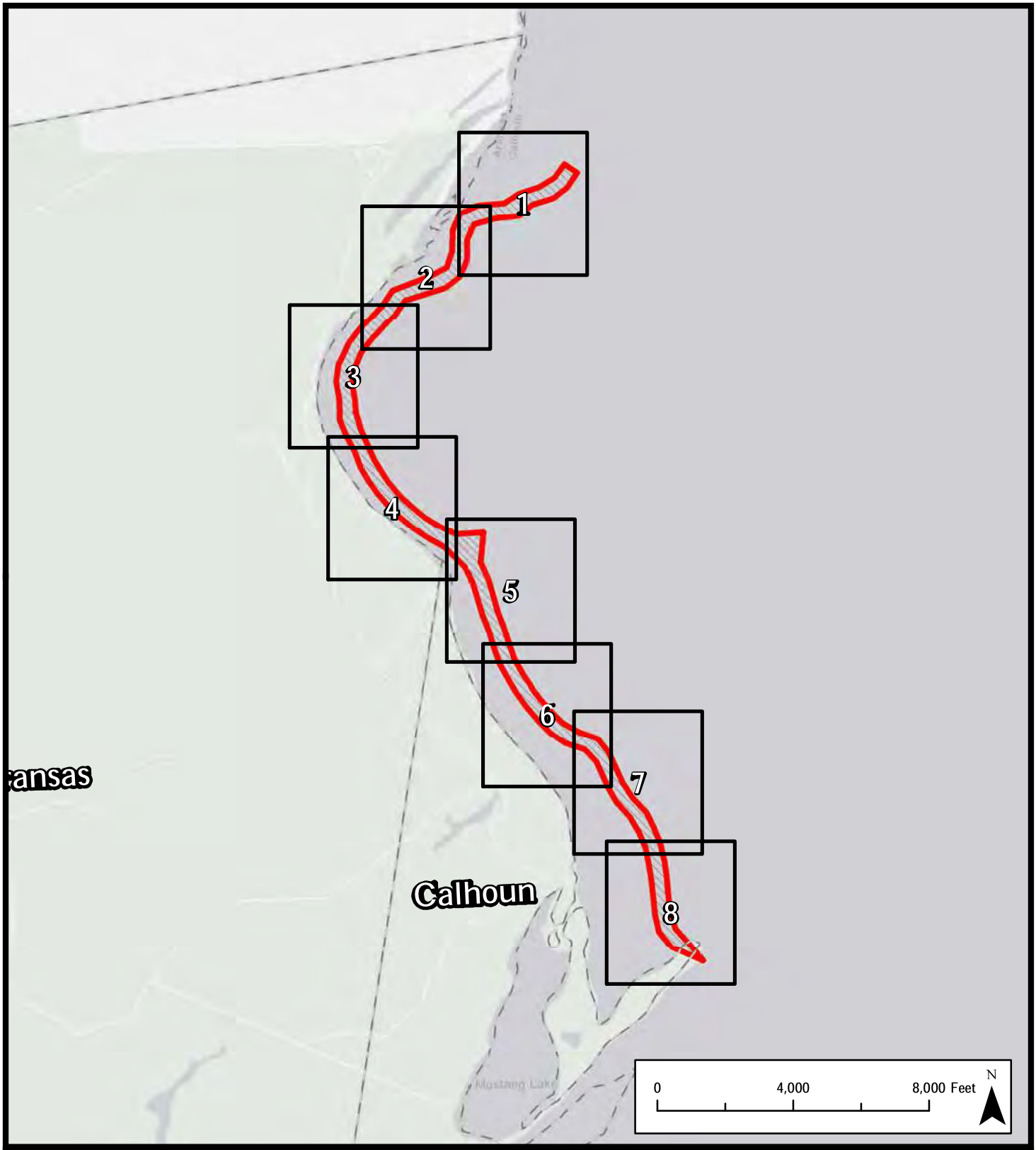
- Project Site
- County Boundary

Prepared by:

ANCHOR QEA

Figure 2.0
Location
Aransas County, Texas

Project: Dagger Point Marine Surveys	Project No: 2735	Date Drawn: 5/11/2020	Source: ESRI World Imagery	Scale: 1 in = 1 miles	Projection: NAD 1983 StatePlane Texas South Central FIPS 4204 Feet	Drawn by: JG



Legend

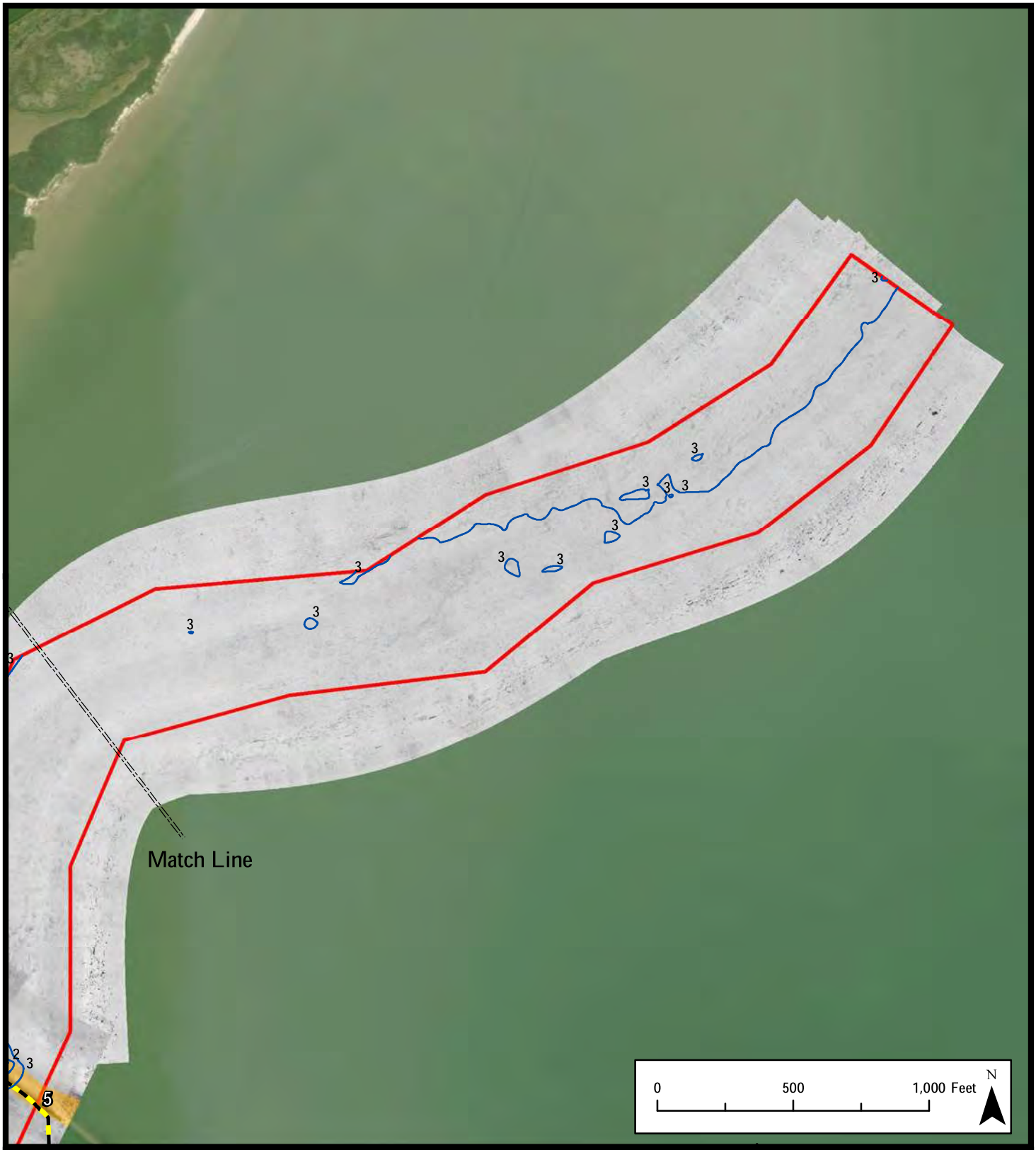
- Survey Corridor
- County Boundary
- Map Sheet Index

Prepared by:

ANCHOR QEA

Figure 3.0
Marine Natural Resource
Map Sheet Index
Aransas County, Texas

Project: Dagger Point Marine Surveys	Project No: 2735	Date Drawn: 5/11/2020	Source: ESRI	Scale: 1 in = 4,000 feet	Projection: NAD 1983 StatePlane Texas South Central FIPS 4204 Feet	Drawn by: JG



Legend

- Survey Corridor
- 1.0-ft Depth Contour*
- Oyster Reefs
- Dredge Tow Lines
- Match Lines

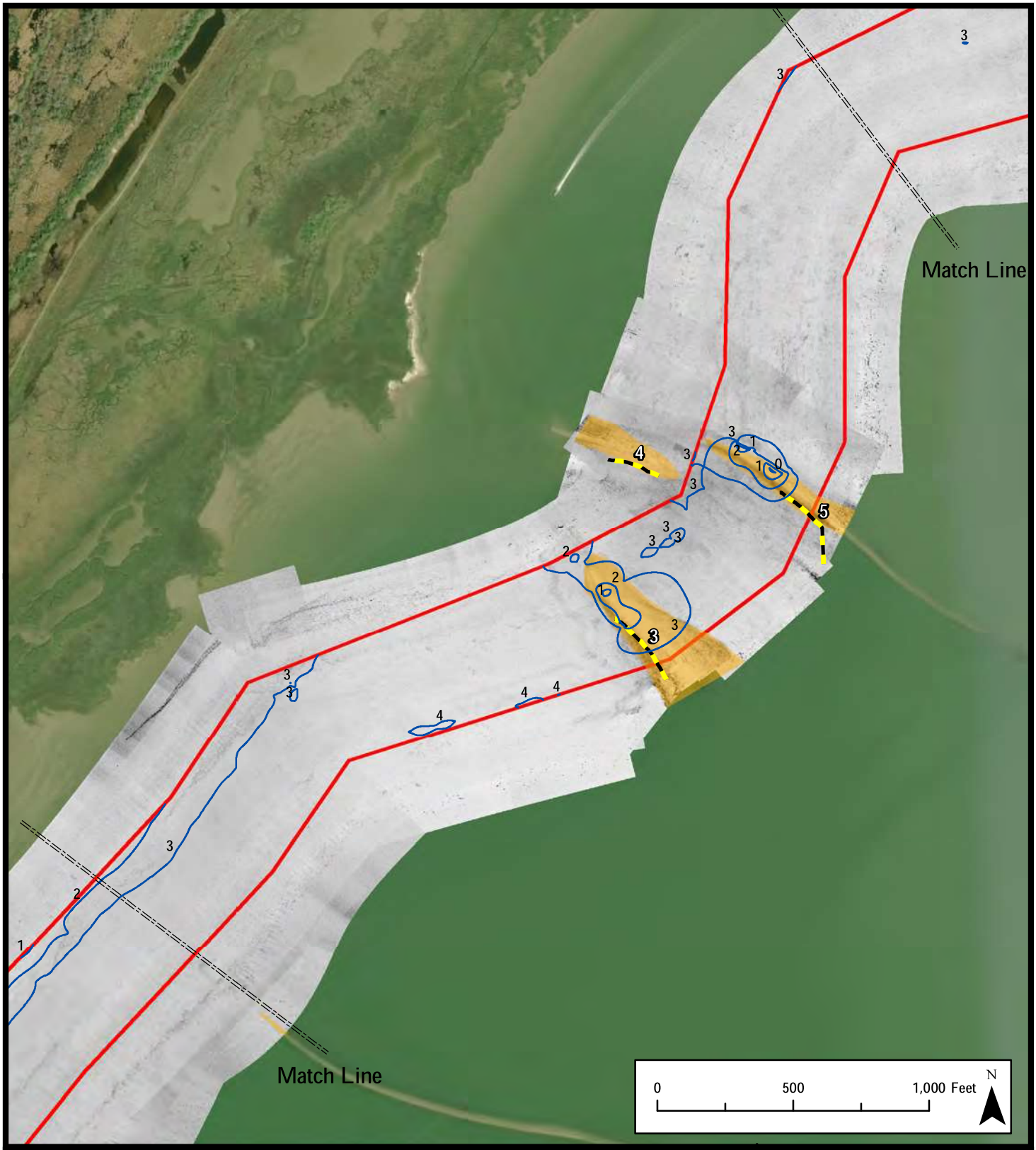
**Bathymetric corrections were performed with verified NOAA Water Level data. Contours were generated by interpolation of point measurments, and should not be iused for engineering purposes.*

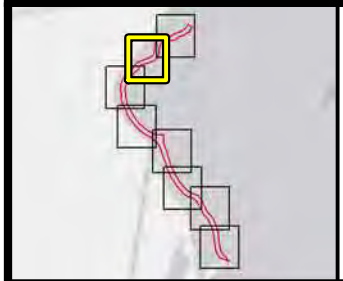
Prepared by:

ANCHOR QEA

Figure 3.1
Marine Natural Resources
Map Sheet 1 of 8
Aransas County, Texas

Project: Dagger Point Marine Surveys	Project No: 2735	Date Drawn: 5/22/2020	Source: ESRI World Imagery	Scale: 1 in = 500 feet	Projection: NAD 1983 StatePlane Texas South Central FIPS 4204 Feet	Drawn by: JG





Legend

- Survey Corridor
- 1.0-ft Depth Contour*
- Oyster Reefs
- Dredge Tow Lines
- Match Lines

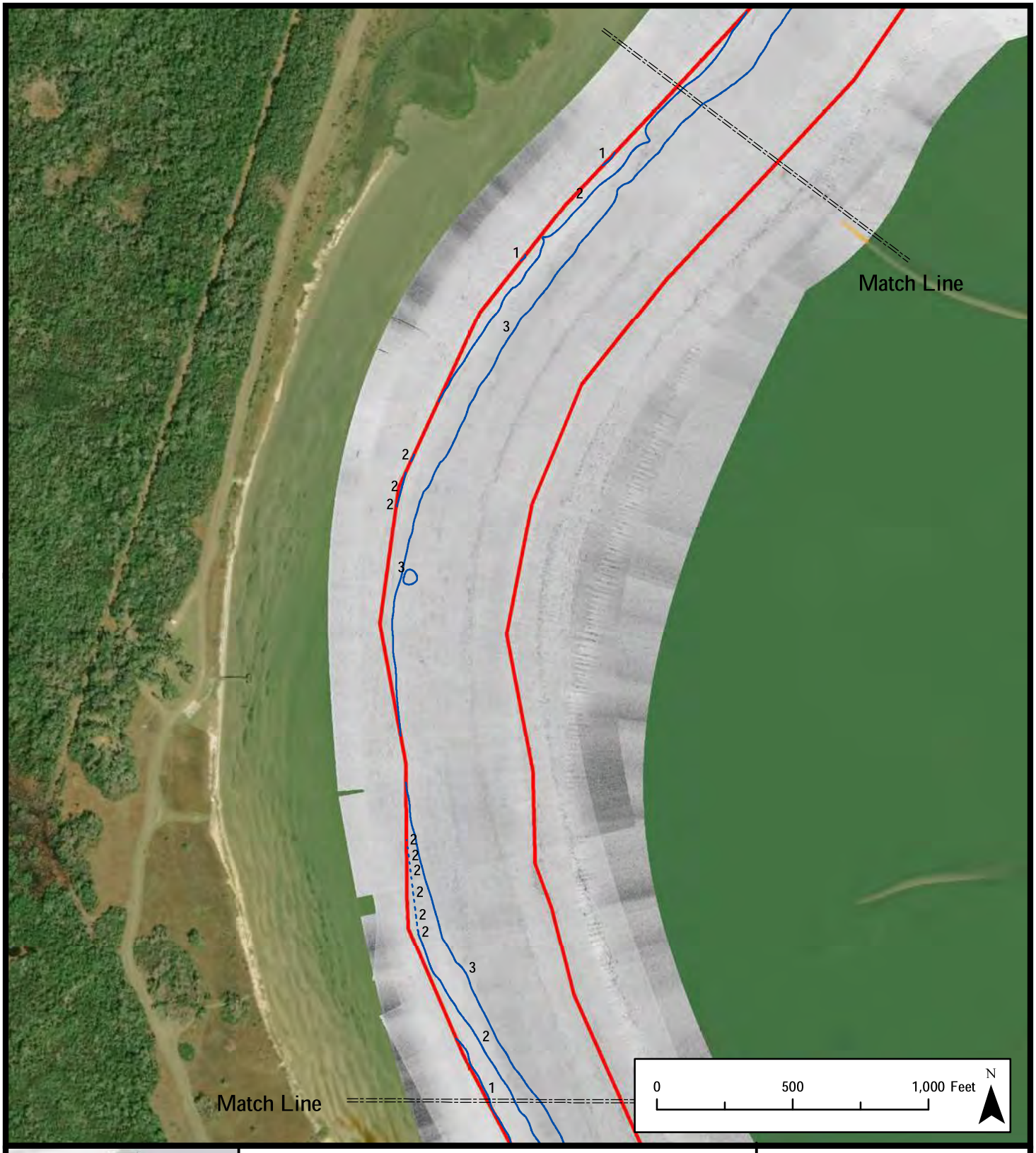
*Bathymetric corrections were performed with verified NOAA Water Level data. Contours were generated by interpolation of point measurments, and should not be iused for engineering purposes.

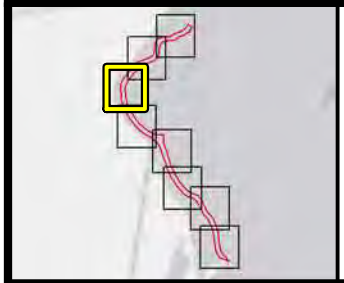
Prepared by: BIO-WEST

ANCHOR QEA

Figure 3.2
Marine Natural Resources
Map Sheet 2 of 8
Aransas County, Texas

Project: Dagger Point Marine Surveys	Project No: 2735	Date Drawn: 5/22/2020	Source: ESRI World Imagery	Scale: 1 in = 500 feet	Projection: NAD 1983 StatePlane Texas South Central FIPS 4204 Feet	Drawn by: JG





Legend

- Survey Corridor
- 1.0-ft Depth Contour*
- Oyster Reefs
- Match Lines

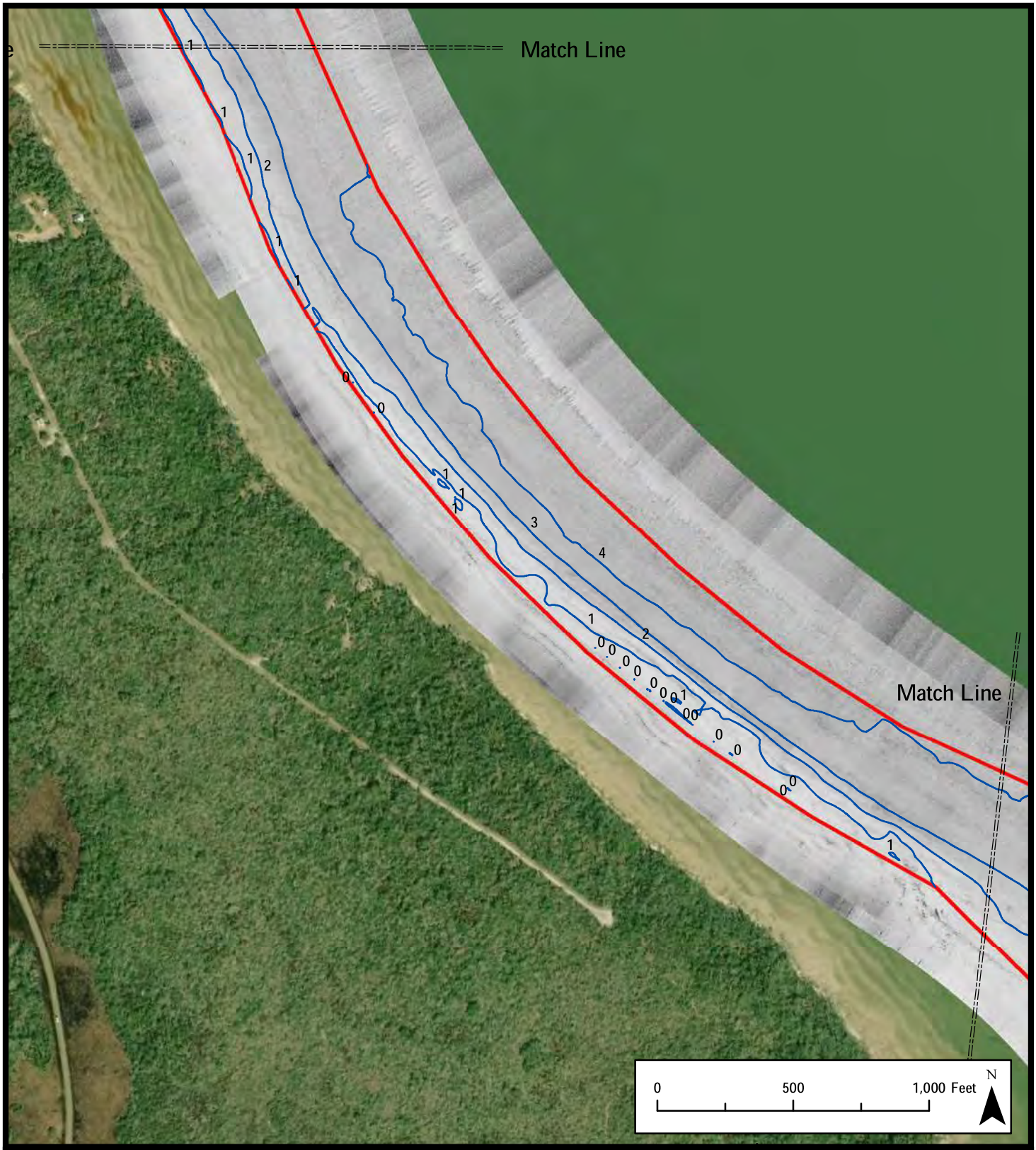
*Bathymetric corrections were performed with verified NOAA Water Level data. Contours were generated by interpolation of point measurments, and should not be iused for engineering purposes.

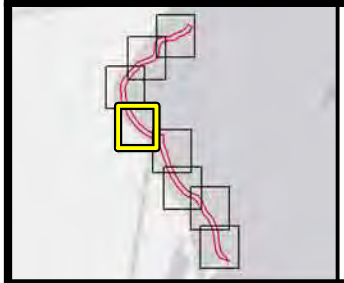
Prepared by: BIO-WEST

ANCHOR QEA

Figure 3.3
Marine Natural Resources
Map Sheet 3 of 8
Aransas County, Texas

Project: Dagger Point Marine Surveys	Project No: 2735	Date Drawn: 5/22/2020	Source: ESRI World Imagery	Scale: 1 in = 500 feet	Projection: NAD 1983 StatePlane Texas South Central FIPS 4204 Feet	Drawn by: JG





Legend

- Survey Corridor
- 1.0-ft Depth Contour*
- Match Lines

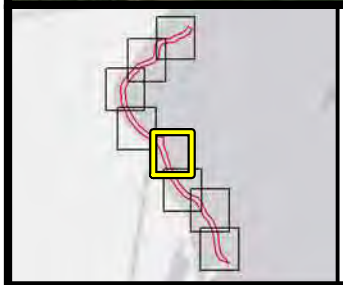
*Bathymetric corrections were performed with verified NOAA Water Level data. Contours were generated by interpolation of point measurments, and should not be iused for engineering purposes.

Prepared by: BIO-WEST

ANCHOR QEA

Figure 3.4
Marine Natural Resources
Map Sheet 4 of 8
Aransas County, Texas

Project: Dagger Point Marine Surveys	Project No: 2735	Date Drawn: 5/22/2020	Source: ESRI World Imagery	Scale: 1 in = 500 feet	Projection: NAD 1983 StatePlane Texas South Central FIPS 4204 Feet	Drawn by: JG



Legend

- Survey Corridor
- 1.0-ft Depth Contour*
- Oyster Reefs
- Dredge Tow Lines
- Seagrass Sampling Point
- Match Lines

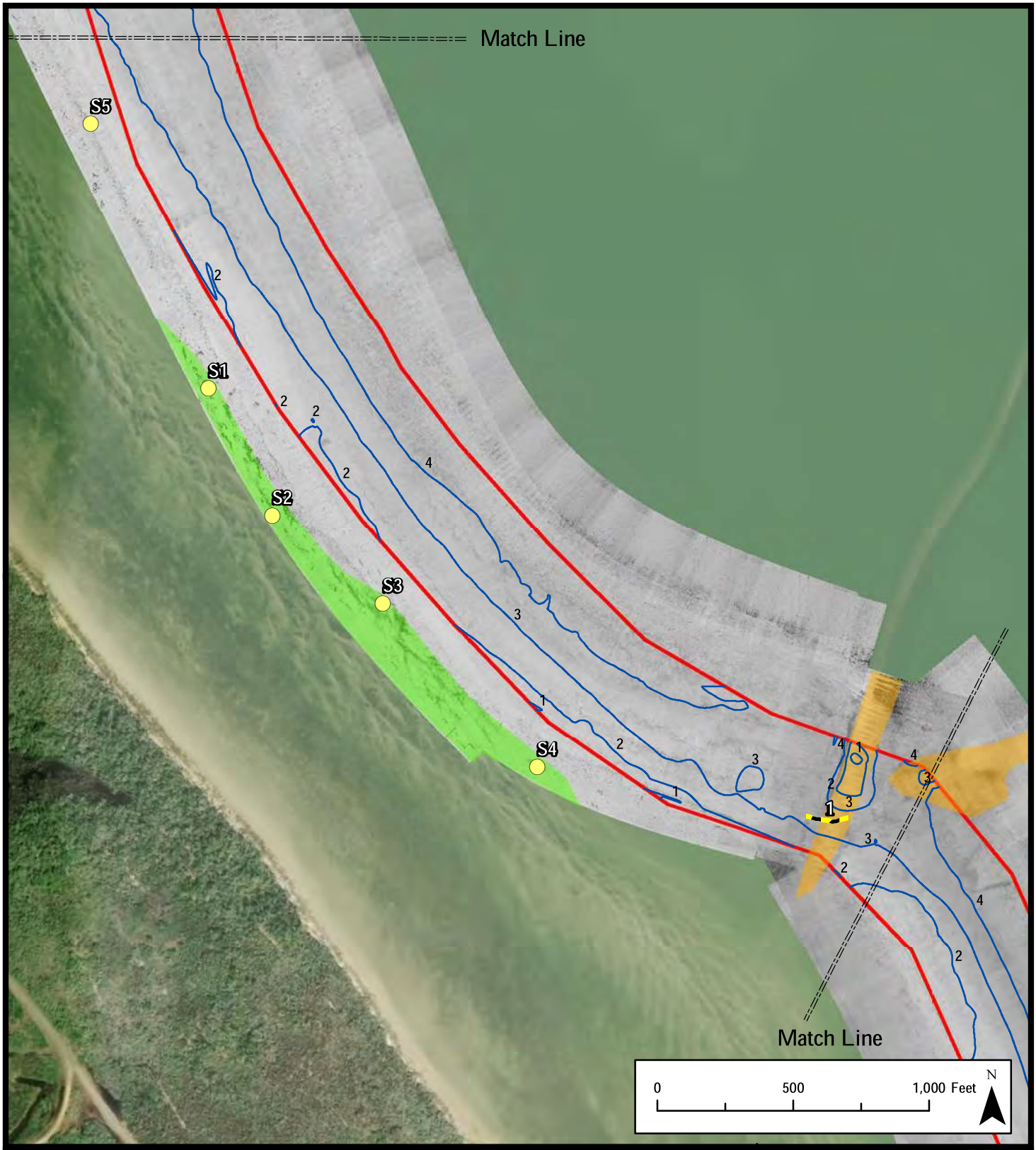
*Bathymetric corrections were performed with verified NOAA Water Level data. Contours were generated by interpolation of point measurments, and should not be iused for engineering purposes.

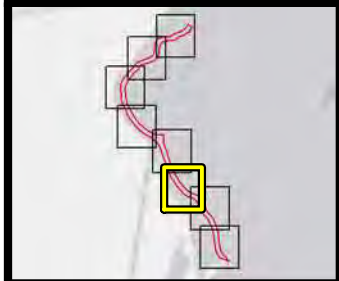
Prepared by:

ANCHOR QEA

Figure 3.5
Marine Natural Resources
Map Sheet 5 of 8
Aransas County, Texas

Project: Dagger Point Marine Surveys	Project No: 2735	Date Drawn: 5/22/2020	Source: ESRI World Imagery	Scale: 1 in = 500 feet	Projection: NAD 1983 StatePlane Texas South Central FIPS 4204 Feet	Drawn by: JG





Legend

- Survey Corridor
- 1.0-ft Depth Contour*
- Oyster Reefs
- Seagrass Beds
- Dredge Tow Lines
- Seagrass Sampling Point
- Match Lines

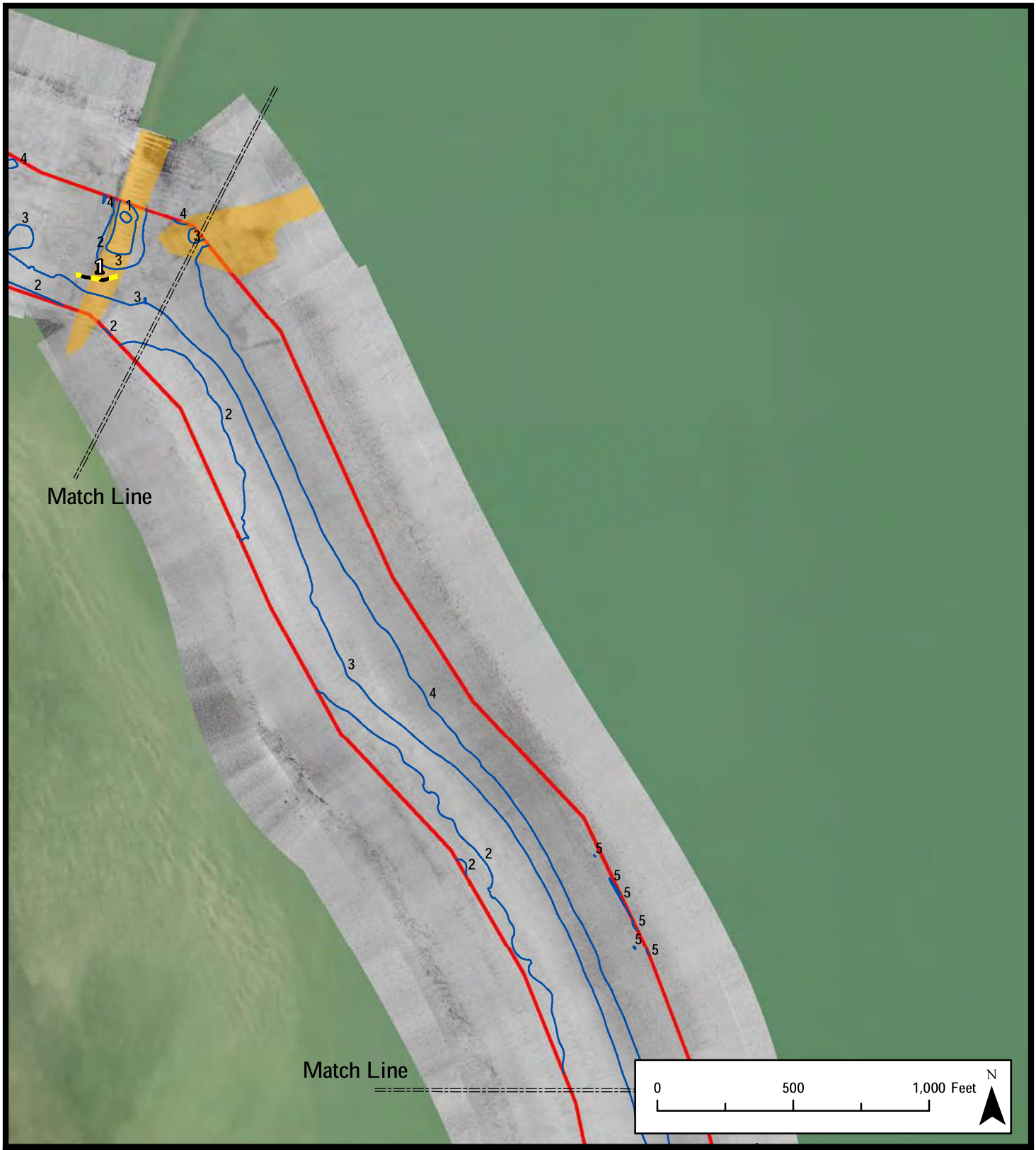
*Bathymetric corrections were performed with verified NOAA Water Level data. Contours were generated by interpolation of point measurments, and should not be iused for engineering purposes.

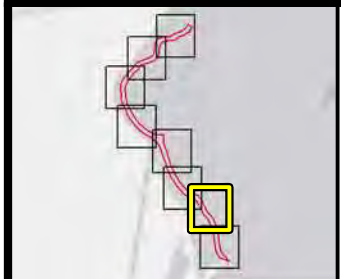
Prepared by: BIO-WEST

ANCHOR QEA

Figure 3.6
Marine Natural Resources
Map Sheet 6 of 8
Aransas County, Texas

Project: Dagger Point Marine Surveys	Project No: 2735	Date Drawn: 5/22/2020	Source: ESRI World Imagery	Scale: 1 in = 500 feet	Projection: NAD 1983 StatePlane Texas South Central FIPS 4204 Feet	Drawn by: JG





Legend

- Survey Corridor
- 1.0-ft Depth Contour*
- Oyster Reefs
- Dredge Tow Lines
- Match Lines

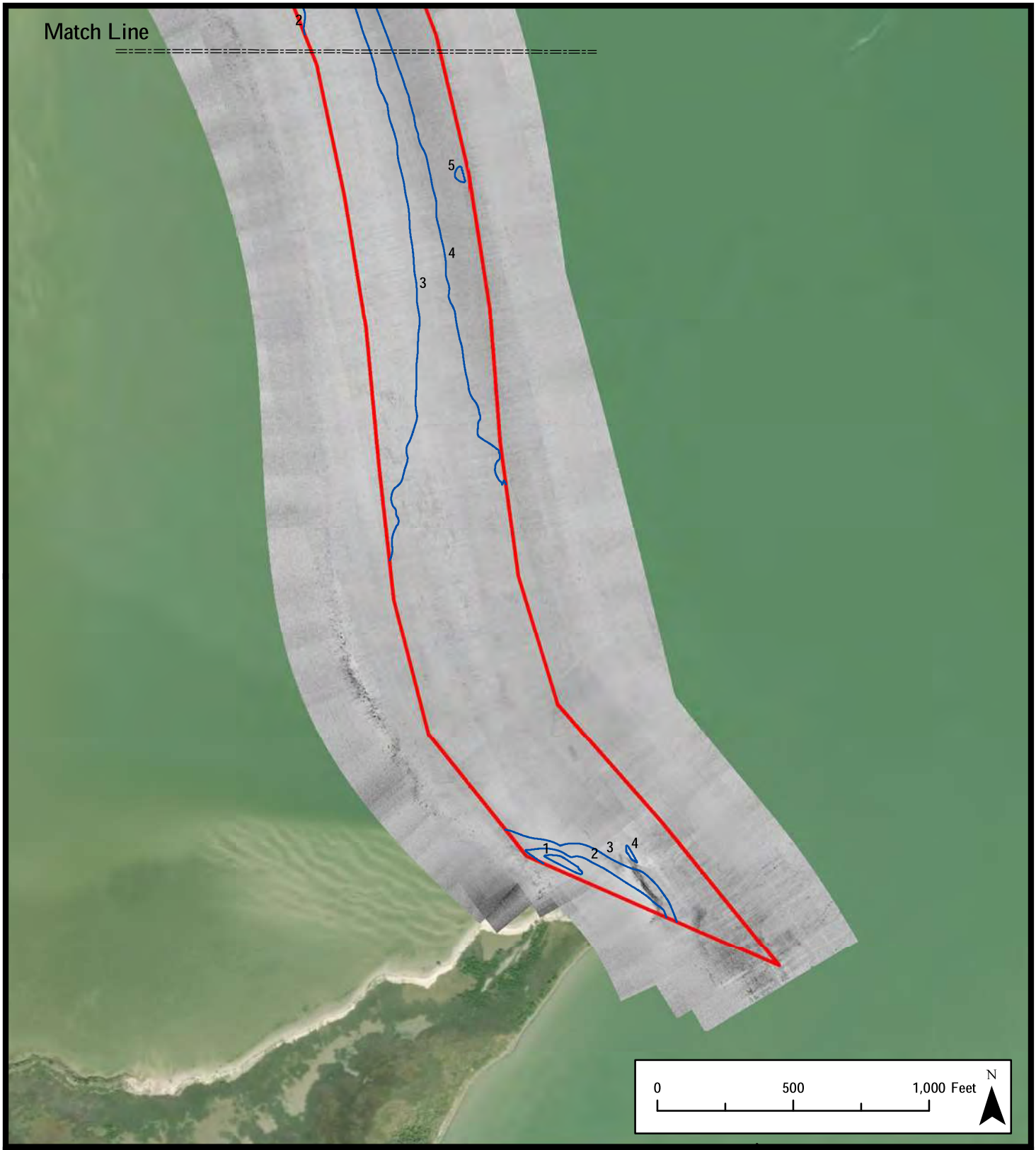
*Bathymetric corrections were performed with verified NOAA Water Level data. Contours were generated by interpolation of point measurments, and should not be iused for engineering purposes.

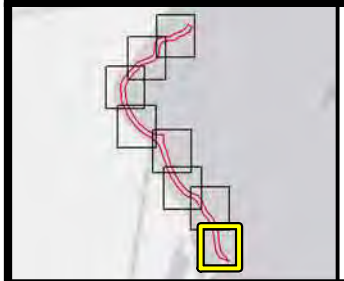
Prepared by: BIO-WEST

ANCHOR QEA

Figure 3.7
Marine Natural Resources
Map Sheet 7 of 8
Aransas County, Texas

Project: Dagger Point Marine Surveys	Project No: 2735	Date Drawn: 5/22/2020	Source: ESRI World Imagery	Scale: 1 in = 500 feet	Projection: NAD 1983 StatePlane Texas South Central FIPS 4204 Feet	Drawn by: JG





Legend

- Survey Corridor
- 1.0-ft Depth Contour*
- Match Lines

*Bathymetric corrections were performed with verified NOAA Water Level data. Contours were generated by interpolation of point measurments, and should not be iused for engineering purposes.

Prepared by: BIO-WEST

ANCHOR QEA

Figure 3.8
Marine Natural Resources
Map Sheet 8 of 8
Aransas County, Texas

Project: Dagger Point Marine Surveys	Project No: 2735	Date Drawn: 5/22/2020	Source: ESRI World Imagery	Scale: 1 in = 500 feet	Projection: NAD 1983 StatePlane Texas South Central FIPS 4204 Feet	Drawn by: JG

Appendix B

Photograph Log of Field Surveys

Photo 1: Dredge Tow #1 – pre-rinse.

Photo 2: Dredge Tow #1 – post-rinse.

Marine Natural Resource Surveys
Proposed Living Shoreline Project
Aransas County, Texas

Project No: 2735	BIO-WEST
Photo Date: 4/21/22	118 Frost Street, Rosenberg, Texas 77471

Photo 3: Dredge Tow #2 – pre-rinse.

Photo 4: Dredge Tow #2 – post-rinse.

Marine Natural Resource Surveys
Proposed Living Shoreline Project
Aransas County, Texas

Project No: 2735	BIO-WEST
Photo Date: 4/21/22	118 Frost Street, Rosenberg, Texas 77471

Photo 5: Dredge Tow #3 – pre-rinse.

Photo 6: Dredge Tow #3 – post-rinse.

Marine Natural Resource Surveys
Proposed Living Shoreline Project
Aransas County, Texas

Project No: 2735

Photo Date: 4/21/22

BIO-WEST
118 Frost Street, Rosenberg, Texas 77471

Photo 7: Dredge Tow #4 – pre-rinse.

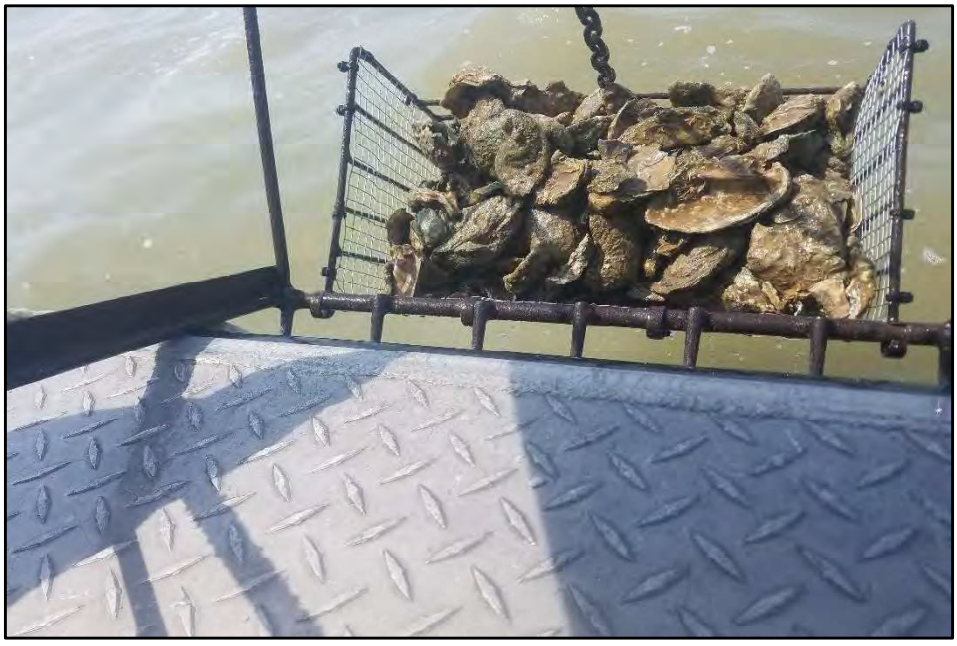


Photo 8: Dredge Tow #4 – post-rinse.

Marine Natural Resource Surveys
Proposed Living Shoreline Project
Aransas County, Texas

Project No: 2735

Photo Date: 4/21/22

BIO-WEST
118 Frost Street, Rosenberg, Texas 77471

Photo 9: Dredge Tow #5 – pre-rinse.

Photo 1: Dredge Tow #5 post-rinse.

Marine Natural Resource Surveys
Proposed Living Shoreline Project
Aransas County, Texas

Project No: 2735	BIO-WEST
Photo Date: 4/21/22	118 Frost Street, Rosenberg, Texas 77471

Photo 11: Seagrass Sample #1 – pre-rinse.

Photo 12: Seagrass Sample #1 post-rinse.

Photo 13: Seagrass Sample #2 – pre-rinse.

Photo 14: Seagrass Sample #2 post-rinse.

Photo 15: Seagrass Sample #3 – pre-rinse.

Photo 16: Seagrass Sample #3 post-rinse.

Photo 17: Seagrass Sample #4 – pre-rinse.

Photo 18: Seagrass Sample #4 post-rinse.

Appendix C

Oyster Dredge Tow Data Sheet

30-second Oyster Dredge Tows

Field Personnel: M. Chastain, J. Oliver, M. Jacobus

Date: 04/21/2020

Sample Site	Time (24 hr)		Photographs		Notes	Live Oysters	Coordinates (WGS 1984)	
	Start	End	Pre-rinse	Post-rinse			Start	End
1	14:24	14:25	142610	142727	Crabs, Barnacles, Worms	34	28.261723, -96.785947	28.261702, -96.785459
2	14:39	14:40	144045	144204	Barnacles, Hook mussels, Worms, Seaweed	20	28.278786, -96.795185	28.278667, -96.794551
3	14:50	14:51	145233	145311	Barnacles, Hook mussels, Worms	6	28.299367, -96.798367	28.298746, -96.797792
4	14:57	14:58	145910	150130	Barnacles, Hook mussels, Worms	27	28.300982, -96.798413	28.300808, -96.797836
5	15:03	15:04	150504	150624	Barnacles, Hook mussels, Worms	21	28.300617, -96.796455	28.299885, -96.795971

Appendix D

Seagrass Survey Data Sheets

Seagrass Survey Data Form

Project: 2735 Proposed Living Shoreline Project
Names: M. Chastain, J. Oliver, T. Dillard, M. Jacobus
Date: 04/21/2020

Weather Conditions: Sunny
Water Conditions: Choppy
Tide Conditions: Rising

Seagrass Bed Id No.	Water Depth (in)	Quad No.	Speceis	Substrate Composition	1 m^2 Percent Cover Estimate	Eckman Grab Stem Count #1	Eckman Grab Stem Count #2	Eckman Grab Stem Count #3	Average Stems per Eckman Grab	Size of Eckman in cm^2	Stem count per $meter^2$ (@ 100% cover)	Weighted Stem Average per $meter^2$	Size of Eckman in ft^2	Stem count per ft^2 (@ 100% cover)	Weighted Stem Average per ft^2	Comments
1	2.5	1	*Halodule beaudettei*	Sand	10	8	2	6	5.3	232.2576	229.6	23.0	0.25	21.3	2.1	
2	2.6	2	*Halodule beaudettei*	Sand	12	0	18	4	7.3	232.2576	315.7	37.9	0.25	29.3	3.5	
3	2.6	3	*Halodule beaudettei*	Sand	10	6	10	12	9.3	232.2576	401.9	40.2	0.25	37.3	3.7	
4	2.5	4	*Halodule beaudettei*	Sand	15	18	20	13	17.0	232.2576	731.9	109.8	0.25	68.0	10.2	
5	2.8	5	-	Sand	0	0	0	0	0.0	232.2576	0.0	0.0	0.25	0.0	0.0	
6	3.1	6	-	Sand	0	0	0	0	0.0	232.2576	0.0	0.0	0.25	0.0	0.0	
7	3.2	7	-	Sand	0	0	0	0	0.0	232.2576	0.0	0.0	0.25	0.0	0.0	
Average	**2.4**				**6.7**				**9.8**			**52.7**		**39.0**	**4.9**	

Appendix E

Water Quality Data Sheet

Project: 2735 Proposed Living Shoreline Project

Water Quality

Field Personnel: M. Chastain, J. Oliver, T. Dillard, M. Jacobus

Station ID: Aransas National Wildlife Refuge, TX (8774230)

Climate parameters for 04/21/2020

Weather: Sunny | Wind speed/direction: 6 Kn/SE | Tide Level (MLT)

Water conditions: Choppy | Tide Times: LT 03:41/ HT 18:43 | Tide Station: 8774230

Sample	S1		S2		S3		S4	
	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom
Time	12:15		13:05		13:14		13:36	
Date	21-Apr-20		21-Apr-20		21-Apr-20		21-Apr-20	
Water Depth (ft)	2.5		2.6		2.6		2.5	
Sample Depth (ft)	1.0	2.2	1.2	2.3	1.2	2.3	1.0	2.4
Water Temperature (°C)	25.33	25.48	25.71	25.85	26.01	25.89	26.02	25.97
Conductivity (mS/cm)	32.89	32.27	32.09	32.19	32.20	32.18	32.20	32.15
Salinity (‰)	20.01	19.98	19.99	19.89	19.95	19.90	19.92	19.93
DO (mg/L)	89.94	89.77	95.27	97.35	93.59	94.01	95.91	94.89
pH	7.62	7.69	8.05	8.10	8.16	8.14	8.10	8.11

Climate parameters for 04/08/2020

Weather: AM overcast, PM sunny | Wind speed/direction: 5 Kn/S | Tide Level (MLT)

Water conditions: Calm | Tide Times: LT 03:55/HT 18:10 | Tide Station: 8774230

Sample	S5		S1		S2	
	Surface	Bottom	Surface	Bottom	Surface	Bottom
Time	13:14		7:54		12:48	
Date	21-Apr-20		8-Apr-20		8-Apr-20	
Water Depth (ft)	2.6		4.0		5.0	
Sample Depth (ft)	1.2	2.3	2.0	4.1	1.9	4.5
Water Temperature (°C)	26.01	25.89	22.77	22.27	22.59	21.73
Conductivity (mS/cm)	32.20	32.18	31.54	33.23	41.52	42.19
Salinity (‰)	19.95	19.90	19.66	20.83	26.63	27.13
DO (mg/L)	93.59	94.01	80.75	60.00	84.21	74.40
pH	8.16	8.14	8.55	8.62	8.18	8.11

From: noreply@thc.state.tx.us
To: Michael Brennan; reviews@thc.state.tx.us; Jerry.L.Androy@usace.army.mil
Subject: Section 106 Submission
Date: Tuesday, August 31, 2021 11:37:56 AM

Re: Project Review under Section 106 of the National Historic Preservation Act and/or the Antiquities Code of Texas
THC Tracking #202114529
Date: 08/31/2021
Aransas Pass Breakwater Survey

,TX

Description: Revised Draft Report & Mag/Sonar Files

Dear Michael Brennan:
Thank you for your submittal regarding the above-referenced project. This response represents the comments of the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission (THC), pursuant to review under Section 106 of the National Historic Preservation Act and the Antiquities Code of Texas.

The review staff, led by Amy Borgens, has completed its review and has made the following determinations based on the information submitted for review:

Archeology Comments

- THC/SHPO concurs with information provided for the underwater project area.
- This draft report is acceptable. Please submit a final report: one restricted version with any site location information (if applicable), and one public version with all site location information redacted. To facilitate review and make project information and final reports available through the Texas Archeological Sites Atlas, we appreciate submitting abstracts online at http://xapps.thc.state.tx.us/Abstract and e-mailing survey area shapefiles to archeological_projects@thc.texas.gov if this has not already occurred. Please note that these steps are required for projects conducted under a Texas Antiquities Permit.
- Underwater archeological sites, historic shipwrecks, and/or significant remote-sensing targets are to be avoided and protected from project impacts. If the work was conducted under a Texas Antiquities Permit, required avoidance margins for underwater archeological sites and significant remote-sensing targets must comply with the Texas Administrative Code.

We have the following comments: Thank you for the revisions to the draft report and for

providing high resolution files of the magnetometer and sonar files for review. The Texas Historical Commission (THC) concurs with the report recommendations for avoidance of targets M014, M039, and M059 and approves the revised draft report dated August 2021. Please address these additional concerns as revisions to the final report: (1) on pages 48 – 50, for each target please include its peak-to-peak amplitude and duration. This needs to be presented for the overall target and not the peak amplitude of each individual anomaly comprising the target; (2) in the magnetometer table in Appendix D, please add the unit of measurement (ft. or m) for the distance header fields; (3) the report is missing a separate table that summarizes only the targets recommended for avoidance. This is required in the Texas Administrative Code, Title 13 Part 2, Chapter 28, Rule §28.9: "(8) A table of anomalies and sonar targets recommended for avoidance or investigation, including the positions of those anomalies, or targets, shall be included in the report." The THC communicated with the principal investigator regarding inclusion of this table on July 20, 2021 and provided examples. Please ensure this table, which should be presented as a non-disclosure appendix, occurs in the final report.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If the project changes, or if new historic properties are found, please contact the review staff. If you have any questions concerning our review or if we can be of further assistance, please email the following reviewers: amy.borgens@thc.texas.gov.

This response has been sent through the electronic THC review and compliance system (eTRAC). Submitting your project via eTRAC eliminates mailing delays and allows you to check the status of the review, receive an electronic response, and generate reports on your submissions. For more information, visit http://thc.texas.gov/etrac-system.

Sincerely,

for Mark Wolfe, State Historic Preservation Officer
Executive Director, Texas Historical Commission

Please do not respond to this email.

cc: Jerry.L.Androy@usace.army.mil

TEXAS HISTORICAL COMMISSION

ARTIFACT CURATION FORM

GENERAL INFORMATION

Please Print

Antiquities Permit No.: 9320

Principal Investigator: Raymond Tubby

Agency/Institution/Company: Search, Inc.

Project Name: Dagger Point Coastal & Marine Habitat Protection & Restoration (Search 9320)

Location of Project: Aransas & Calhoun

Approximate Project Date: January 2021

CERTIFICATION OF CURATION

The undersigned verifies that artifacts and documents associated with investigations performed under Antiquities Permit or under federal regulations were delivered to this repository in satisfactory condition and have been accepted for permanent curation.

Signature of Authorized Representative: Rosario Casarez

Please Print

Name of Authorized Representative: Rosario Casarez

Title: Registrar

Name of Curatorial Facility: Texas Archeological Research Laboratory

Date: 11/3/2021

TARL Accession No. TARL2021.0122

Texas Historical Commission
Archeology Division
P.O. Box 12276
Austin, TX 78711-2276
512.463.6096

Heather Young <heather.young@restorethegulf.gov>

RE: USACE Individual Permit SWG-2018-00279 Verification

1 message

Denise Rodgers <Denise.Rodgers@tceq.texas.gov> Tue, Mar 25, 2025 at 9:19 AM
To: "HEINLY, Robert W CIV USARMY CESWG (USA)" <Robert.W.Heinly@usace.army.mil>
Cc: Young Heather <heather.young@restorethegulf.gov>, Lauren Whitehurst <Lauren.Whitehurst@tceq.texas.gov>

Thanks so much, Bob! Please let me know if there is anything I can do to assist you.

Respectfully,

Denise Rodgers

RESTORE PROGRAM ENVIRONMENTAL COMPLIANCE COORDINATOR

Texas Commission on Environmental Quality

RESTORE Act Program

General Law Division, MC 173

Denise.Rodgers@tceq.texas.gov

512.855.3782

From: HEINLY, Robert W CIV USARMY CESWG (USA) <Robert.W.Heinly@usace.army.mil>
Sent: Tuesday, March 25, 2025 9:16 AM
To: Denise Rodgers <Denise.Rodgers@tceq.texas.gov>
Cc: Young Heather <heather.young@restorethegulf.gov>; Lauren Whitehurst <Lauren.Whitehurst@tceq.texas.gov>
Subject: RE: USACE Individual Permit SWG-2018-00279 Verification

Denise, looked in our system and that permit is good. We did the review and finalized those plans on the date in the letter. Let me know if you need anything else. Thanks!

Bob Heinly

Chief, Policy Analysis Branch

Regulatory Division
Galveston District Army Corps of Engineers

(409)766-3992

From: Denise Rodgers <Denise.Rodgers@tceq.texas.gov>
Sent: Monday, March 24, 2025 3:05 PM
To: HEINLY, Robert W CIV USARMY CESWG (USA) <Robert.W.Heinly@usace.army.mil>
Cc: Young Heather <heather.young@restorethegulf.gov>; Lauren Whitehurst <Lauren.Whitehurst@tceq.texas.gov>
Subject: [Non-DoD Source] USACE Individual Permit SWG-2018-00279 Verification

It was a pleasure to speak with you this afternoon!

I am attaching a copy of the two documents that were presented on behalf of a RESTORE Council funded project to verify the proper environmental authorizations had been obtained. The cover letter has a Text box signature with your name (text box above Krisit McMillan's name). The permit document also does not have a signature block, nor date, nor is it locked. I was also unable to locate the decision document on the USACE website. (I am glad to know that it is possibly a matter of a little housekeeping…)

At your earliest convenience, could you please verify that the attached permit (SWG-2018-00279) has been issued? An email verification would be sufficient for our program as we could use it for auditing purposes. I have included Heather and Lauren as they are the other two working this project that will ultimately need this verification.

Thanks in advance and please let me know if I might be of any assistance.

Sincerely,

Denise Rodgers

RESTORE PROGRAM ENVIRONMENTAL COMPLIANCE COORDINATOR

Texas Commission on Environmental Quality

RESTORE Act Program

General Law Division, MC 173

Denise.Rodgers@tceq.texas.gov

512.855.3782

Heather Young <heather.young@restorethegulf.gov>

Re: EFH review SWG-2018-00279 Dagger Point

1 message

charrish stevens - NOAA Federal <charrish.stevens@noaa.gov> Tue, Apr 8, 2025 at 10:31 AM
To: Heather Young <heather.young@restorethegulf.gov>

Good morning Heather,
I did review this permit back in June of 2022 and provided a No Objection response to the project. I, however, do not keep a formal record of the No Objection or No EFH responses as it is not required. It is in our ECO database but they did not upload the email, only stated what the response we had. I bet USFWS has a copy for their records though.

Charrish Stevens
Fishery Biologist
Habitat Conservation Division
NOAA National Marine Fisheries Service
4700 Ave U, Galveston, TX 77551

Currently Teleworking contact at
Mobile Number: 713-715-9613

Office Ph: (409) 766-3699
Fax: (409) 766-3575
Email: charrish.stevens@noaa.gov

On Mon, Apr 7, 2025 at 3:14 PM Heather Young <heather.young@restorethegulf.gov> wrote:

> Hi Charrish,
> TX has requested RESTORE B2 funding for the USFWS's Dagger Point Shoreline stabilization project located along the eroding shoreline of ANWR in San Antonio Bay. The issued permit is attached. Did you complete an EFH review or submit a letter of no objection? If so, can you please provide a copy for our environmental compliance files ?
> Thanks!
> Heather
> --
> Heather D. Young
>
> Senior Advisor for Ecosystem Restoration and Environmental Compliance
> Gulf Coast Ecosystem Restoration Council
> tel. 504-252-7716
> www.restorethegulf.gov

TEXAS GENERAL LAND OFFICE

COASTAL LEASE NO. CL20220002

By virtue of the authority granted by Chapter 33 of the Texas Natural Resources Code, Title 31 of the Texas Administrative Code, all amendments thereto, all other applicable statutes, and subject to all rules and regulations promulgated pursuant thereto, the State of Texas (the "Grantor"), acting by and through the Commissioner of the General Land Office (the "GLO") as Chairwoman of the School Land Board (the "Board) on behalf of the Permanent School Fund (the "PSF"), hereby grants to the grantee (the "Grantee") named under the "Grantee Name" section of **Attachment A**, the Control Page, the right to use a tract of state-owned real property (the "Premises"), which property is described in the "Premises" section of **Attachment A** and further depicted in **Attachment B**, for the purposes described in this agreement (the "Agreement").

ARTICLE I: INTERPRETIVE PROVISIONS

(a) The meanings of defined terms are equally applicable to the singular and plural forms of the defined terms;

(b) The words "hereof," "herein," "hereunder," and similar words refer to this Agreement as a whole and not to any particular provision, section, Attachment, or schedule, unless otherwise specified;

(c) The term "including" is not limiting and means "including without limitation" and, unless otherwise expressly provided in this Agreement, (i) references to agreements (including this Agreement) and other contractual instruments shall be deemed to include all subsequent amendments and other modifications thereto, but only to the extent that such amendments and other modifications are not prohibited by the terms of this Agreement; and (ii) references to any statute or regulation are to be construed as including all statutory and regulatory provisions consolidating, amending, replacing, supplementing, or interpreting the statute or regulation;

(d) The captions and headings of this Agreement are for convenience of reference only and shall not affect the interpretation of this Agreement;

(e) All attachments within this Agreement, including those referenced by incorporation, and any amendments are considered part of the terms of this Agreement;

(f) This Agreement may use several different limitations, regulations, or policies to regulate the same or similar matters. All such limitations, regulations, and policies are cumulative and each shall be performed in accordance with its terms;

(g) Unless otherwise expressly provided, reference to any action of the Grantor or by the Grantor by way of consent, approval, or waiver shall be deemed modified by the phrase "in its/their sole discretion." Notwithstanding the preceding sentence, any approval, consent, or waiver required by, or requested of, the Grantor shall not be unreasonably withheld or delayed;

(h) All due dates and/or deadlines referenced in this Agreement that occur on a weekend or holiday shall be considered as if occurring on the next business day;

(i) All time periods in this Agreement shall commence on the day after the date on which the applicable event occurred, report is submitted, or request is received; and

(j) Time is of the essence in this Agreement.

ARTICLE II: GRANTING CLAUSE

2.01 GRANTING CLAUSE: IN CONSIDERATION OF THE PAYMENTS STATED IN ARTICLE IV OF THIS AGREEMENT AND OTHER CONSIDERATION STATED THEREIN, THE RECEIPT AND SUFFICIENCY OF WHICH ARE HEREBY ACKNOWLEDGED, AND ACCORDING TO THE COVENANTS AND COMMITMENTS HEREIN AGREED TO BE KEPT AND PERFORMED BY THE GRANTEE, THE GRANTOR GRANTS TO THE GRANTEE THE RIGHT TO USE THE PREMISES FOR THE PURPOSES AND UNDER THE CONDITIONS AND OBLIGATIONS DESCRIBED IN THE FOLLOWING SECTION OF THIS AGREEMENT.

2.02 SCOPE OF GRANTING CLAUSE: THE GRANTEE'S USE OF THE PREMISES IS SUBJECT TO COMPLIANCE WITH THE FOLLOWING COVENANTS, OBLIGATIONS, AND CONDITIONS:

(a) Use: The Premises may be used by the Grantee solely for those uses specified under the "Use(s) of Premises" section of **Attachment A** and for no other purpose. Except as otherwise provided in this Agreement, the Premises are to remain in their current topographical and hydrologic condition during the term of the Agreement. The Grantee is specifically prohibited from modifying the Premises in any manner not authorized in this Agreement and from using, or allowing the use by others, of the Premises for any other purpose.

(b) Trash: The Grantee shall be responsible for the removal and disposal of all trash at the Premises, whether or not such trash is generated by the Grantee or its guests and invitees.

(c) Improvements:

(i) The Grantee's right to use the Premises is exclusive as to those alterations, additions, and/or improvements located, or to be located, on the Premises (collectively the "Improvements"), as more specifically described under the "Use(s) of Premises" section of **Attachment A** and further depicted on **Attachment B**, and non-exclusive as to the remainder. The location of the Improvements shall become fixed as specified under **Attachment B** and shall not be changed except by a written amendment to this Agreement. Improvements existing prior to the execution of this Agreement are and shall remain the property of the Grantor;

(ii) Except as otherwise allowed in this Agreement, no construction, land modifications or excavation, or permanent property improvements may be allowed or undertaken without the Grantor's prior express written consent. The Grantee may not maintain or allow any nuisances or public hazards on the Premises, and shall be under a duty to abate or remove any activity or property constituting or contributing to a hazard or nuisance. The Grantee may file a criminal complaint or institute civil proceedings to protect his right of possession and leasehold interest in the Premises against trespass of other infringement of the Grantee's rights by third parties. The Grantee is specifically prohibited from using or allowing the use by others of the Premises for any purpose not stated herein, including, but not limited to, mining, hauling, or otherwise removing rock, sand, gravel, aggregate, or other such materials, without the Grantor's prior express written approval;

(iii) Prior to undertaking construction or installation of Improvements on the Premises, the Grantee shall provide written notice of the terms of this Agreement to each person or entity authorized by the Grantee to perform any such activity on its behalf. If a dispute arises concerning construction or installation of the Improvements, the Grantee shall provide the Grantor with a copy of all applicable notices within ten (10) days of the Grantor's written request;

(iv) The Grantee, in its sole cost and expense, shall make, and be solely responsible for, any repairs, maintenance, or replacements to the Improvements that the Grantor considers necessary or as required by this Agreement. If the Grantee fails or refuses to honor such a request, or in case of an emergency, the Grantor may make such repairs, maintenance, renewals, or replacements. **THE GRANTEE WAIVES ANY CLAIM FOR DAMAGE CAUSED THEREBY AND IS LIABLE TO THE GRANTOR FOR ANY COSTS INCURRED;**

(v) Prior to expiration of this Agreement or upon notice of termination, the Grantee shall remove all of the Improvements, remove any resulting debris, and pay Grantor all monies due. The grantee shall take whatever measures are necessary to restore the area involved as nearly as practicable to the same condition that existed prior to placement of any Improvements. If the Grantee fails to comply with this provision, the Grantor shall have the right to perform the work, in which event the Grantee shall be liable to the Grantor for all cost, loss, and damage incurred by the Grantor;

(vi) Notwithstanding the preceding, pursuant to Title 31 of the Texas Administrative Code, the Grantor may waive the removal/restoration requirements in this Section if, in the Grantor's sole opinion and discretion, such waiver is in the best interest of the State. Any such waiver shall be in writing and may be conditioned upon factors including the nature and sensitivity of the natural resources in the area, potential damage to or destruction of property, beneficial uses of the existing improvement(s), and other factors considered to be in the best interest of the State; and

(vii) Grantee shall insure that all Improvements constructed, placed, or operated by it on the Premises are visible to operators of marine craft at all times. Grantee shall further take any and all steps necessary to insure that Improvements constructed, placed, or operated by it on the Premises do not constitute a hazard to operators of marine craft. Grantee may not restrict or prevent other persons from access to navigating open, navigable waters.

(d) Adjacent Property:

(i) The Premises are located adjacent to property that is owned by the Grantee or in which the Grantee has a possessory interest (the "Adjacent Property") and is further described under the "Adjacent Property" section of **Attachment A**; and

(ii) If the Grantee is divested of its interest in the Adjacent Property, the Grantor may terminate this Agreement upon ten (10) days written notice to the Grantee.

(e) Special Conditions: The Grantee shall adhere to the special conditions, if any, listed under the "Special Conditions" section of **Attachment A**.

2.03 AS IS: THE GRANTEE HAS INSPECTED THE PHYSICAL AND TOPOGRAPHIC CONDITION OF THE PREMISES AND ACCEPTS THE SAME "AS IS," IN ITS EXISTING PHYSICAL AND TOPOGRAPHIC CONDITION. THE GRANTEE ACKNOWLEDGES THAT IT IS NOT RELYING ON ANY REPRESENTATION, STATEMENT, OR OTHER ASSERTION OF THE GRANTOR WITH RESPECT TO THE CONDITION OF THE PREMISES, BUT IS RELYING ON THE GRANTEE'S OWN INSPECTION OF THE PREMISES. THE GRANTOR DISCLAIMS ANY AND ALL WARRANTIES OF HABITABILITY, MERCHANTABILITY, SUITABILITY, FITNESS FOR ANY PURPOSE, AND ANY OTHER EXPRESS OR IMPLIED WARRANTY NOT EXPRESSLY SETFORTH IN THIS AGREEMENT. THE USE OF THE TERM "GRANT" IN NO WAY IMPLIES THAT THIS AGREEMENT IS FREE OF LIENS, ENCUMBRANCES, AND/OR PRIOR RIGHTS. THE GRANTEE IS PUT ON NOTICE THAT OTHER GRANT AND/OR ENCUMBRANCE MAY BE OF RECORD, AND THE GRANTEE IS ADVISED TO EXAMINE THE RECORDS IN THE ARCHIVES AND RECORDS DIVISION OF THE GLO AND RECORDS OF THE COUNTY IN WHICH THE PREMISES ARE LOCATED.

2.04 RESERVATIONS: THE GRANTOR RESERVES THE FULL USE OF THE PREMISES AND ALL RIGHTS WITH RESPECT TO ITS SURFACE AND SUBSURFACE FOR ANY AND ALL PURPOSES EXCEPT FOR THOSE GRANTED TO THE GRANTEE. THE AFOREMENTIONED RESERVED FULL USE OF THE PREMISES BY THE GRANTOR INCLUDES THE RIGHT OF INGRESS, EGRESS, AND USE OF THE PREMISES BY THE GRANTOR, ITS OFFICERS, AGENTS, REPRESENTATIVES, EMPLOYEES, AND OTHER AUTHORIZED USERS FOR ANY AUTHORIZED PURPOSE.

2.05 RIGHT OF ENTRY

(a) In any circumstances where the Grantor is granted a right of entry on the Premises during the term of the Agreement, no such entry shall constitute an eviction or disturbance of the Grantee's use and possession of the Premises, a breach by the Grantor of any of its obligations hereunder, render the Grantor liable for damages for loss of business or otherwise, entitle the Grantee to be relieved from any of its obligations hereunder, grant the Grantee any right of off-set or recoupment, or other remedy.

(b) In exercising any right of entry, the Grantor agrees to exercise its right of entry only at reasonable times (except in an emergency) for purposes of inspection, repair, and as necessary to protect the State's interests, and the Grantor agrees not to unreasonably interfere with the Grantee's authorized use of the Premises. The Grantee shall provide the Grantor with keys or combinations to all locks that may limit access to the Premises.

(c) Further, the Grantee authorizes the State, its officers, agents, representatives, and employees to access the Premises over and across Grantee's Adjacent Property. Grantor agrees to use the Adjacent Property only to the extent and for the length of time necessary to provide access to and from the Premises. The foregoing authorization creates a license only, and does not create an easement over the Adjacent Property.

(d) Grantee acknowledges that Grantor's right of ingress and egress shall remain in effect as long as any improvements placed on the Premises by Grantee remain on the Premises and/or as necessary for Grantor to confirm the removal (in whole or in part) of those improvements.

(e) Any aforementioned right of entry shall survive the termination of this Contract.

2.06 DAMAGE OR DESTRUCTION OF PREMISES AND/OR IMPROVEMENTS: NO DAMAGE TO THE PREMISES, OR DAMAGE TO OR DESTRUCTION OF ANY IMPROVEMENTS, SHALL IN ANY WAY ALTER, AFFECT, OR MODIFY THE GRANTEE'S OBLIGATIONS UNDER THIS AGREEMENT. IN THE EVENT ANY SUCH DAMAGE OR DESTRUCTION EXCEEDS THE COST LISTED UNDER THE "COST OF DAMAGE" SECTION OF **ATTACHMENT A** PER EVENT TO REPAIR, THE GRANTEE SHALL GIVE WRITTEN NOTICE TO GRANTOR WITHIN SEVEN (7) CALENDAR DAYS OF THE DAMAGE OR DESTRUCTION, INCLUDING A DESCRIPTION OF THE DAMAGE OR DESTRUCTION AND, AS FAR AS KNOWN TO THE GRANTEE, THE CAUSE OF THE DAMAGE OR DESTRUCTION. THE GRANTEE SHALL IMMEDIATELY REMOVE ALL DEBRIS RESULTING FROM SUCH

DAMAGE OR DESTRUCTION AND TAKE SUCH ACTION AS IS NECESSARY TO PLACE THE PREMISES IN A NEAT, SAFE CONDITION. WITHIN 90 DAYS OF THE EVENT CAUSING THE DAMAGE OR DESTRUCTION, THE GRANTEE MUST EITHER REPAIR OR REPLACE THE IMPROVEMENTS, IF PERMITTED BY LAW, OR RETURN THE PREMISES TO THEIR NATURAL CONDITION. THE GRANTOR MAY MAKE REPAIRS OR REPLACEMENTS PURSUANT TO THIS SECTION, WHEREUPON THE GRANTEE SHALL BE LIABLE TO PAY THE GRANTOR, UPON DEMAND, THE COST AND EXPENSE INCURRED IN ACCOMPLISHING SUCH ACTION. ANY FAILURE BY THE GRANTEE TO MAKE SUCH PAYMENT TO THE GRANTOR MAY BE TREATED BY THE GRANTOR AS AN EVENT OF DEFAULT.

ARTICLE III: TERM

The effective date and termination date of this Agreement are specified under the "Effective and Termination Dates" section of **Attachment A,** unless renewed or earlier terminated as provided herein. Unless otherwise specified herein, renewal of this Agreement is at the sole discretion of the Grantor.

ARTICLE IV: CONSIDERATION

THE GRANTEE SHALL PAY, IN CONSIDERATION OF THE MUTUAL COVENANTS AND AGREEMENTS SET FORTH IN THIS AGREEMENT, THE PAYMENT(S) AND/OR FEE(S) LISTED UNDER THE "PAYMENT(S) AND/OR FEE(S)" SECTION OF **ATTACHMENT A** ON OR BEFORE THE DUE DATE.

ARTICLE V: EVENTS OF DEFAULT

5.01 EVENTS OF DEFAULT: WITH RESPECT TO THE GRANTEE, IT SHALL BE AN EVENT OF DEFAULT HEREUNDER ("EVENT OF DEFAULT") IF:
(a) the Grantee fails or refuses to timely pay Consideration or any other payments required by this Agreement after it becomes due;
(b) the Grantee fails or refuses to comply, timely perform, or observe any of the covenants, duties, obligations, and/or conditions under this Agreement;
(c) the Grantee abandons or vacates the Improvements, the Premises, or any significant portion thereof;
(d) there is an entry of a court order requiring the dissolution, winding up, or termination of the Grantee's business affairs; or
(e) the Grantee fails to materially comply with rules and regulations in the Texas Administrative Code, the Texas Natural Resources Code, or any other rules or regulations promulgated by any state or federal governmental entity with proper jurisdiction over any of the uses permitted under this Agreement, unless such a failure to comply is redressed through an enforcement action by an applicable state agency with proper jurisdiction.

5.02 NOTICE AND CURE: There shall be no consequences for an Event of Default under this Agreement, unless the defaulting party receives written notice of the Event of Default and such Event of Default continues for a period of 30 days after the defaulting party receives the notice. A notice of Event of Default shall specify the event or events constituting the default. This 30 day period shall be extended if the act, event, or condition is one that by its nature or circumstances reasonably requires more than 30 days to cure; provided, however, the defaulting party shall promptly and in good faith initiate and diligently pursue measures that are expected to cure or eliminate the Event of Default in a reasonable period of time. If either party fails to cure an Event of Default, the non-defaulting party shall be entitled to terminate this Agreement by written notice. This notice and cure provision does not apply to an Event of Default under provision 5.01(a) or any emergency situations that affect public health or safety.

5.03 CUMULATIVE RIGHTS AND REMEDIES; NO WAIVER: IF AN EVENT OF DEFAULT OCCURS AND THE GRANTEE FAILS TO CURE WITHIN THE PERIOD PROVIDED ABOVE, THE GRANTOR MAY, AT ITS OPTION, DO ANY ONE OR MORE OF THE FOLLOWING:

(a) terminate this Agreement by sending written notice of such termination, in which event the Grantee shall immediately surrender possession of the Premises to the Grantor (such termination shall not prejudice the rights of the Grantor for any claim of payments due);

(b) enter upon and take possession of the Premises and expel or remove the Grantee and any other occupant, with or without having terminated the Agreement; or
(c) alter locks and other security devices, if any, at the Premises.

The failure of either the Grantee or the Grantor to insist at any time upon the strict observance or performance of any of the provisions of this Agreement or to exercise any right or remedy as provided in this Agreement shall not impair any other right or remedy or be construed as a waiver or relinquishment thereof with respect to subsequent defaults. Every right and remedy given by this Agreement to the Grantee or the Grantor may be exercised from time-to-time and as often as may be deemed expedient by the Grantee or the Grantor, as the case may be. In an Event of Default, the Grantor shall have the option, but not the obligation, to mitigate its damages.

ARTICLE VI: GENERAL TERMS, CONDITIONS, AND EXCEPTIONS

6.01 ASSIGNMENT: THE GRANTEE SHALL NOT ASSIGN OR OTHERWISE DISPOSE OF AN INTEREST IN THIS AGREEMENT OR THE PREMISES WITHOUT THE EXPRESS PRIOR WRITTEN CONSENT OF THE GRANTOR; AND ANY ATTEMPT TO ASSIGN OR OTHERWISE DISPOSE WITHOUT CONSENT SHALL BE VOID AND OF NO EFFECT. THIS PROHIBITION AGAINST ASSIGNING OR DISPOSITION SHALL BE CONSTRUED TO INCLUDE A PROHIBITION AGAINST ANY ASSIGNMENT OR DISPOSITION BY OPERATION OF LAW. IF THIS AGREEMENT IS ASSIGNED, OR IF AN INTEREST IN THIS AGREEMENT OR THE PREMISES IS DISPOSED OF, THE GRANTOR MAY NEVERTHELESS COLLECT CONSIDERATION FROM THE ASSIGNEE AND APPLY THE NET AMOUNT COLLECTED TO THE CONSIDERATION PAYABLE HEREUNDER. NO SUCH TRANSACTION OR COLLECTION OF CONSIDERATION SHALL RELEASE THE GRANTEE FROM THE FURTHER PERFORMANCE OF ITS COVENANTS, DUTIES, AND OBLIGATIONS.

6.02 INDEMNITY: EXCEPT FOR DAMAGES DIRECTLY OR PROXIMATELY CAUSED BY THE GROSS NEGLIGENCE OF THE GRANTOR, THE GRANTEE SHALL INDEMNIFY AND HOLD HARMLESS THE GRANTOR AND THE GRANTOR'S OFFICERS, REPRESENTATIVES, AGENTS, AND EMPLOYEES FROM ANY LOSSES, CLAIMS, SUITS, ACTIONS, DAMAGES, OR LIABILITY (INCLUDING ALL COSTS AND EXPENSES OF DEFENDING AGAINST ALL OF THE AFOREMENTIONED) ARISING IN CONNECTION WITH:

- **THIS AGREEMENT;**
- **THE USE OR OCCUPANCY OF THE PREMISES;**
- **ANY NEGLIGENCE, ACT, OMISSION, NEGLECT, OR MISCONDUCT OCCURRING IN, ON, OR ABOUT THE PREMISES; OR**
- **ANY CLAIMS OR AMOUNTS ARISING OR RECOVERABLE UNDER FEDERAL OR STATE WORKERS' COMPENSATION LAWS, THE TEXAS TORT CLAIMS ACT, OR ANY OTHER SUCH LAWS.**

THE GRANTEE ASSUMES RESPONSIBILITY FOR THE CONDITION OF THE PREMISES. THE GRANTEE EXPRESSLY AGREES TO USE AND OCCUPY THE PREMISES AND PLACE ANY IMPROVEMENTS ON THE PREMISES AT ITS OWN RISK. THE GRANTEE SHALL BE RESPONSIBLE FOR THE SAFETY AND WELL BEING OF ITS EMPLOYEES, CUSTOMERS, AND INVITEES. THESE REQUIREMENTS SHALL SURVIVE THE TERM OF THIS AGREEMENT UNTIL ALL CLAIMS HAVE BEEN SETTLED OR RESOLVED AND SUITABLE EVIDENCE TO THAT EFFECT HAS BEEN FURNISHED TO THE GRANTOR.

6.03 PROTECTION OF NATURAL AND HISTORICAL RESOURCES
(a) Unauthorized Discharge: The Grantee shall use the highest degree of care and all appropriate safeguards to prevent pollution of air, ground, or water in, on, or about the Premises through an unauthorized discharge, and to protect and preserve natural resources and wildlife habitat. In the event of such discharge or damage to natural resources in, on, or about the Premises that is the result of an act or omission of the Grantee, its officers, employees, agents, representatives, contractors, and/or invitees, the Grantee shall immediately notify appropriate agencies of the State of Texas and the Grantor and undertake all required and appropriate action to remedy the same. The Grantee shall be liable for all damages to the Premises, public lands, and waters as a result of such act or omission and for mitigation of any such damages.
(b) Natural Historical Preservation Act and Antiquities Code of Texas: **THE GRANTEE IS EXPRESSLY PLACED ON NOTICE OF THE NATIONAL HISTORICAL PRESERVATION ACT OF 1966 AND THE ANTIQUITIES CODE OF TEXAS. IN**

THE EVENT THAT ANY SITE, OBJECT, LOCATION, ARTIFACT, OR OTHER FEATURE OF ARCHEOLOGICAL, SCIENTIFIC, EDUCATIONAL, CULTURAL, OR HISTORIC INTEREST IS ENCOUNTERED DURING THE ACTIVITIES AUTHORIZED BY THIS AGREEMENT, THE GRANTEE SHALL IMMEDIATELY CEASE SUCH ACTIVITIES AND SHALL IMMEDIATELY NOTIFY THE GRANTOR AND THE TEXAS HISTORICAL COMMISSION, SO THAT ADEQUATE MEASURES MAY BE UNDERTAKEN TO PROTECT OR RECOVER SUCH DISCOVERIES OR FINDINGS, AS APPROPRIATE.

6.04 COMPLIANCE WITH OTHER LAWS; NUISANCE: THE GRANTEE, AT ITS OWN EXPENSE, WILL COMPLY WITH ALL FEDERAL, STATE, MUNICIPAL, AND OTHER LAWS, CODES, ORDINANCES, RULES, AND REGULATIONS APPLICABLE TO THE PREMISES; AND WILL INSTALL, REMOVE, AND ALTER SUCH EQUIPMENT AND FACILITIES IN, AND MAKE SUCH ALTERATIONS TO, THE PREMISES AS MAY BE NECESSARY TO COMPLY. THE GRANTEE WILL NOT MAKE ANY UNLAWFUL USE OF THE PREMISES OR PERMIT ANY UNLAWFUL USE THEREOF; AND WILL NOT COMMIT, OR PERMIT ANYONE ELSE TO COMMIT, ANY ACT THAT IS A NUISANCE OR ANNOYANCE TO THE GRANTOR OR ADJACENT PROPERTY OWNERS OR TENANTS, OR WHICH MIGHT, IN THE EXCLUSIVE JUDGMENT OF THE GRANTOR, DAMAGE THE GRANTOR'S GOODWILL OR REPUTATION, OR TEND TO INJURE OR DEPRECIATE THE VALUE OF THE PREMISES AND/OR ANY IMPROVEMENTS LOCATED THEREON. THE OBLIGATIONS OF THE GRANTEE UNDER THIS SECTION SHALL SURVIVE ANY TERMINATION OF THIS AGREEMENT.

6.05 NOTICE

(a) The Grantee shall provide written notice to the Grantor of any change in the Grantee's name, address, corporate structure, legal status or any other information relevant to this Agreement. The Grantee shall provide to the Grantor any other information reasonably requested by the Grantor in writing within 30 days following such request.

(b) Any payments and required written notices under this Agreement shall be delivered by hand, facsimile, or United States Registered or Certified Mail, adequate postage prepaid, to the address(es) listed under the "Address(es) for Notification" section of **Attachment A.** A party may change its address by giving notice as provided above. No change of address shall be binding until notice of such change of address is given as required.

6.06 SEVERABILITY: IF ANY PROVISION CONTAINED IN THIS AGREEMENT IS HELD TO BE UNENFORCEABLE BY A COURT OF LAW OR EQUITY, THIS AGREEMENT SHALL BE CONSTRUED AS IF SUCH PROVISION DID NOT EXIST AND THE NON-ENFORCEABILITY OF SUCH PROVISION SHALL NOT BE HELD TO RENDER ANY OTHER PROVISION OR PROVISIONS OF THIS AGREEMENT UNENFORCEABLE.

6.07 ENTIRE AGREEMENT: THIS AGREEMENT AND ITS ATTACHMENTS CONSTITUTE THE ENTIRE AGREEMENT OF THE PARTIES AND SUCH ARE INTENDED AS A COMPLETE AND EXCLUSIVE STATEMENT OF THE PROMISES, REPRESENTATIONS, NEGOTIATIONS, DISCUSSIONS, AND OTHER AGREEMENTS THAT MAY HAVE BEEN MADE IN CONNECTION WITH THE SUBJECT MATTER HEREOF. UNLESS AN ATTACHMENT TO THIS AGREEMENT SPECIFICALLY DISPLAYS A MUTUAL INTENT TO AMEND A PARTICULAR PART OF THIS AGREEMENT, GENERAL CONFLICTS IN LANGUAGE BETWEEN ANY SUCH ATTACHMENT AND THIS AGREEMENT SHALL BE CONSTRUED CONSISTENTLY WITH THE TERMS OF THIS AGREEMENT. UNLESS OTHERWISE EXPRESSLY AUTHORIZED BY THE TERMS OF THIS AGREEMENT, NO MODIFICATION, RENEWAL, EXTENSION, OR AMENDMENT TO THIS AGREEMENT SHALL BE BINDING UPON THE PARTIES UNLESS THE SAME IS IN WRITING AND SIGNED BY THE RESPECTIVE PARTIES HERETO.

6.08 TAXES: THE GRANTEE SHALL, AS FURTHER CONSIDERATION FOR THIS AGREEMENT, PAY AND DISCHARGE ALL "TAXES" (AS HEREINAFTER DEFINED) PROPERLY ASSESSED IN ANY CALENDAR YEAR (OR PORTION THEREOF) DURING THE TERM OF THIS AGREEMENT. FOR THE PURPOSES OF THIS AGREEMENT, THE TERM "TAXES" MEANS ALL TAXES, ASSESSMENTS, IMPOSITIONS, LEVIES, CHARGES, EXCISES, FEES, LICENSES, AND OTHER SUMS (WHETHER NOW EXISTING OR HEREAFTER ARISING, WHETHER FORESEEN OR UNFORESEEN, AND WHETHER UNDER THE PRESENT SYSTEM OF TAXATION OR SOME OTHER SYSTEM), THAT DURING THE TERM OF THIS AGREEMENT MAY BE LEVIED, ASSESSED, CHARGED, OR IMPOSED BY ANY GOVERNMENTAL AUTHORITY OR OTHER TAXING AUTHORITY OR ACCRUE ON THE PREMISES AND ANY IMPROVEMENTS OR OTHER PROPERTY THEREON, WHETHER BELONGING TO THE GRANTOR OR THE GRANTEE, OR TO WHICH EITHER OF THEM MAY BECOME LIABLE IN RELATION THERETO. THE TERM "TAXES" SHALL ALSO INCLUDE ALL PENALTIES, INTEREST, AND OTHER CHARGES PAYABLE BY REASON OF ANY DELAY OR FAILURE OR REFUSAL OF THE GRANTEE TO MAKE TIMELY PAYMENTS AS REQUIRED PURSUANT TO THIS PROVISION. **THE GRANTEE AGREES TO AND SHALL INDEMNIFY AND HOLD THE GRANTOR HARMLESS FROM LIABILITY FOR ANY AND ALL**

TAXES, TOGETHER WITH ANY INTEREST, PENALTIES, OR OTHER SUMS IMPOSED, AND FROM ANY SALE OR OTHER PROCEEDING TO ENFORCE PAYMENT THEREOF.

6.09 ENCUMBRANCE OF INTEREST: THE GRANTEE MAY NOT MORTGAGE, HYPOTHECATE, ENCUMBER, OR GRANT ANY DEED OF TRUST OR SECURITY INTEREST THAT ENCUMBERS THE PREMISES. FURTHER, THE GRANTEE MAY NOT COLLATERALLY ASSIGN ANY RENT OR OTHER INCOME GENERATED FROM THE PREMISES. PRIOR TO EXPIRATION OR TERMINATION OF THIS AGREEMENT, THE GRANTEE WILL PROVIDE THE GRANTOR WITH DOCUMENTATION SUFFICIENT TO EVIDENCE THE GRANTOR'S OWNERSHIP OF THE IMPROVEMENTS NOT REQUIRED TO BE REMOVED PER ARTICLE II.

6.10 PROPER AUTHORITY: EACH PARTY HERETO REPRESENTS AND WARRANTS THAT THE PERSON EXECUTING THIS AGREEMENT ON ITS BEHALF HAS FULL POWER AND AUTHORITY TO ENTER INTO THIS AGREEMENT.

6.11 RELATIONSHIP OF THE PARTIES: NOTHING CONTAINED IN THIS CONTRACT SHALL BE DEEMED OR CONSTRUED TO CREATE A PARTNERSHIP OR JOINT VENTURE, TO CREATE RELATIONSHIPS OF AN EMPLOYER-EMPLOYEE OR PRINCIPAL-AGENT, OR TO OTHERWISE CREATE FOR THE GRANTOR ANY LIABILITY WHATSOEVER WITH RESPECT TO THE INDEBTEDNESS, LIABILITIES, AND OBLIGATIONS OF THE GRANTEE OR ANY OTHER PARTY.

6.12 GRANTEE'S WAIVER OF CERTAIN RIGHTS AND ASSERTIONS: THE GRANTEE WAIVES AND RELINQUISHES ALL RIGHTS THAT THE GRANTEE MIGHT HAVE TO CLAIM ANY NATURE OF LIEN AGAINST THE GRANTOR AND THE PREMISES, OR WITHHOLD OR DEDUCT FROM OR OFFSET AGAINST ANY CONSIDERATION OR OTHER SUMS PROVIDED HEREUNDER TO BE PAID TO THE GRANTOR BY THE GRANTEE. THE GRANTEE WAIVES AND RELINQUISHES ANY RIGHT, EITHER AS A CLAIM OR AS A DEFENSE, THAT THE GRANTOR IS BOUND TO PERFORM OR IS LIABLE FOR THE NONPERFORMANCE OF ANY IMPLIED COVENANT OR IMPLIED DUTY OF THE GRANTOR NOT EXPRESSLY SET FORTH IN THIS AGREEMENT.

IN TESTIMONY WHEREOF, witness my hand and the Seal of Office.

GRANTOR: THE STATE OF TEXAS

Signature: DocuSigned by: D. Buckingham 840877346904453 Date: 12/5/2024

DAWN BUCKINGHAM, M.D.
Commissioner, General Land Office
Chairwoman, School Land Board

APPROVED:

Contents: DS AN

Legal: DS AH

Deputy Director: DS TL

Executive: DS Initial AP JGJ

COASTAL LEASE: CL20220002

GRANTEE:
U.S. Fish and Wildlife Services, Aransas National Wildlife Refuge

By: _____
(Signature)

Jose H. Saenz Jr.
(Printed Name)

Refuge Manager
(Title)

Date: 12/4/24

ACKNOWLEDGMENT

STATE OF Texas §
§
COUNTY OF Aransas §

This instrument was acknowledged before me on the 4th day of December 20 24,
by Jose Saenz for the U.S. Fish and Wildlife Services, Aransas National Wildlife Refuge.

JOSEPHINE M FARIAS
Notary ID #125312044
My Commission Expires
May 25, 2025

Josephine M. Farias
(Notary Signature)

Notary Public, State of Texas

My commission expires: May 25, 2025

ATTACHMENT A: CONTROL PAGE
COASTAL LEASE CL20220002

GRANTEE'S NAME
U.S. Fish and Wildlife Services, Aransas National Wildlife Refuge

PREMISES
A portion of State Tract Number 45, 46, 47, 47, 57, 56, San Antonio Bay, Aransas County, Texas and Calhoun County, Texas (the "Premises"). The Premises are further described and depicted on **Attachment B** attached hereto and incorporated herein by reference.

USE(S) OF PREMISES
Authorized Use(s) of the Premises: a shoreline stabilization project consisting of a 30' x 26,400' rock rubble breakwater encumbering 1,320,000 square feet (30.30 acres) and a shoreline protection area encumbering 282,000 square feet (6.48 acres) for a total project encumbrance of 1,602,000 square feet (36.78 acres).

ADJACENT PROPERTY
State Tracts 45, 46, and 47, San Antonio Bay, Aransas County and State Tracts 56 and 57, San Antonio Bay, Calhoun County

SPECIAL CONDITIONS
1. Grantee is specifically prohibited from using or permitting the use of the Premises for any commercial or illegal purpose. Provided the Grantor does not unreasonably interfere with Grantee's use of the Premises, the Grantor may use or permit the use of the Premises for any purpose consistent with Grantee's use of the Premises.
2. Grantee must notify the General Land Office, in writing, at least thirty (30) days prior to modification, rebuilding, major repair, or removal of any structure authorized in this instrument.
3. Grantee shall notify the General Land Office in writing within two (2) weeks following completion of any approved modification, rebuilding, major repair, or removal of structures, and the removal of all debris at the site unless such action is related to Termination of the Agreement. Notice of removal due to termination shall be provided as specified in Section 8.02 of the Agreement.
4. Grantee shall maintain markers (aids to navigation) according to U.S. Coast Guard regulations.
5. Riprap breakwaters shall be constructed of suitable limestone rock or broken concrete material that is free of metal rebar.
6. Breakwaters shall be built of sufficient height above the substrate to be visible above the water surface at mean high tide. Permanent markers/pilings shall be installed to U.S. Coast Guard specifications.
7. Breakwaters shall be designed to allow for the ingress and egress of fish and for water circulation as shown in Attachment B.
8. If the structure is damaged or destroyed in excess of fifty percent (50%) of the existing square footage, during the term of this instrument, no rebuilding or repair may take place without prior written approval from the General Land Office.
9. Impacts to seagrasses, emergent marsh, and/or oyster reefs are to be strictly avoided.

COST OF DAMAGE
One Thousand and No/100 Dollars ($1,000) per event.

EFFECTIVE AND TERMINATION DATES
This Agreement is for a total period of twenty (20) years, effective on December 1, 2024, and terminating on November 30, 2044.

PAYMENT(S) AND/OR FEE(S)

In consideration of the mutual covenants and conditions set forth herein and the public benefits to be derived therefrom, Grantor and Grantee acknowledge that no rental fees shall be assessed for the described use of the Premises while Grantee is not in default of the terms agreed upon herein.

ADDRESS(ES) FOR NOTIFICATION

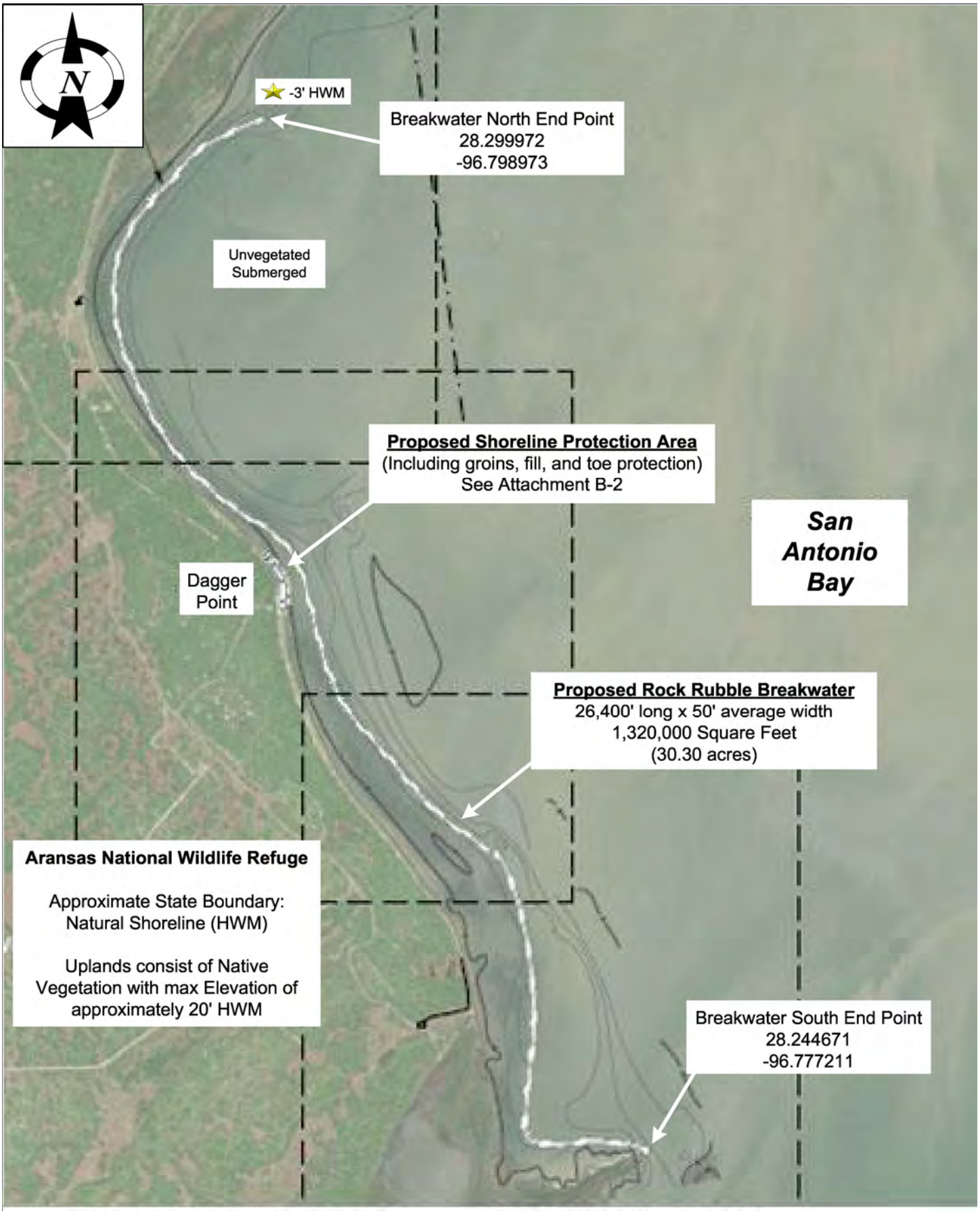
Grantor's Contact Information

Name: Texas General Land Office
Title: Director, Coastal Field Operations
Address: 1700 N. Congress Avenue
Address: Austin, Texas 78701-1495

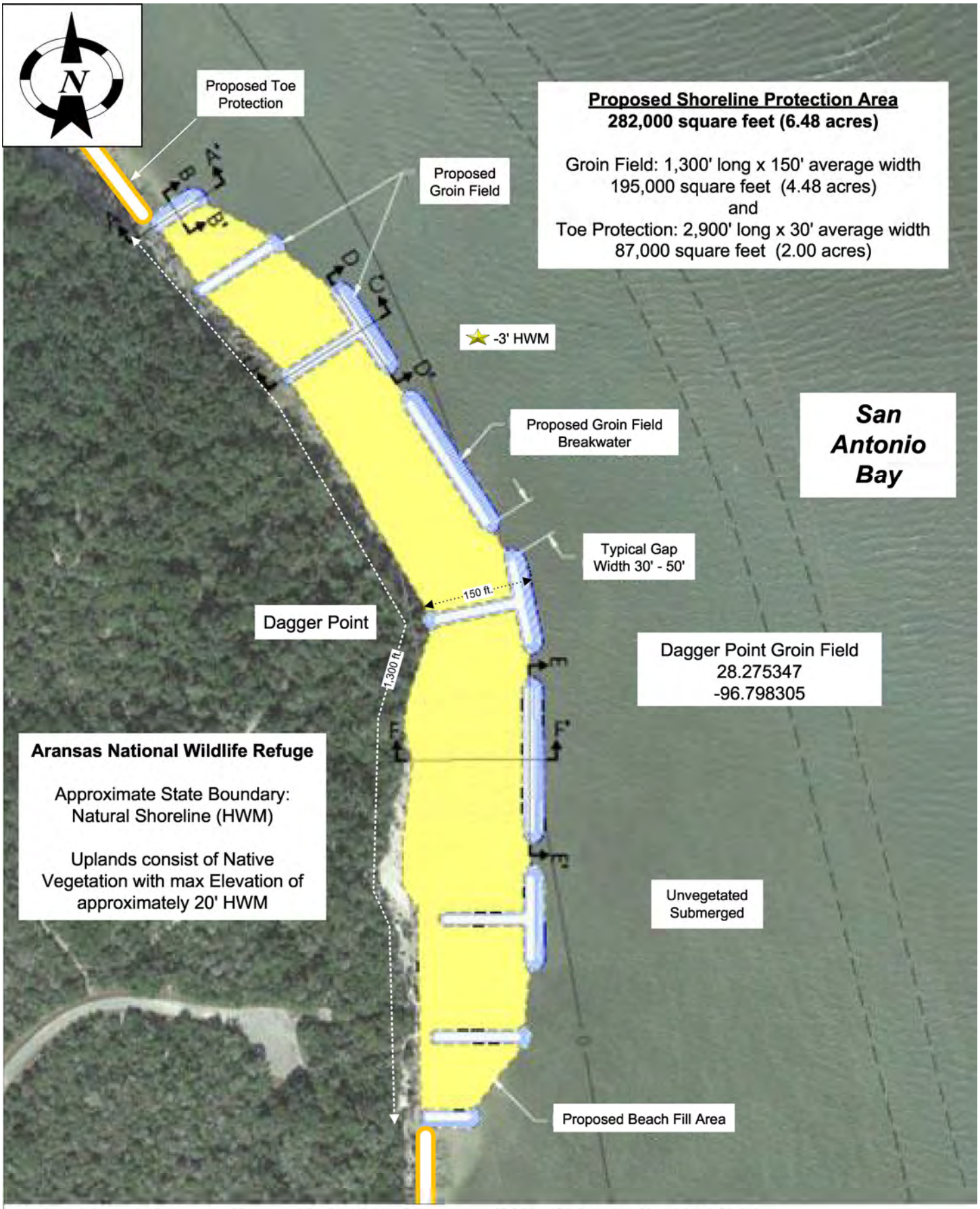
Grantee's Contact Information

Name: U.S. Fish and Wildlife Services, Aransas National Wildlife Refuge
Address: 1 Wildlife Circle
Address: Austwell, TX 77950

ATTACHMENT B:



TITLE: U.S. Fish & Wildlife Service / CL20220002	DATE OF REVIEW: 07/12/2024
COMPANY: Texas General Land Office	CREATOR: JZeplin
DRAWING SCALE: Not to scale	**ATTACHMENT B-1**



TITLE: U.S. Fish & Wildlife Service / CL20220002	DATE OF REVIEW: 07/12/2024
COMPANY: Texas General Land Office	CREATOR: JZeplin
DRAWING SCALE: Not to scale	

ATTACHMENT B-2

NOTES TO USERS

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sources of small size. The **community map repository** should be
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and/or **floodways** have been determined, users are encouraged to consult
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whole-foot elevations. These BFEs are intended for flood insurance
urposes only and should not be used as the sole source of flood
n information. Accordingly, flood elevation data presented in the FIS
should be utilized in conjunction with the FIRM for purposes of
tion and/or floodplain management.

Base Flood Elevations shown on this map apply only landward of
h American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should
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and other pertinent floodway data are provided in the Flood Insurance
port for this jurisdiction.

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on.

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Zone (FIPS Zone 4204). The **horizontal datum** was NAD 83, GRS80
. Differences in datum, spheroid, projection or State Plane zones used in
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es in map features across jurisdiction boundaries. These differences do
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These flood elevations must be compared to structure and ground
s referenced to the same **vertical datum**. For information regarding
on between the National Geodetic Vertical Datum of 1929 and the
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ormation Services
/NGS12
Geodetic Survey
, #9202
st-West Highway
ring, Maryland 20910-3282
3-3242

n current elevation, description, and/or location information for **bench**
shown on this map, please contact the Information Services Branch
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w.ngs.noaa.gov.

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ity is located.

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e (FMIX) at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA
at http://www.fema.gov/business/nfip.

STAL BARRIER RESOURCES SYSTEM (CBRS) LEGEND

83 CBRS Area
SURANCE NOT AVAILABLE FOR STRUCTURES NEWLY BUILT OR
TIALLY IMPROVED ON OR AFTER OCTOBER 1, 1983 IN DESIGNATED
EAS.

90 CBRS Area
SURANCE NOT AVAILABLE FOR STRUCTURES NEWLY BUILT OR
TIALLY IMPROVED ON OR AFTER NOVEMBER 16, 1990 IN DESIGNATED
EAS.

83 Otherwise Protected Area (OPA)
SURANCE NOT AVAILABLE FOR STRUCTURES NEWLY BUILT OR
TIALLY IMPROVED ON OR AFTER OCTOBER 1, 1983 IN DESIGNATED
THIN THE CBRS.

91 Otherwise Protected Area (OPA)
SURANCE NOT AVAILABLE FOR STRUCTURES NEWLY BUILT OR
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THIN THE CBRS.

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CBRS maps are enacted by Congress via the Coastal Barrier
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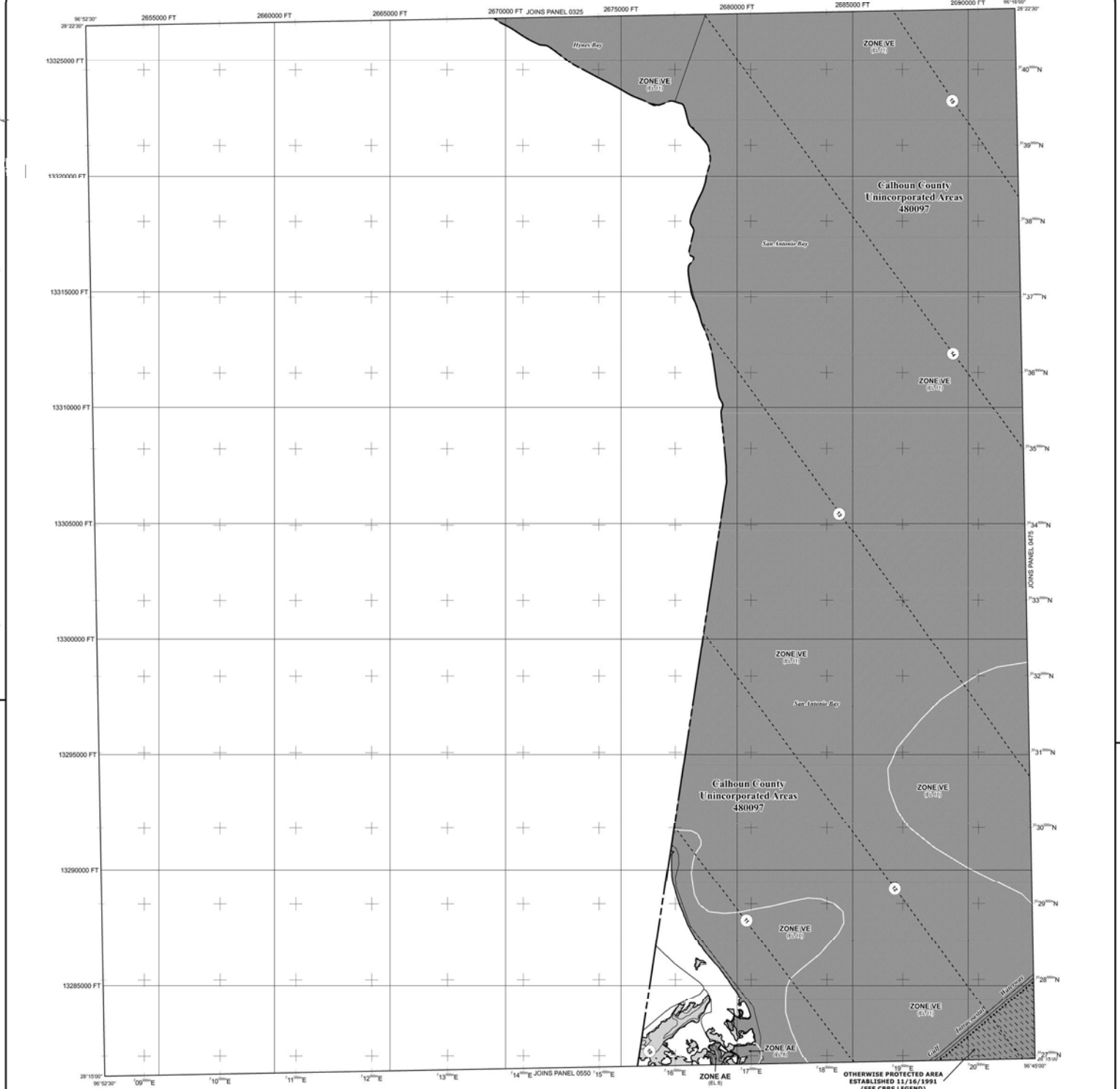
(FWS). The official CBRS maps used to determine whether or not an
cated within the CBRS are available for download at
w.fws.gov. For an official determination of whether or not an area is
within the CBRS, or for any questions regarding the CBRS, please
the FWS field office for this area at (361) 994-9005.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUN
BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that
chance of being equaled or exceeded in any given year. The Special Flood Hazard A
area subject to flooding by the 1% annual chance flood. Areas of Special Flood Haza
Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the wat
elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.
ZONE AE Base Flood Elevations determined.
ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); B
Elevations determined.
ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain
depths determined. For areas of alluvial fan flooding, velo
determined.
ZONE AR Special Flood Hazard Area formerly protected from the 1% ann
flood by a flood control system that was subsequently decertif
AR indicates that the former flood control system is being r
provide protection from the 1% annual chance or greater flood.
ZONE A99 Area to be protected from 1% annual chance flood by a Fe
protection system under construction; no Base Flood
determined.
ZONE V Coastal flood zone with velocity hazard (wave action); no B
Elevations determined.
ZONE VE Coastal flood zone with velocity hazard (wave action); B
Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that mu
free of encroachment so that the 1% annual chance flood can be carried without s
increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance
average depths of less than 1 foot or with drainage areas less tha
mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain
ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREA

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Ar

Floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area Z
boundary dividing Special Flood Hazard Areas of diffe
Flood Elevations, flood depths or flood velocities.
Limit of Moderate Wave Action
513 Base Flood Elevation line and value; elevation in feet*
(EL 987) Base Flood Elevation value where uniform within zone
in feet*
* Referenced to the North American Vertical Datum of 1988
Cross section line
Transect line
Culvert, Flume, Penstock or Aqueduct
Road or Railroad Bridge
Footbridge
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DX5510 Bench mark (see explanation in Notes to Users sectio
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M1.5 River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
October 16, 2014

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Comm
Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your In
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MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
600 0 600 1200 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0450E

FIRM
FLOOD INSURANCE RATE

CALHOUN COUNTY, TEXAS
AND INCORPORATED AREAS

PANEL 450 OF 625

(SEE MAP INDEX FOR FIRM PANEL LAY

CONTAINS:

COMMUNITY	NUMBER	PANEL
CALHOUN COUNTY	480097	0450

- NOTE -

THIS MAP INCLUDES BOUNDARIES OF THE COASTA
RESOURCES SYSTEM ESTABLISHED UNDER THE
BARRIER RESOURCES ACT OF 1982 AND/OR SU
ENABLING LEGISLATION.

Notice to User: The **Map Number** shown below
used when placing map orders; the **Communit**
shown above should be used on insurance applicatio
subject community.

MAP NU
48057

EFFECTIVE
OCTOBER 1

Federal Emergency Management Ag

NOTES TO USERS

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STAL BARRIER RESOURCES SYSTEM (CBRS) LEGEND

83 CBRS Area

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EAS.

90 CBRS Area

SURANCE NOT AVAILABLE FOR STRUCTURES NEWLY BUILT OR
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83 Otherwise Protected Area (OPA)

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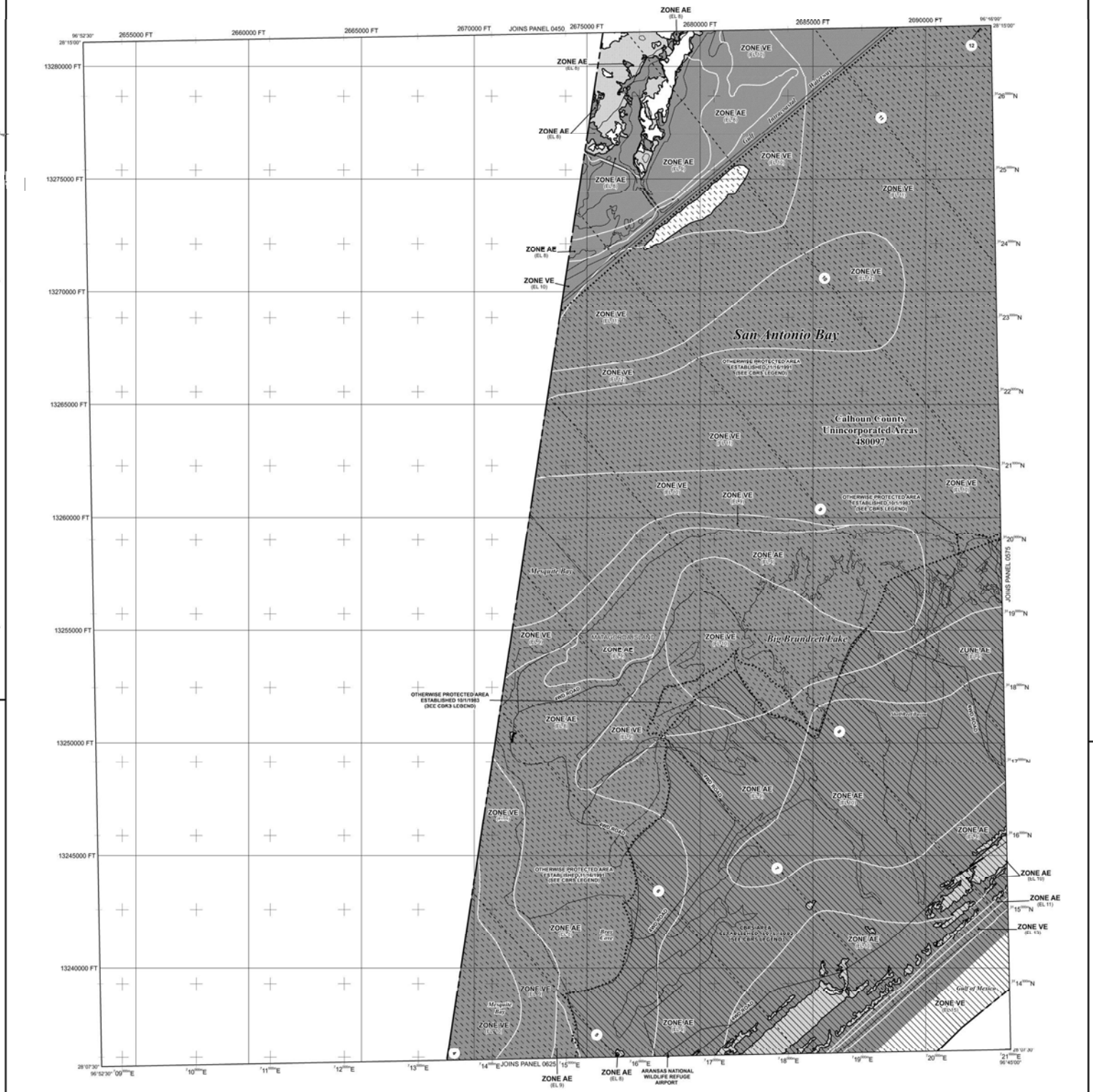

LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUN
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The 1% annual flood (100-year flood), also known as the base flood, is the flood that
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Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the wat
elevation of the 1% annual chance flood.

- **ZONE A** — No Base Flood Elevations determined.
- **ZONE AE** — Base Flood Elevations determined.
- **ZONE AH** — Flood depths of 1 to 3 feet (usually areas of ponding); B
Elevations determined.
- **ZONE AO** — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain
depths determined. For areas of alluvial fan flooding, velo
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- **ZONE AR** — Special Flood Hazard Area formerly protected from the 1% ann
flood by a flood control system that was subsequently decertif
AR indicates that the former flood control system is being r
provide protection from the 1% annual chance or greater flood.
- **ZONE A99** — Area to be protected from 1% annual chance flood by a Fe
protection system under construction; no Base Flood
determined.
- **ZONE V** — Coastal flood zone with velocity hazard (wave action); no
Elevations determined.
- **ZONE VE** — Coastal flood zone with velocity hazard (wave action); B
Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that mu
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increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** — Areas of 0.2% annual chance flood; areas of 1% annual chance
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OTHER AREAS

- **ZONE X** — Areas determined to be outside the 0.2% annual chance floodplain
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COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREA

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Ar

- Floodplain boundary
- Floodway boundary
- Zone D boundary
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- Boundary dividing Special Flood Hazard Area Z
boundary dividing Special Flood Hazard Areas of diffe
Flood Elevations, flood depths or flood velocities.
- Limit of Moderate Wave Action
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone
in feet*

* Referenced to the North American Vertical Datum of 1988

- Cross section line
- Transect line
- Culvert, Flume, Penstock or Aqueduct
- Road or Railroad Bridge
- Footbridge
- 87°07'45", 32°22'30" — Geographic coordinates referenced to the North A
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EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
October 16, 2014

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

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1000 0 2000 4000 FEET
600 0 600 1200 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0550E

FIRM

FLOOD INSURANCE RATE

CALHOUN COUNTY, TEXAS
AND INCORPORATED AREAS

PANEL 550 OF 625

(SEE MAP INDEX FOR FIRM PANEL LAY

CONTAINS:

COMMUNITY	NUMBER	PANEL
CALHOUN COUNTY	480097	0550

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MAP NU
48057

EFFECTIVE
OCTOBER 1

Federal Emergency Management Ag

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p is for use in administering the National Flood Insurance Program. It
t necessarily identify all areas subject to flooding, particularly from local
sources of small size. The **community map repository** should be
d for possible updated or additional flood hazard information.

n more detailed information in areas where **Base Flood Elevations**
nd/or **floodways** have been determined, users are encouraged to consult
d Profiles and Floodway Data and/or Summary of Stillwater Elevations
ontained within the Flood Insurance Study (FIS) report that accompanies
M. Users should be aware that BFEs shown on the FIRM represent
whole-foot elevations. These BFEs are intended for flood insurance
urposes only and should not be used as the sole source of flood
n information. Accordingly, flood elevation data presented in the FIS
hould be utilized in conjunction with the FIRM for purposes of
tion and/or floodplain management.

l Base Flood Elevations shown on this map apply only landward of
h American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should
o that coastal flood elevations are also provided in the Summary of
r Elevations tables in the Flood Insurance Study report for this jurisdiction.
ns shown in the Summary of Stillwater Elevations tables should be used for
tion and/or floodplain management purposes when they are higher than
tions shown on this FIRM.

ies of the **floodways** were computed at cross sections and interpolated
cross sections. The floodways were based on hydraulic considerations
ed to requirements of the National Flood Insurance Program. Floodway
nd other pertinent floodway data are provided in the Flood Insurance
port for this jurisdiction.

areas not in Special Flood Hazard Areas may be protected by **flood**
structures. Refer to Section 2.4 "Flood Protection Measures" of the
surance Study report for information on flood control structures for this
on.

jection used in the preparation of this map was Texas State Plane South
Zone (FIPS zone 4204). The **horizontal datum** was NAD 83, GRS 1980
. Differences in datum, spheroid, projection or UTM zones used in the
on of FIRMs for adjacent jurisdictions may result in slight positional
es in map features across jurisdiction boundaries. These differences do
t the accuracy of this FIRM.

evations on this map are referenced to North American Vertical Datum of
hese flood elevations must be compared to structure and ground
s referenced to the same **vertical datum**. For information regarding
ion between the National Geodetic Vertical Datum of 1929 and the
merican Vertical Datum of 1988, visit the National Geodetic Survey
at http://www.ngs.noaa.gov or contact the National Geodetic Survey at
wing address:

ormation Services
eNOS312
Geodetic Survey
, #9202
st-West Highway
ring, Maryland 20910-3282
3-3242

n current elevation, description, and/or location information for **bench**
shown on this map, please contact the Information Services Branch
National Geodetic Survey at **(301) 713-3242**, or visit its website at
w.ngs.noaa.gov.

ap information shown on this FIRM was provided in digital format by the
Natural Resources Information System (TNRIS). This information was
mmetrically compiled at a scale of at least 1:24,000 from aerial
phy dated 2004.

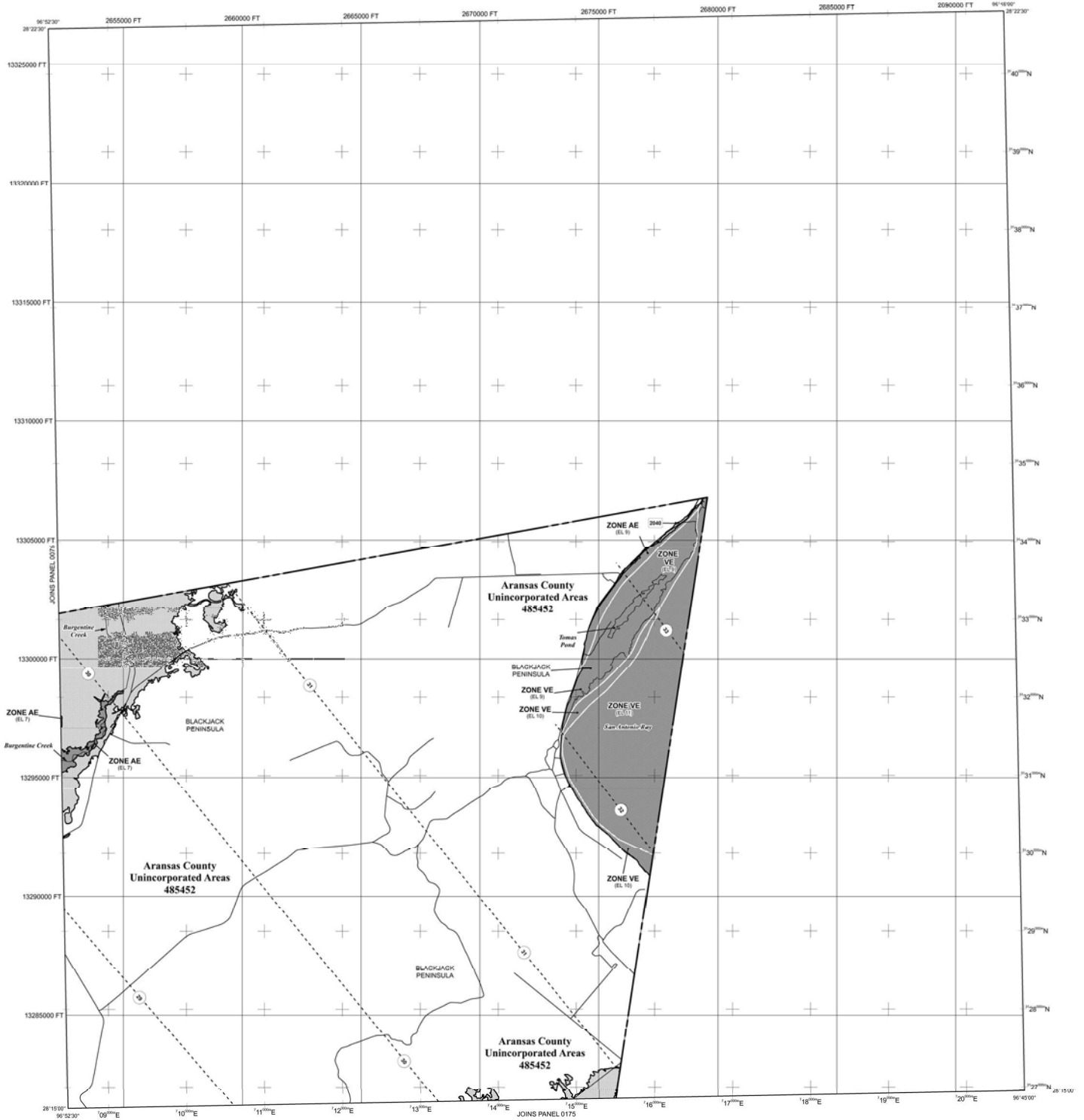
p reflects more detailed and up-to-date **stream channel configurations**
se shown on the previous FIRM for this jurisdiction. The floodplains and
s that were transferred from the previous FIRM may have been adjusted
m to these new stream channel configurations. As a result, the Flood
and Floodway Data tables for multiple streams in the Flood Insurance
eport (which contains authoritative hydraulic data) may reflect stream
distances that differ from what is shown on this map.

te limits shown on this map are based on the best data available at the
ublication. Because changes due to annexations or de-annexations may
urred after this map was published, map users should contact appropriate
ty officials to verify current corporate limit locations.

efer to the separately printed **Map Index** for an overview map of the
showing the layout of map panels; community map repository addresses;
sting of Communities table containing National Flood Insurance Program
r each community as well as a listing of the panels on which each
ty is located.

rmation on available products associated with this FIRM visit the **Map**
Center (MSC) website at http://msc.fema.gov. Available products may
viously issued Letters of Map Change, a Flood Insurance Study Report,
igital versions of this map. Many of these products can be ordered or
directly from the MSC website.

ave **questions about this map**, how to order products or the National
surance Program in general, please call the FEMA Map Information
e (FMIX) at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA
at http://www.fema.gov/national-flood-insurance-program.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUND
BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that
chance of being equaled or exceeded in any given year. The Special Flood Hazard A
area subject to flooding by the 1% annual chance flood. Areas of Special Flood Haz
Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the watersurface
of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); B
Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain
depths determined. For areas of alluvial fan flooding, velo
determined.

ZONE AR Special Flood Hazard Area formerly protected from the 1% annu
flood by a flood control system that was subsequently decertifi
AR indicates that the former flood control system is being re
provide protection from the 1% annual chance or greater flood.

ZONE A99 Area to be protected from 1% annual chance flood by a Fed
protection system under construction; no Base Flood
determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no B
Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); B
Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must b
of encroachment so that the 1% annual chance flood can be carried without substantia
in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance f
average depths of less than 1 foot or with drainage areas less than
mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREA

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Are

Floodplain boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Z
boundary dividing Special Flood Hazard Areas of diffe
Flood Elevations, flood depths or flood velocities.

Limit of Moderate Wave Action

513 Base Flood Elevation line and value; elevation in feet*

(EL 987) Base Flood Elevation value where uniform within zone;
in feet*

* Referenced to the North American Vertical Datum of 1988

Cross section line

Transect line

Culvert, Flume, Penstock or Aqueduct

Road or Railroad Bridge

Footbridge

87°03'45", 32°22'30" Geographic coordinates referenced to the North Am
Datum of 1983 (NAD 83), Western Hemisphere

3776000mN 1000-meter Universal Transverse Mercator grid values,

600000 FT 5000-foot grid values: Texas State Plane coordinate sys
South Central zone (FIPSZONE 4204), Lambert Conform
projection

DX5510 Bench mark (see explanation in Notes to Users sectio
FIRM panel)

M1.5 River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
February 17, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Comm
Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your In
agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'

1000 0 2000 4000 FEET

600 0 600 1200 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0100G

FIRM

FLOOD INSURANCE RATE

ARANSAS COUNTY,
TEXAS
AND INCORPORATED AREAS

PANEL 100 OF 400

(SEE MAP INDEX FOR FIRM PANEL LAY

CONTAINS:

COMMUNITY	NUMBER	PANEL
ARANSAS COUNTY	485452	0100

Notice to User: The **Map Number** shown below
used when placing map orders; the **Communit**
shown above should be used on insurance applicatio
subject community.

MAP NU
48007C

EFFECTIVE
FEBRUARY 1

Federal Emergency Management Ag