Appendix D – Environmental

HGNC Galveston Channel Extension
Galveston, Galveston County, Texas
Draft Validation Report

July 2024

US Army Corps of Engineers
Galveston District

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FINAL
SUPPLEMENTAL
ENVIRONMENTAL ASSESSMENT

GALVESTON HARBOR CHANNEL EXTENSION
FEASIBILITY STUDY
GALVESTON COUNTY, TEXAS

U.S. Army Corps of Engineers
Southwestern Division
Galveston District

July 2024

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1.0 INTRODUCTION

The US Army Corps of Engineers, Galveston District (USACE) prepared this Supplemental Environmental Assessment (SEA) to evaluate and disclose the potential impacts to the natural and human environment from modifying the authorized, but not constructed Galveston Harbor Channel Extension (GHCE) Project (Authorized Plan [AP]). Since the project was authorized and moved into the pre-engineering design (PED) phase, additional features not considered in the 2016 Environmental Assessment (EA) and Feasibility Report (FR) have been identified as required to construct and operate the channel as authorized.

This SEA has been prepared in accordance with the National Environmental Policy Act (NEPA) (42 U.S. Code [USC] 4321 et seq.) and its implementing regulations published by the Council on Environmental Quality (CEQ) (40 Code of Federal Regulations [CFR], 1500 to 1508), and the U.S. Department of Army's NEPA regulation (32 CFR 651) and associated implementation guidance (AR 200-2). This EA supplements the Galveston Harbor Channel Extension Feasibility Study Final Environmental Assessment (USACE 2016) and associated Finding of No Significant Impact (FONSI) (USACE 2018) because the action remains to occur and substantial changes to the proposed action are proposed.

1.1 PROJECT HISTORY

The Galveston Harbor and Channel (GHC), Texas Project was part of an earlier study for improving the deep-draft navigation channels within the Galveston Bay area authorized by a resolution of the House Committee on Public Works in October 1967. This resolution authorized a review of previous reports on the Houston Ship Channel (HSC), Galveston Harbor Channel (GHC), and the Texas City Channel. The review was completed in January 1980 and demonstrated that channel modifications necessary to improve the efficiency and safety of Galveston Bay channels were feasible and recommended that studies continue into the feasibility phase. Each of the channels at the time of review were authorized to -37 feet MLLW.

As a result, the Galveston Bay Area Navigation Study (GBANS) Feasibility Report and Environmental Impact Statement (EIS) looked at the feasibility of improving the Houston and Galveston channels. The GBANS was completed in 1987 and recommended that the GHC be deepened to -51 feet and widened to 450 feet to provide access to deeper water in the Gulf of Mexico. Issues raised during the Washington review of the GBANS resulted in a decision by the Assistant Secretary of the Army for Civil Works (ASA(CW)) that a reevaluation study should be performed.

A limited reevaluation report (LRR), known as the Houston-Galveston Navigation Channels, Texas, Galveston Channel Project, Final Limited Reevaluation Report (1995 LRR) and Supplemental Environmental Impact Statement (SEIS), was completed in November 1995. The 1995 LRR presented a plan that consisted of deepening and widening the HSC and deepening of the GHC in two phases. Phase I consisted of deepening the channels to a depth of 46 feet; Phase II further proposed deepening the channels to 51 feet. Environmental studies were conducted at that time to assess the impacts of a 51-foot channel; however, it was later determined that deepening the channel to 51 feet was not economically justified.

Deepening of the HSC portion to -46 feet was completed in 2005. Deepening of the GHC did not proceed at that time due to lack of NFS funds. Once funds were available, the benefits and costs of the Authorized Plan as identified in the 1995 LRR and authorized by WRDA 1996, were updated by the Houston-Galveston Navigation Channels, Texas, Galveston Channel Project, Final Limited Reevaluation Report, dated May 31, 2007 (2007 LRR). The 2007 LRR updated project design, cost, benefits and environmental impacts specifically related to the Galveston Channel Reach. The 2007 LRR Authorized Plan consisted of deepening portions of the GHC to 46 feet from Station 0+000 to Station 20+000 (2.16 miles) with a bottom width varying from 650 to 1,112 feet and a side slope of 1 foot vertical to 3 foot horizontal. Deeping was completed in January 2011. Approximately 2,571 feet of the channel remained at a depth of -41 feet MLLW.

Deepening the remaining 2,571 feet of the GHC was investigated in the Galveston Harbor Channel Extension (GHCE) Project, Houston-Galveston Navigation Channels, Texas feasibility study. On 08 August 2017, the Chief of Engineers signed the Chief's Report for the GHCE which recommended to Congress that the channel from Station 20+000 to Station 22+571 be deepened to 46 feet. An EA and Finding of No Significance (FONSI) were completed to disclose environmental impacts of the action. Funding for construction of the GHCE was provided by the Infrastructure Investment Jobs Act (IIJA) in 2021, which resumed the PED phase.

1.2 PROJECT AREA

Galveston Bay, the largest inland bay on the Texas coast, is an important commercial and recreational fishing resource and provides access to the deep-water ports of Houston, Texas City, and Galveston. The Houston and Galveston Channels traverse the Galveston Bay area.

Located on the upper Texas coast on the eastern end of Galveston Island, the Port of Galveston is 9.3 miles from the opening of the Gulf of Mexico. The Port of Galveston consists of the Galveston Harbor Channel, the south side of Pelican Island, the north side of Galveston Island and the entrance to Galveston Bay (Table 1 and Figure 1). The GHC serves the Port of Galveston in Galveston, Galveston County, Texas.

Table 1. Approximate Channel Reach Designations for the HGNC Project.

Reach	Reach and Station Numbers	Authorized Depth (MLLW)	Existing Depth (MLLW)	Bottom Width *(feet)*	Channel Length *(feet)*	Channel Length *(miles)*
Offshore	Outer Bar, Entrance and Extended Entrance Channels Offshore (Sta. 21+753 0 to 76+000)	-48	-48	800	54,248	10
	Bolivar Roads and Inner Bar Channels (Sta. 0+000 to 21+753)	-46	-46	800	21,752	4
Galveston Channel	Galveston Harbor Channel - Bolivar Roads to Pier 38 (Sta. 0+000 to 20+000)	-46	-46	1,133 (max)	20,000	6.1
	Channel Extension - Pier 38 to 43rd St (Sta. 20+000 to 22+571)	-46	-41	1,075	2,571	0.5
	Channel Extension (Sta. 22+571 to 23+076	-46	~ -33 to ~ -42	~745 to ~385	505	0.1

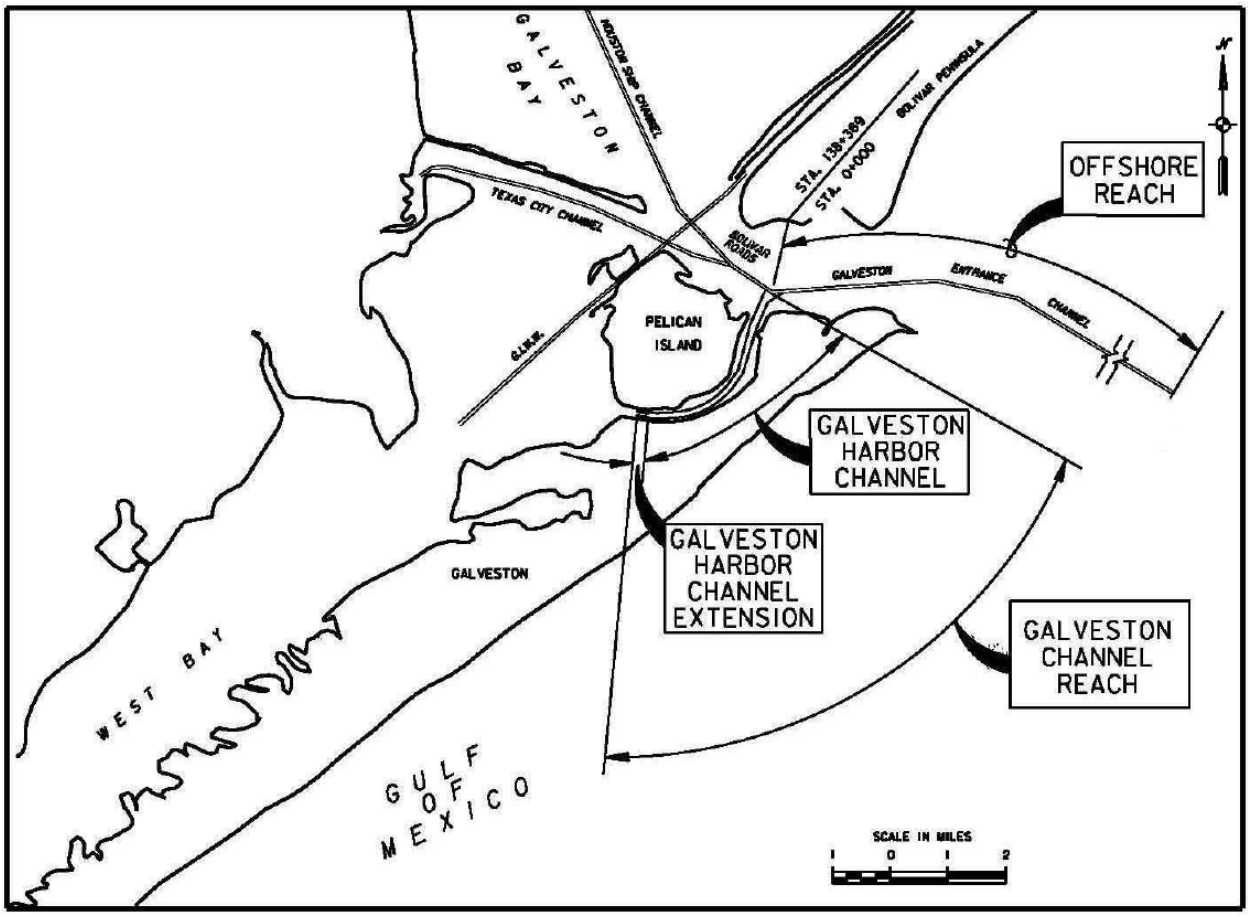

Figure 1. Galveston Harbor Channel (GHC) Project Area

1.3 PURPOSE AND NEED

The purpose of the Federal action to modify the GHCE project is to increase channel efficiency and to allow the pilots to more safely and efficiently maneuver the terminal end of the channel and to enter and exit the federal channel at the far western end of the channel. Currently, if the GHCE is constructed as authorized, light loading of vessels to access and depart these facilities would continue to be needed resulting in inefficient transportation practices and higher costs. A 2019 Ship Simulation study was performed by Locus LLC, the Galveston – Texas City Texas Pilots and G & H Towing (TXIT Suezmax Extension Simulation Report). Their Findings and Recommendations demonstrated that an additional 505 feet of channel length was necessary to allow the pilots to maneuver the terminal end of the channel more safely and efficiently and to enter and exit the federal channel. As a result, an adjustment was identified as being needed between Stations 22+571 to Station 23+076.

1.4 SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT (SEA) SCOPE

The 2016 EA analyzed the authorized project and the no action alternative. The scope of this SEA is to identify and evaluate the environmental effects that could result from implementation

of the proposed modified project. Environmental effects analyzed in the 2016 EA that have not changed are incorporated by reference and will not be discussed further in this SEA. The proposed modification will be further discussed in Chapter 2.0.

2.0 ALTERNATIVES

This chapter describes and compares the No Action Alternative authorized plan and the proposed modified plan.

2.1 NO ACTION

The future without-project condition (FWOP), also known as the "No Action" Alternative, is the most likely condition expected to occur in the future in the absence of the proposed action or action plans. For this SEA, the No Action is the authorized channel improvement project as defined in the 2017 Chief's Report without any design changes, which is referred to as the Authorized Plan. The Authorized Plan consists of deepening the existing channel from -41 feet MLLW to -46 feet MLLW, plus three feet of advanced maintenance and two feet of allowable overdepth, such that the maximum channel depth following periodic maintenance will not exceed -50 feet MLLW. Deepening would begin near Port of Galveston (POG) Pier 38 at Station 20+000, continue westward towards Pelican Island Bridge and end at Station 22+571 (Figure 2) for approximately 2,571 feet. The Authorized Plan does not include any channel widening, so the bottom width will remain at 1,075 feet or less and the channel top-of-cut will remain consistent with the template of the existing project. Figure 3 shows the channel template.

Channel deepening will be accomplished using a cutterhead, hydraulic pipeline dredge. The project will generate approximately 457,400 cubic yards (cy) of new work material, consisting primarily of firm clays with low plasticity. The new work dredged material will be placed in the Pelican Island Placement Area (PA), a 1,100-acre upland site located approximately 1.25 miles north of the channel (Figure 4). Deepening the channel is not anticipated to change the frequency or quantity of material from the 41-foot-deep project. Maintenance dredging will still be required every four years and generate approximately 648,000 cy and could be placed in the Pelican Island PA, the Galveston Ocean Dredged Material Disposal Site (ODMDS), consistent with existing maintenance dredging.

The Authorized Plan also involves mechanically raising the dikes at Pelican Island PA prior to deepening the channel to sufficient height to allow for the containment of the new work material and any initial maintenance material that may be encountered above the new work material during the channel deepening. No modification to the existing weir structures located at the northwest corner of Cell B or the drop-outlet structure located in Cell C would be needed as a result of the dike raising.

The construction period for the new work dredging and placement will take approximately four months, including one month to prepare the placement area and three months to construct the channel extension.

The Authorized Plan did not induce unavoidable, permanent adverse impacts; therefore, no mitigation was identified.

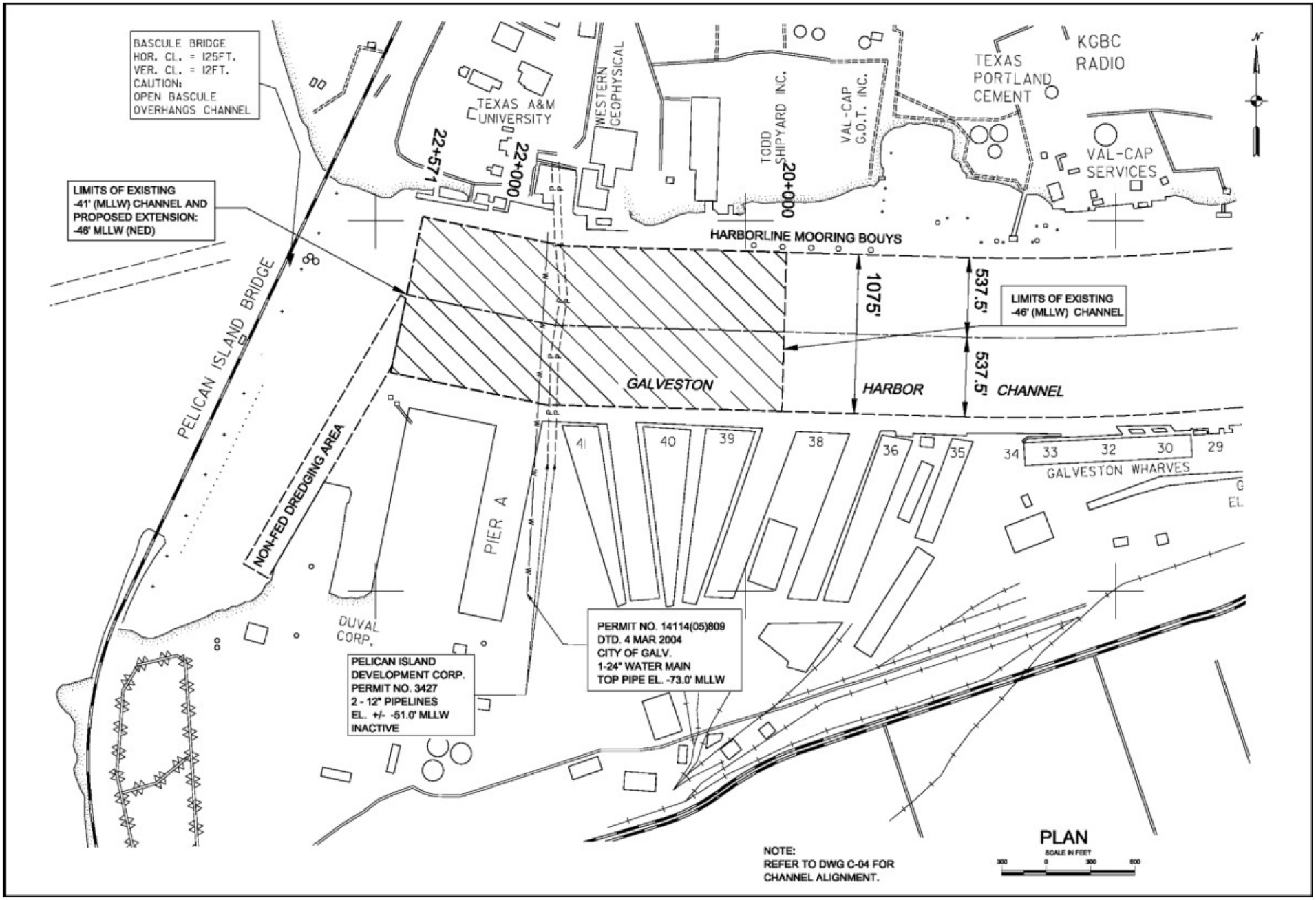

Figure 2. Galveston Harbor Channel Extension Channel Deepening Limits of the Authorized Plan

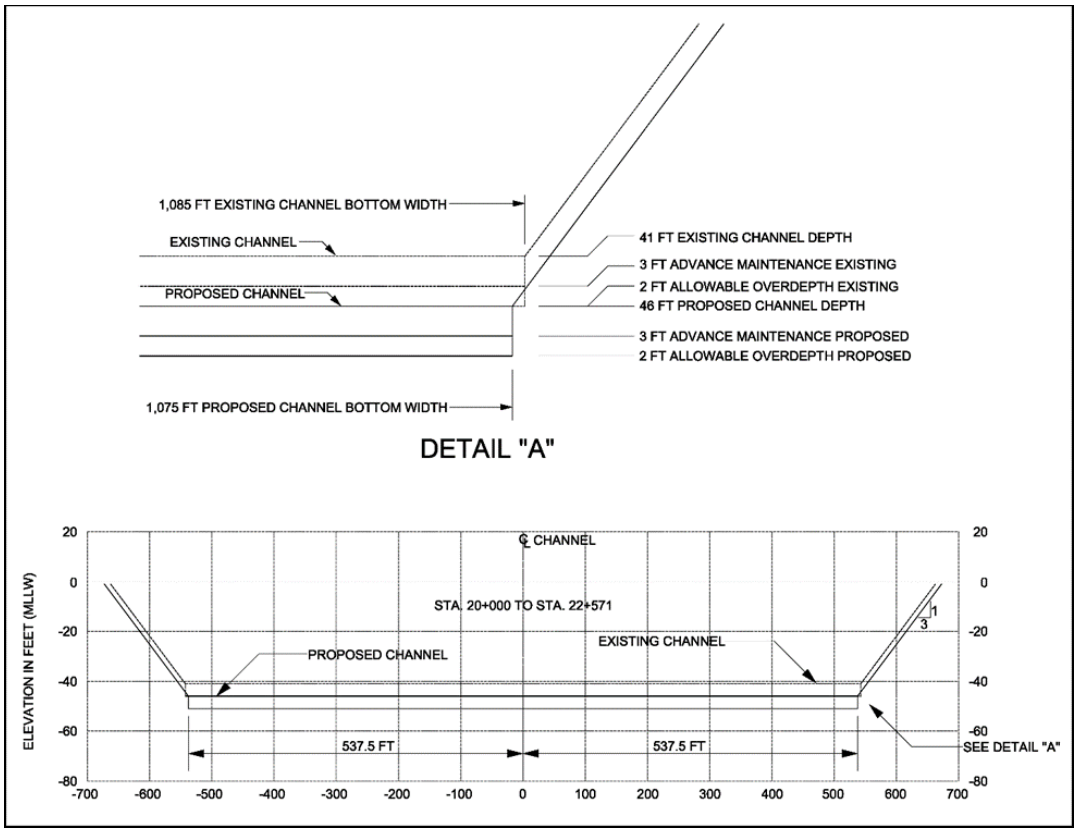

Figure 3. GHCE Authorized channel template

Figure 4. GHCE Authorized Plan

2.2 PROPOSED MODIFIED PLAN

Once the GHCE feasibility study phase concluded, the PED phase began with the design team and the Board of Trustees of the Galveston Wharves (the non-Federal sponsor for the project) working to refine the design of project elements. Proposed modifications were based on a concern raised by the NFS and pilots about the safety of maneuvering vessels safety into and out of the federal channel at the most western end of the channel. Other modifications were the result of more detailed information available or greater certainty of the information, such as the quantity of dredge material anticipated. As a result, the design was revised to resolve the concern and incorporate the new information.

To address the maneuverability and access concerns, additional channel was incorporated into the design between stations 22+571 and 23+076 (Figure 5). The additional channel would involve an additional 505 feet of channel from the existing ground level to a depth of -46 feet, plus four feet of advanced maintenance and one foot of allowable overdepth (Figure 6). The channel bottom width would vary between 385 feet and 738.5 feet. A cutterhead, hydraulic pipeline dredge would be used to remove all material. The additional channel is expected to generate approximately 143,082 cy of new work material. New work and maintenance material would be placed into the Pelican Island PA. Construction of the additional channel is expected to add an estimated 14 days to the total construction duration.

No mitigation is required for the proposed modified plan.

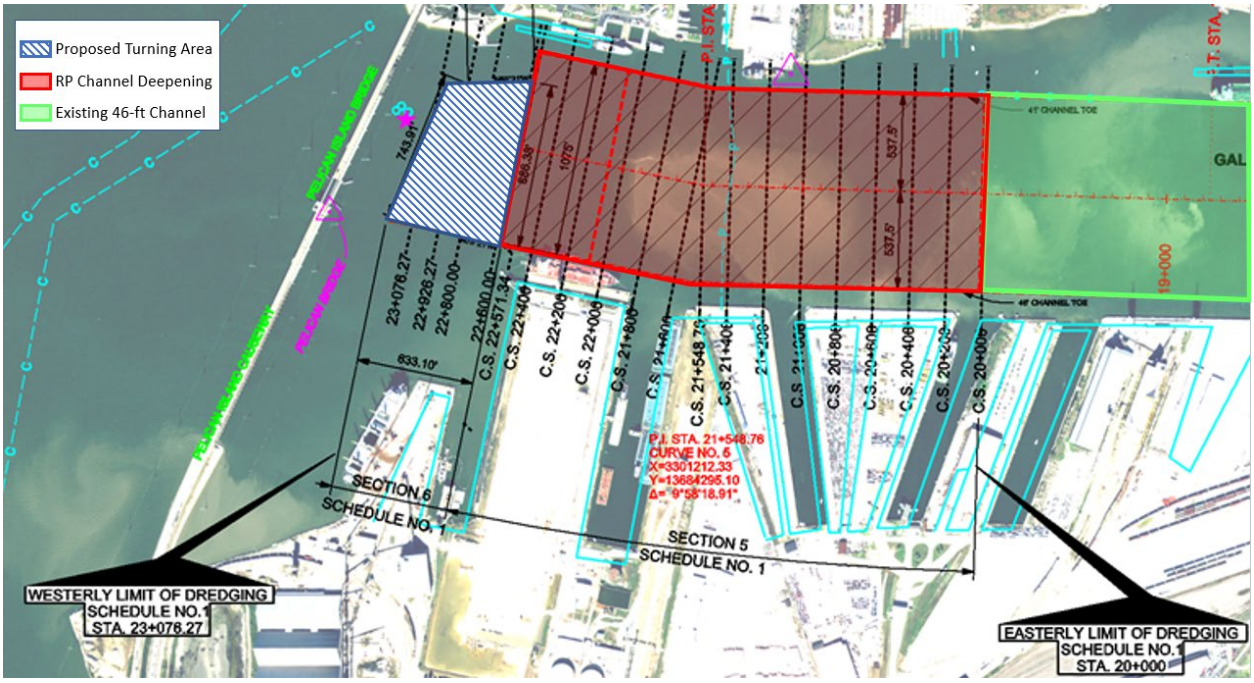

Figure 5. Proposed Additional Channel

Figure 6. Proposed Additional Channel Template

Other design modifications include:

- change in sediment quantities as a result of updated bathymetric surveys;
- change in channel template design that incorporates new policies regarding advanced maintenance and allowable overdepth (Figure 7); and

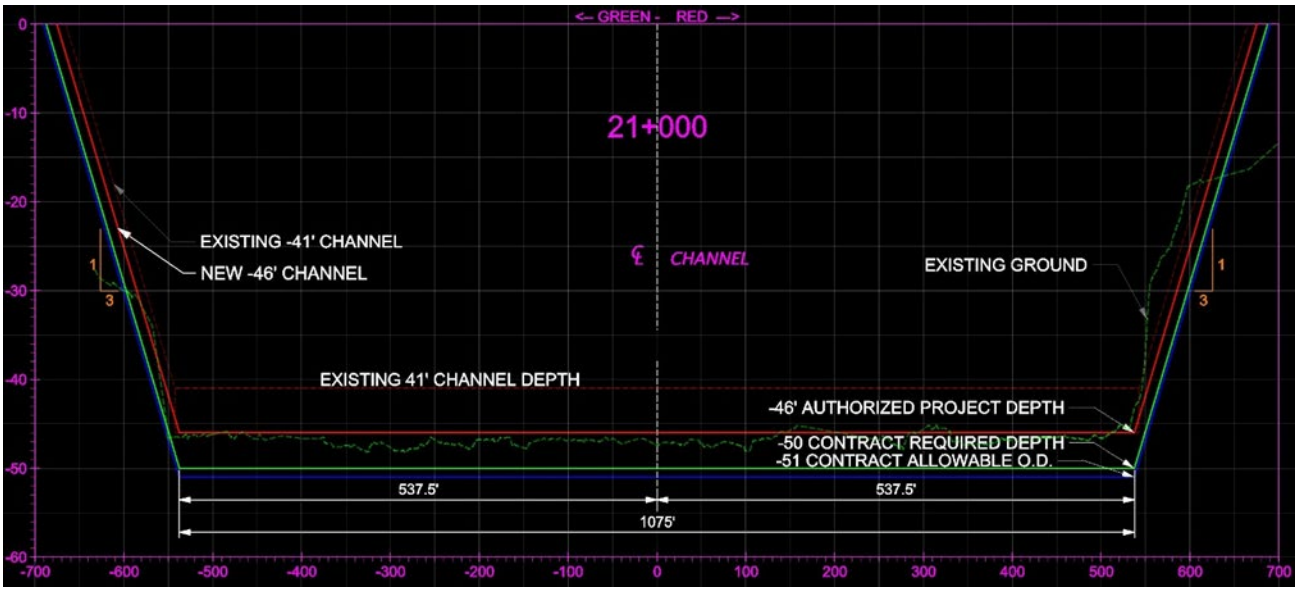

Figure 7. Refined Channel Template for Deepening between Sta. 20+000 and 22+571

Table 2 shows the differences between the No Action alternative and the Proposed Modified plan impacts.

Table 2. Comparison of the Authorized Plan to the Modified Plan

Change	Authorized Plan/No Action	Proposed Modified Plan	± Change in Impact
Channel Extension	Deepen to -46 feet MLLW between Sta 20+000 and 22+571. The channel template extends a 1v:3h slope from elevation -46 with a vertical cut for 3 ft of advanced maintenance and an additional 2 ft for allowable overdepth. The design would generate 457,400 cy of new work dredge material.	No change in stationing; however, the channel template would extend the 1v:3h slope with a vertical cut for 4 ft of advanced maintenance and an additional 1 ft for allowable overdepth. The design would generate 609,500 cy of new work dredged material.	+152,100 cy of new work material
Additional Channel	Not included in Authorized Plan	Ad 505 feet of channel to the authorized project. New work dredging would generate 124,400 cy of material to be placed at the Pelican Island PA.	+124,400 cy of new work material
Pelican Island PA Modifications	Mechanically raise the dike of cell B approximately 2 ft to an elevation of +30 ft with 1v:3h sides slopes and a crest width of approximately 10 ft wide.	Removed from project since dike raising is no longer necessary.	-1 month of construction noise, vibration, emission impacts
Maintenance Dredging (Authorized Project and Modification)	Every 4 years generating 648,000 cy of material	Every 4 years generating 196,000 cy of material	No change
Construction Duration (Extension and Additional Channel)	~4 months, including 1 month to prepare the placement area and 3 months to construct the channel extension of which 62.5 days is dredging time.	~3 months (since Pelican Island PA modifications are not needed), including 2.5 months to construct the channel extension and 0.5 month to construct the Additional Channel, of which 43 days is dredging time.	-1 month of total construction duration (-19.5 days of dredging time)
Footprint (Extension and Additional Channel)	81.8 acres	92.8 acres	+11 acres

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The design modifications to the Authorized Plan were reviewed to determine impacts to the natural and human environment. This section provides a description of the affected environment and the impacts that could result from implementation of the Proposed Modified Plan. Effects can be either beneficial or adverse and are considered over a 50-year period of analysis.

3.1 OVERVIEW

The project area includes the eastern end of Galveston Island and all of Pelican Island. Galveston Island is a low-lying barrier island two miles off the Texas coast, approximately 50 miles southeast of Houston, Texas. Texas City, an important Gulf port city and producer of refined petroleum products, is located approximately seven miles from the project area.

Galveston Island was formed as an offshore bar at the beginning of the present sea level stand and grew by accretion of sand from littoral drift. Pelican Island was a natural sandspit that has been expanded substantially through years of regular and ongoing dredged material disposal from the GHC and Texas City Channels maintenance actions.

Galveston Island, the GHC and the Pelican Island PA are located in highly disturbed areas, associated with previous and ongoing maintenance and construction activities related to the existing authorized project. The GHC is a very active shipping lane providing deep-draft vessel access to the Port of Galveston, an important Texas deep water port. The channel is highly developed with various wharfs, docks and commercial and industrial facilities associated with Port operations and other users, as well as the presence of the Texas A&M University of Galveston (TAMUG) campus and the Pelican Island Bridge.

Because of human disturbance over many decades, habitat types in the project area have been disturbed to the point where original species composition and diversity found prior to major development and industrialization, no longer exist. Only one small 4-acre remnant tidal salt marsh occurs along the northwestern edge of the project area between the Pelican Island Bridge and TAMUG. The marsh occurs behind a berm of shell hash along the shoreline and is connected to bay waters through a small tidal inlet channel.

Although oyster habitat can be found in the adjacent Galveston Bay estuary, no oyster reef habitat is present in the project are. Likewise, seagrasses historically flourished in the Galveston Bay System but have nearly disappeared from the bay system and are not present in the project area. The quality and productivity of the benthic marine habitat within and immediately adjacent to the Galveston Harbor is considered low compared to the overall bay system since the benthic substrate along the channel is highly disturbed due to the frequency of maintenance dredging and the effects of ship traffic.

The Port of Galveston is equipped with facilities to handle various cargo types including containers, dry and liquid bulk, break bulk, RO/RO (roll-on/roll-off of cargo), refrigerated and project cargoes. The principal cargoes are agricultural products such as grains, vegetables, fruit, and commercial cargoes to include sulfur, timber, and various other building materials. The

Port also has a cruise-liner passenger terminal and is the year-round homeport to two Carnival Cruise Line vessels.

The Galveston community has a diversified income base, but jobs are predominantly dependent upon tourism, the Port, commercial fishing, the University of Texas Medical Branch (UTMB), and the American National Insurance Company. Tourism is a major contributor to the project area economy. Development of the area as a recreational area relates to its proximity to the population of the Houston-Galveston metropolitan area, its many miles of beaches, and favorable climate. Fishing and boating are the most important recreational activities in the project area. Other forms of recreation common to the area are water and jet skiing, surfing, bird watching, swimming, and beach combing (among others). Many charter vessels are available along the docks in Galveston for those desiring deep sea or bay fishing, and several private and public marinas, boat launching ramps, bait camps, and yacht and sailing clubs are located in the vicinity of the project area.

Major roadways within the project area include State Highway 87 (SH-87) and Highway 275, which directly service the Port. SH-87 is a major local artery providing mainland access to the Port, the State Marine Highway Ferry system, and to communities such as Bolivar, Anauhac, and Beaumont via the ferry system. Both roadways are used by commercial, tourist, and local traffic, and connect to Interstate Highway-45, a major corridor connecting Galveston Island directly to the City of Houston and to the Interstate system. Vehicular traffic consists of a mixture of local area and urban residents, commercial and industrial vehicles associated with the Port industries, and tourism. Various railway connections also serve the Port of Galveston and the City of Galveston.

3.1.1 No Action Alternative Impacts

The 2016 EA addresses the environmental consequences of the GHCE Authorized Plan. Overall environmental impacts resulting from deepening the -41-foot channel to -46 feet are expected to be negligible because construction would occur within the existing project footprint and an existing PA will be used. The following very briefly summarizes the key points of the analysis:

- Negligible impacts to very low quality bay bottom habitat comparable in type and magnitude to those experienced during routine maintenance that occurs for the existing channel template.
- No special aquatic sites, including wetlands, would be impacted. Therefore, no mitigation would be required for this project
- Only minor, temporary increases in turbidity, noise and navigation traffic are anticipated. However, such effects would not be “new,” but would be among the cyclical recurring impacts that occur during maintenance of the channel.
- Deeper draft vessels accessing bulk cargo facilities at the far west end of the channel would not be constrained by channel depth resulting in more efficient movement of commodities.

- All affected resources are expected to recover to pre-project conditions after construction is complete.

The proposed project is expected to contribute beneficially to navigation efficiency and is not expected to contribute negative cumulative impacts to the area.

3.1.2 Affected Environment

Benthic marine organisms are an ecologically important component of the marine resources, serving as a major source of food for many species of fish and shellfish of commercial and recreational importance. Benthic organisms are also primary consumers, feeding on microalgae and plant detritus, providing an important link in the marine food chain. The most abundant benthic organisms in the project area include annelid worms (polychaetes and oligochaetes), peracarid crustaceans (amphipods and tanaidaceans), and mollusks (bivalves and gastropods).

The quality and productivity of the benthic marine habitat within and immediately adjacent to the Galveston Harbor is considered low compared to the overall bay system since the benthic substrate along the channel is highly disturbed due to the frequency of maintenance dredging of the Federal channel and private berths and docks, as well as the effects of ship traffic (USACE 1987). Small free-swimming and benthic marine organisms in the immediate vicinity of maintenance dredging work are caught by the dredge cutter head or pulled into the pipeline by the pump and removed. Recolonization of the benthic community between maintenance cycles is dependent on salinity and temperature as well as the nature of the channel substrate and other environmental parameters related to sediment distribution (White et al. 1985). Since sediment quality does not differ greatly between maintenance cycles, recolonization of the benthic habitat within the channel is more likely due to overall environmental parameters within the bay.

Although oyster habitat can be found in the adjacent Galveston Bay estuary, no oyster reef habitat is present in the project area as confirmed by an oyster survey completed in April 2022. Seagrass beds are also not present in the project area as the level of human disturbance, turbidity, and depth of water have created conditions unsuitable for establishment and sustainment of seagrass beds.

Table 3. Resources Considered in the 2016 EA

Resource	Changes to the Affected Environment Since the 2016 EA	Potential Impacts to Resource Areas from the Proposed Modified Plan	Considered Further
Sea Level Change/ Local (Relative) Sea Level Change (RSLC)	No change	Modifications would not change water levels and RSLC is not expected to have significant impacts on dredging frequency, shoaling or ship handling. No additional impacts beyond those previously analyzed are anticipated.	No
Tides and Salinity	No change	Modifications would not change water levels and salinity variation that may occur is likely relatively small. No additional impacts beyond those previously analyzed are anticipated.	No
Vegetation	No change	All ground-disturbing modifications are proposed in the water. No additional impacts beyond those previously analyzed are anticipated.	No
Aquatic Nuisance Species	No change	Modifications would not result in an increase in the number of vessels that could introduce invasive aquatic species. No additional impacts beyond those previously analyzed are anticipated.	No
Wetland Resources	No change	The one marsh site remains outside the project footprint resulting in no impacts beyond those previously analyzed.	No
Marine Aquatic Resources	No change	New surveys were conducted to determine if oyster or seagrass habitats were present in new project footprint, there were no signs of habitat. Impacts are further discussed in Section 3.3.1	Yes
Wildlife	No change	Modifications would cause temporary, minor disturbances to wildlife in the project area; however, the construction duration for all phase of work would be reduced by approximately 1 month over the No Action and as analyzed in the 2016 EA, resulting in impacts similar to those previously analyzed, but over a shorter period of time.	No
Essential Fish Habitat	No Change	Modifications would cause temporary, minor disturbances to wildlife in the project area; however, the construction duration for all phase of work would be reduced by approximately 1 month over the No Action and as analyzed in the 2016 EA, resulting in impacts similar to those previously analyzed, but over a shorter period of time.	No
Threatened and Endangered Species	Species have been listed and species presence/absence has changed in the project area since 2016.	Impacts are further disclosed in Section 3.4.	Yes

Cultural Resources	Resource not present	The USACE has determined that the modified plan will have no effect upon historic properties. The Texas SHPO has concurred with this determination.	No
Air Quality	National Ambient Air Quality Standards (NAAQS) have been lowered for ozone.	Impacts are further disclosed in Section 3.5.	Yes
Noise	No change	Noise impacts from dredging are expected to be reduced by approximately 19.5 days as compared to the No Action. Additionally, no dike raising is required so noise impacts associated with that work would not occur. General impacts would be similar to those previously analyzed, but over a shorter period of time.	No
Water Quality	No change – 2021 water quality samples and elutriate sampling indicate water quality is generally good and all detected contaminant levels in all ambient water samples were below applicable EPA Water Quality Criteria and Texas Surface Water Quality Standards. Additionally, no significant spills have been reported since 2016	Dredged material from the additional channel would be placed into the existing PA and not require any modifications to the discharge location or decanting process. The duration of decanting and discharge of effluent would be increased by a couple of weeks over the No Action due to the increased sediment placed into the PA from inclusion of the additional channel. However, the increase would not result in any exceedance of water quality standards and is therefore expected to have negligible impacts beyond those previously analyzed.	No
Sediment Quality	No change	Modifications would be dredging into virgin material; however, based on sampling there is no indication that sediment quality would be different than under the No Action	No
Hazardous, Toxic, and Radioactive Waste	No change	The 2016 EA HTRW assessment included a buffer of 0.25 miles around the Authorized Plan which included the additional channel. No additional impacts beyond those previously analyzed are anticipated.	No
Socioeconomics	Additional docks and wharves have been constructed or redeveloped along the channel shoreline; however, the socioeconomics of the project area have not changed.	No additional impacts beyond those previously analyzed are anticipated.	No
Environmental Justice (EJ)	Updates to EJ mapping and environmental exposure have been completed since 2016.	Impacts are further disclosed in Section 3.7	Yes

Prime and Unique Farmlands	Resource not present	Resource not present	No
Recreational Resources	No change.	Modifications would have no impact on tourism. Temporary impacts to small recreational fishing vessels would be reduced by approximately 19.5 days over the No Action, resulting in impacts similar to those previously analyzed, but over a shorter period of time.	No
Roadways and Traffic	No change.	Modifications are not expected to increase the number of construction workers needed or the number of vehicles beyond what was previously analyzed resulting in negligible to no additional impacts.	No
Aircraft Wildlife Strikes	No change	Elimination of the dike raising would reduce the potential for a higher structure to impede flight paths. No additional impacts beyond those previously analyzed are anticipated.	No

3.2 RESOURCES CONSIDERED FOR ANALYSIS

Table 3 identifies resources considered for impact analysis in the 2016 EA and identifies any changes to the affected environment since 2016 as well as potential impacts from the Proposed Modified Plan. Not all resources present in the project area would be affected by the proposed modifications because there would either be no impact, insignificant/negligible impact, or no change in impact on the resource from that described in the 2016 EA. Resources in which any of these criteria apply have not been evaluated further and the discussion of impacts of the dredging as described in the 2016 EA are incorporated by reference. The cumulative impacts of the Proposed Modified Plan are expected to be the same as the 2016 EA.

The following resources may be affected by the Proposed Modified Plan: Marine Aquatic Resources, Threatened and Endangered Species, Air Quality, Cultural, and Environmental Justice (EJ). Sections 3.3 through 3.7 address these resources further.

3.3 MARINE AQUATIC RESOURCES

3.3.1 Environmental Consequences

3.3.1.1 No Action

During dredging, temporary disturbances and impacts to all life-stages of fisheries, benthic organisms, plankton, and nekton assemblages would occur. Fish within the project vicinity would be expected to swim out of the area avoid direct being injured or killed by dredging equipment. Disturbances to fisheries would be expected to only last as long as dredging operations are active (approximately 1500 hours or 62.5 days) There would be direct impacts to limited benthic organisms present in the channel from being buried or removed during dredging. Recolonization of the area is expected to occur in the same manner as occurs after maintenance dredging occurs.

Indirect effects to marine aquatic organisms from temporary turbidity are expected as a result of the release of sediment in the water column during dredging. The extent of turbidity created by the sediment plume is determined by the direction and strength of the currents, and the sizes of particles (Wilber and Clarke, 2001). Increased concentrations of suspended sediment can temporarily impact benthic macroinvertebrates and juvenile and adult finfish and shellfish by disrupting foraging patterns, reducing feeding rates and effectiveness, burying habitat for feeding and reproduction, and reducing respiration rates by coating gills with sediment (Newcombe and Jensen, 1996; Clarke and Wilber, 2000; Wilber and Clarke, 2001). Finfish and shellfish can avoid highly turbid areas and under most conditions are only exposed to localized suspended-sediment plumes for short durations (minutes to hours) (Newcombe and Jensen, 1996; Clarke and Wilber, 2000; Wilber and Clarke, 2001). Shrimp and crabs are less impacted by elevated suspended sediments since these organisms reside on or near the bottom where sedimentation naturally occurs (Wilber and Clark, 2001; Wilber et al., 2005). Furthermore, turbid waters may actually provide a refuge for these species from predation (Wilber and Clarke, 2001). Research has shown that more-sensitive species and life stages (i.e., eggs, larvae, and fry) are more negatively impacted by longer exposure to suspended sediments than less sensitive species and older life stages (Newcombe and Jensen, 1996; Wilber and Clark, 2001; Germano and Cary, 2005; Wilber et al., 2005). Effects of elevated suspended solids on the adult

stages of various filter feeding organisms such as oysters, copepods, zooplankton and other species include reduced filtering rates, and clogging of filtering mechanisms, interfering with ingestion, respiration, and abrasion; however, effects tend to be more pronounced when concentrations are greater than 100 mg/L but are reversible once turbidities return to ambient levels (Armstrong et al., 1987; Newcombe and Jensen, 1996; Wilber and Clarke, 2001). These impacts would be localized around the immediate area of dredging and turbidities would be expected to return to near ambient conditions within a few hours after dredging ceases in a given area, thus, no long-term effects are anticipated.

Maintenance dredging of the existing -41-foot MLLW portion of the GHC routinely displaces approximately 81 acres of marine benthic channel bottom and affects marine resources present in this area. Based on cross sections of the existing channel template, deepening the project by five feet to a maximum depth of -46 feet MLLW would result in a reduction in the channel bottom width to 1,075 feet, consistent with the remainder of the authorized channel project. Most of the new work dredging would occur at the toe of the channel slope and would only increase the top width on each side by a maximum of seven feet. This increase in top width translates to around 0.8 acre of impact to bay bottom that hasn't been previously disturbed. However, given variations in conditions of channel and elevations of the top of slope dredging will likely widen the side slopes between four and seven feet, or between 0.5 and 0.8 acres. Thus, any impacts to bay bottoms from construction would not be "new," but would be among the cyclical recurring impacts that occur during maintenance of the channel and adjacent berths under the existing condition.

Since, no new permanent effects to aquatic marine resources would occur as a result of the project, no mitigation would be required for this alternative.

3.3.1.2 Proposed Modified Plan

The same direct and indirect impacts described for the No Action would also apply to the Proposed Modified Plan. The only difference is in the footprint that would be disturbed and the duration of disturbance. Under the Proposed Modified Plan, up to 92.8 acres of bay bottom would be dredged, which is anticipated to take approximately 1,032 hours (43 days) to dredge the channel extension and the additional channel. The addition of the t additional channel increased the dredging duration by approximately 14 days; however, the change in the template profile and reduction in sediment quantities is expected to reduce the dredging duration to 29 days for the extension portion of the project, resulting in a net decrease in total disturbance over the No Action.

3.4 THREATENED AND ENDANGERED SPECIES

Wildlife species may be classified as threatened or endangered under the Endangered Species Act (ESA) of 1973 (16 USC § 1531 et seq.). US Fish and Wildlife Service (USFWS) oversees protection of non-marine species or marine species while they are on land (e.g. sea turtles) and National Marine Fisheries Service (NMFS) oversees protection of marine species while in the water. The ESA ensures that federal agencies and departments use their authorities to protect and conserve endangered and threatened species. Section 7 of ESA requires that federal agencies prevent or modify any projects authorized, funded, or carried out by the agencies that

are “likely to jeopardize the continued existence of any endangered species or threatened species, or result in the destruction or adverse modification of critical habitat of such species.”

3.4.1 Affected Environment

Seventeen species listed as endangered, threatened, or candidate were identified and considered in the 2016 Biological Assessment (BA). Since then, six additional species have been identified as potentially occurring in the project area, while eight species are no longer identified as potentially occurring in the project area as indicated in the USFWS Official Species April 21st 2022 and/or on the most recent NMFS Texas’ Threatened and Endangered Species List dated November 03, 2021 (Table 4, Appendix D-2). There is no designated critical habitat in the project area.

Of the 16 identified species, only the West Indian manatee, Kemp’s ridley sea turtle, and loggerhead sea turtle have the potential to occur in the project area. The project area does not support habitat for the remaining 13 species and/or is outside the species known range. The shorelines along the GHC in the vicinity of the Authorized Plan and Proposed Modified Plan predominantly consist of bulkheads and dock facilities with only very small, short stretches of shorelines having shell hash substrates found at the TAMUG Clipper dock area. Additionally, one small wetland is found outside the 500-foot buffer of the project area.

For additional information on each of the species’ habitat needs and the likelihood of the species occurring in the project area, refer to the supplemental Biological Assessment (BA) (Appendix D-2).

3.4.2 Environmental Consequences – No Action and Proposed Modified Plan

The No Action and Proposed Modified Plan would have the same effects to ESA-listed species, since the assessment needs to be updated for the No Action to account for changes in species identified by USFWS and NMFS, so they are discussed together for this resource.

The Supplemental BA documents the impacts of implementing the Proposed Modified Plan on listed species (Appendix D-2). Based upon the findings of the BA, the USACE determined that the two alternatives would have no effect on Attwater’s greater prairie-chicken, piping plover, rufa red knot, eastern black rail, whooping crane, oceanic whitetip shark, giant manta ray, sperm whale, rice’s whale, green sea turtle, hawksbill sea turtle, and leatherback sea turtle due to the lack of suitable habitat in the project area. The following effects determination for species that were identified as occurring or potentially occurring in the action area were made:

- **West Indian manatee**: Due to the rarity of the manatee in the project area and the conservation measures that would be implemented, implementation of the action ***may affect, but not adversely affect*** the West Indian manatee.

- **Kemp’s Ridley and loggerhead sea turtles**: Temporary (~3 months) avoidance and disturbance would occur during construction and maintenance dredging. A hydraulic pipeline dredge would be utilized, which move at sufficiently slow speeds to avoid take. Implementation of the No Action or Proposed Modified Plan ***may affect, but not adversely affect*** these sea turtle species, especially with the conservation measures that would be implemented.

Construction and placement activities would occur within the footprint of the existing channel project. The project area is continuously disturbed by ongoing maintenance dredging activities, commercial shipping and recreational vessel traffic and other human activities making these areas generally unsuitable or undesirable for use by any listed species. Any noise, vibration, ship wakes, decreased water quality, or other impacts induced by dredging operations, vessel movement, or placement activities from implementing the No Action or the Proposed Modified Plan would be of the same type and magnitude as experienced with the periodic maintenance dredging and placement into the Pelican Island PA associated with the authorized Federal project. All impacts would cease after construction is complete.

Table 5 shows the effects determinations for each species.

Table 4. ESA-listed Species Identified as Potentially Occurring in the Project Area

Species	Agency	Status (2016)	Status (2022)	Habitat Needs	Occurrence In or Near the Project Area
Birds					
Attwater's Greater Prairie-Chicken *Tympanuchus cupido attwateri*	USFWS	E	E	Only known to occur in the wild at three locations. Prefer open prairies without any wood cover and avoid areas with more than 25% shrub cover. Knolls and ridges with minor variations in topography and soils resulting in a variety of vegetation types are characteristic of preferred habitat.	No – Outside known range
Piping Plover *Charadrius melodus*	USFWS	T	T	Wintering habitat broadly characterized as emergent tidal or washover areas that are unvegetated to sparsely vegetated with wet to saturated soils near water. Use coastal areas on the mainland and barrier islands, with bay side habitats (bayshore tidal sand and algal flats) serving as the primary habitat unless submerged, then they transition to oceanside beaches, washover passes, and mainland tidal mud flats.	No – No suitable habitat
Rufa Red Knot *Calidris canutus rufa*	USFWS	E	E	Migrating and wintering knots use sandy beaches, saltmarshes, lagoons, mudflats of estuaries and bays, and mangrove swamps that contain an abundance of invertebrate prey.	No – No suitable habitat
Eastern Black Rail *Laterallus jamaicensis ssp. jamaicensis*	USFWS	NR	T	Use tidally or non-tidally influenced wetlands ranging in salinity from salt to brackish to fresh. Require dense vegetation, moist soils, and areas of topographic change where molting birds can escape when areas are flooded.	No – No suitable habitat
Whooping Crane *Grus americana*	USFWS	NR	E	Winters along the Gulf Coast and breeds in Canada. On wintering grounds in Texas, they use estuarine marshes, shallow bays, and tidal flats, sometimes using nearby farms. Salt grass, saltwort, smooth cordgrass, glasswort, and sea oxeye dominate marshes, with Gulf cordgrass on the margins	No – No suitable habitat
Fish					
Ocean whitetip shark *Carcharhinus longimanus*	NMFS	NR	T	Pelagic, generally remaining offshore in the open ocean, on the outer continental shelf, or around oceanic islands in water depths greater than 184 m (~604 feet). They have a strong preference for the surface mixed layer in warm waters above 20°C (68°F).	No – Outside known range

Species	Agency	Status (2016)	Status (2022)	Habitat Needs	Occurrence In or Near the Project Area
Giant manta ray *Manta birostris*	NMFS	NR	T	Commonly found offshore, in oceanic waters and near productive coastlines. Can be found in cool water (>19°C). Observed using estuarine waters near oceanic inlets as nursery grounds. Closest known nursery to the Texas coast is >100 miles offshore at NOAA's Flower Garden Sanctuary.	No – Outside known range
Insects					
Monarch Butterfly *Danaus plexippus*	USFWS	NR	C	Mainly found in prairies, meadows, grasslands and along roadsides, across most of North America, where milkweed, their host plant, is prominent.	No – No suitable habitat
Invertebrates					
Elkhorn coral *Acropora palmata*	NMFS	T	NR	--	--
Lobed star coral *Orbicella annularis*	NMFS	T	NR	--	--
Mountainous star coral *Orbicella faveolata*	NMFS	T	NR	--	--
Boulder star coral *Orbicella franski*	NMFS	T	NR	--	--
Mammals					
West Indian Manatee *Trichechus manatus*	UFWS	E	E	Inhabit marine, brackish, and freshwater systems in coastal and riverine areas. Preferred habitat include areas near the shore featuring underwater vegetation like seagrass and eelgrass. They feed along grass bed margins with access to deep water channels, where they flee when threatened.	Yes –Records in the Bay
Fin whale *Balaenoptera physalus*	NMFS	E	NR	--	--
Humpback whale *Megaptera novaengliae*	NMFS	E	NR	--	--
Sei whale *Balaenoptera borealis*	NMFS	E	NR	--	--

Species	Agency	Status (2016)	Status (2022)	Habitat Needs	Occurrence In or Near the Project Area
Sperm whale *Physeter macrocephalus*	NMFS	E	E	Each of these whales can be found in the warmer waters of the Gulf of Mexico on the continental shelf edge and slope. They are usually observed in deeper waters of oceanic areas far from the coastline.	No – Outside known range
Rice's Whale *Balaenoptera ricei*	NMFS	NR	E		No – Outside known range
Reptiles					
Green sea turtle *Chelonia mydas*	USFWS NMFS	T	T	Primarily found in the Gulf of Mexico, and sub-adults occasionally found feeding in shallow bays and estuaries where marine sea grasses grow. Nest on beaches but nesting not recorded from the upper coast.	No – Outside known range
Hawksbill sea turtle *Eretmochelys imbricata*	USFWS NMFS	E	E	Prefer clear offshore waters of mainland and island shelves and are most common where coral reef formations are present. Nest on beaches but nesting not recorded from upper coast.	No – Outside known range
Kemp's Ridley sea turtle *Lepidochelys kempii*	USFWS NMFS	E	E	Migrates along the Texas coast and generally remains in near shore waters less than 165 feet deep to feed on shrimp, crab, and other invertebrates. Nest on beaches of Galveston Island.	Yes –Records in the Bay
Leatherback sea turtle *Dermochelys coriacea*	USFWS NMFS	E	E	Mainly pelagic, inhabiting the upper reaches of the ocean where deep water comes to the surface (upwelling areas). Nest on beaches but nesting not recorded from upper coast.	No – Outside known range
Loggerhead sea turtle *Caretta caretta*	USFWS NMFS	T	T	Prefer shallow inner continental shelf waters and occur only very infrequently in the bays and estuaries. Often occurs near offshore oil rig platforms, reefs, and jetties. Nests on open, sandy beaches. No nesting recorded from the upper coast.	Yes –Records in the Bay

T= Threatened E= Endangered C= Candidate Species NR= Not on IPaC/Texas NMFS Report

Table 5. Effects Determination for ESA-listed Species

Species	Agency	Status (2016)	Effect Determination (2016)	Status (2022)	Effect Determination (2022)
Birds					
Attwater's Greater Prairie-Chicken	USFWS	E	No effect	E	No effect
Piping Plover	USFWS	T	No effect	T	No effect
Rufa Red Knot	USFWS	E	No effect	E	No effect
Eastern black rail	USFWS	NR	--	T	No Effect
Whooping Crane	USFWS	NR	--	E	No Effect
Fish					
Ocean whitetip shark	NMFS	NR	--	T	No effect
Giant manta ray	NMFS	NR	--	T	No effect
Insects					
Monarch Butterfly	USFWS	NR	--	C	No effect
Invertebrates					
Elkhorn coral	NMFS	T	No effect	NR	--
Lobed star coral	NMFS	T	No effect	NR	--
Mountainous star coral	NMFS	T	No effect	NR	--
Boulder star coral	NMFS	T	No effect	NR	--
Mammals					
West Indian manatee	USFWS	E	No effect	E	NLAA
Fin whale	NMFS	E	No effect	NR	--
Humpback whale	NMFS	E	No effect	NR	--
Sei whale	NMFS	E	No effect	NR	--
Sperm whale	NFMS	E	No effect	E	No effect
Rice's Whale	NMFS	NR	--	E	No effect
Reptiles—In Water					
Green sea turtle	NMFS	T	No effect	T	NLAA
Hawksbill sea turtle	NMFS	E	No effect	E	No effect
Kemp's Ridley sea turtle	NMFS	E	No effect	E	NLAA
Leatherback sea turtle	NMFS	E	No effect	E	No effect
Loggerhead sea turtle	NMFS	T	No effect	T	NLAA
Reptiles – On Land					

Species	Agency	Status (2016)	Effect Determination (2016)	Status (2022)	Effect Determination (2022)
Green sea turtle	NMFS	T	No effect	T	No effect
Hawksbill sea turtle	NMFS	E	No effect	E	No effect
Kemp's Ridley sea turtle	NMFS	E	No effect	E	No effect
Leatherback sea turtle	NMFS	E	No effect	E	No effect
Loggerhead sea turtle	NMFS	T	No effect	T	No effect

NLAA = Not likely to adversely affect

3.5 AIR QUALITY

The Clean Air Act (CAA), as amended in 1990, regulates air emissions from area, stationary, and mobile sources, and requires the EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. Currently, there are air quality standards for six "criteria" pollutants designated by EPA; ozone, lead (Pb), carbon monoxide (CO), nitrogen oxides (NO_x), sulfur dioxide (SO_2), and inhalable and fine airborne particulate matter ($PM_{2.5}$ and PM_{10}).

Primary standards provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

The EPA directs states to develop state implementation plans (SIPs) applicable to appropriate industrial sources in the state in order to achieve these standards. The Texas Commission on Environmental Quality (TCEQ) is responsible for facilitating the state's responsibilities for NAAQS attainment issues, air emissions permitting, and development and enforcement of air regulations and initiatives. Pursuant to the General Conformity Rule of the CAA, a Federal agency such as the USACE must make a General Conformity Determination for all Federal actions in nonattainment areas where the total emissions of a nonattainment pollutant or its precursors exceeds levels ("*de minimis*") established by the regulations.

3.5.1 Affected Environment

The proposed GHCE Project is located in Galveston County, Texas. This county is included in the eight county Houston-Galveston-Brazoria (HGB) ozone nonattainment area which is classified as "moderate" nonattainment under the 2015 ozone NAAQS and "severe" under the 2008 8-hour ozone standard. This classification affects facilities that generate the ozone precursors, oxides of NOx and VOC. As such, this project is subject to the General Conformity Rule which applies to all nonattainment and maintenance areas.

The general conformity *de minimis* threshold is 25 tons per year (tpy) for either nitrogen oxides (NO_X) or volatile organic compounds (VOC). In addition, even if the total emissions of VOC or NO_X do not exceed the 25 tpy threshold levels, when the total emissions of any pollutant from the Federal action represents 10 percent or more of a nonattainment or maintenance area's

total emissions of those pollutants, then the action is defined as a regionally significant action and a conformity determination would still be applicable (Table 6). Only those air emissions of NOx and VOC related to the Federal action, *i.e.*, those considered to be implemented by the USACE, should be considered when evaluating the project with regard to the *de minimis* threshold and compliance with the General Conformity Rule.

Table 6. NAAQS for Criteria Pollutants

40 CFR 93.153(b)(1) - For purposes of paragraph (b) of this section the following rates apply in nonattainment areas (NAA's):	
	Tons/year
Ozone (VOC's or NOx):	
Serious NAA's	50
Severe NAA's	25
Extreme NAAs	10
Other ozone NAA's outside an ozone transport region:	100
Other ozone NAA's inside an ozone transport region:	
VOC	50
NOx	100
Carbon Monoxide: All maintenance areas	100
SO_2 or NO_2: All NAA's	100
PM_{10}:	
Moderate NAA's	100
Serious NAA's	70
$PM_{2.5}$ (direct emissions, SO_2, NOx, VOC, and Ammonia):	
Moderate NAA's	100
Serious NAA's	70
Pb: All NAA's	25

3.5.1.1 Mobile Emissions Sources

The primary pollutants produced through mobile emission sources are CO, NO_x, hydrocarbons, and PM. Emissions produced by ships and other marine vessels can be much lower than other transportation modes when considering their tonnage. For example, emissions from utilizing barges for transportation were compared and found to generally be much lower than those produced by to truck or rail transportation. The Texas Transportation Institute evaluated the emissions produced by three modes of transportation: truck (highway), rail (train), and inland towing (barge). Depicted in Table 7 below, the impact on air quality from the use of barges through inland navigation towing is significantly less than other modes of transportation, resulting in the utilization of less fossil fuels and production and release of fewer air pollutants.

Table 7. Fuel Efficiency and Emissions of Transportation Modes

transportation mode	ton-miles/gallon of fuel	emissions (tons-emissions/10^6 ton-miles)
truck	155	71.61
rail	413	26.88
inland towing	576	19.27

3.5.2 Environmental Consequences

The CAA contains provisions under the General Conformity (GC) Rule (GCR) to ensure that actions taken by Federal agencies in air quality NAA and maintenance areas do not interfere with a state's plans to meet national standards for air quality. Under the GCR, Federal agencies must work with state, Tribal and local governments in a NAA or maintenance area to ensure Federal actions conform to the air quality plans established in the applicable SIP.

Under the GCR, certain actions are exempted from conformity determinations, while others are presumed to be in conformity if total project emissions (including direct and indirect emissions controlled by the agency) are below *de minimis* levels as established under 40 CFR Section 93.153. *De minimis*, emission levels for a project are established and expressed in tons per year (tpy) based on the severity of an area's air quality problem. Before any action can be taken, Federal agencies must perform an applicability analysis to determine the relationship of total project emissions to *de minimis* thresholds. Exceedance of a *de minimis* threshold requires preparation of General Conformity Determination (GCD) for that pollutant. If the emissions are below all the *de minimis* levels, the project is presumed to conform under the regulation. For actions that are otherwise exempt (such as maintenance dredging), the agency does not have to conduct a conformity determination.

Because the HGB NAA ozone classification changed in 2019, the *de minimis* threshold of 100 tpy for VOCs considered in the 2016 EA needs to be revised and total project emissions now need to be compared to 25 tpy established for severe NAA. The following is a summary of the conclusions drawn from the air emissions analysis completed for the project. Appendix D-3 contains detailed information including assumptions and modeling spreadsheets.

3.5.2.1 No Action

New work dredging would produce construction emissions from main and auxiliary engines of the dredge and its support equipment (e.g. tugs and tenders). Dredged material placement emissions would be produced by earthmoving equipment.

Construction of this alternative is anticipated to begin in 2024 and is expected to continue for approximately 4 months. Construction would be considered a one-time activity and baseline conditions would be expected to resume when construction is complete. Maintenance dredging would continue to produce emissions at the same frequency and magnitude as current maintenance dredging operations since deepening is not expected to increase the amount of material removed during maintenance dredging.

The No Action is not expected to increase the number of vessels using the channel, as the project is only intended to improve navigational efficiencies. With the elimination of light loading practices, fewer trips by smaller vessels would offset the emissions of a larger vessel traveling further down the channel resulting in negligible change in long-term operational emissions.

The emissions for the No Action were estimated to determine the applicability of the GC rules in the 2016 EA. Emission estimates for each engine type have been calculated by multiplying horsepower by load factor by operating hours, multiplied by emission factors in units of grams per horsepower hour (g/hp hr). Emission factors have been chosen for marine and other nonroad engines to be relatively conservative as to calculate a maximum emission scenario. The 2016 analysis indicated that short-term project construction emissions of both ozone precursors, NO_x and VOC, would amount to 106.4 and 1.62 tons per year, respectively. When compared to the updated *de minimis* thresholds of 25 tpy the No Action would exceed those thresholds and require a GCD. However, since the 2016 EA deferred compliance to PED, these values needed to be updated to coincide with more precise dredging quantities and duration. As a result, the updated No Action annual project emissions for NOx and VOC is estimated at 37.11 tpy and 0.51 tpy (Table 8).

Table 8. Updated No Action Annual Project Emissions

	Annual Emissions (tpy)					
Emitter	**CO**	**NO_x**	**$PM_{2.5}$**	**PM_{10}**	**SO_2**	**VOC**
Dredge & Support Equipment	4.55	37.11	0.84	0.89	6.18	0.49
Construction Equipment	0.206	0.108	0.005	0.005	0.001	0.011
Employee Vehicles	0.196	0.014	--	--	--	0.015
Total	4.95	37.23	0.85	0.89	6.18	0.51

3.5.2.2 Proposed Modified Plan

The Proposed Modified Plan would have the same general impacts on air quality except that the emissions produced are slightly higher due to the addition of the additional channel. The NOx emissions are estimated at 13.77 tpy, which does not exceed the *de minimis* threshold of 25 tpy, while VOC is far below the *de minimis* threshold at 0.50 tpy (Table 9). Nearly all of the emissions come from the dredging operation. While emissions of CO, SO_2, and PM would be generated during implementation, the amount produced is not expected to cause the area to exceed NAAQS for any of these pollutants or cause the area to not be in attainment.

Table 9. Emissions Produced by the Proposed Modified Plan

	Annual Emissions (tpy)					
Emitter	**CO**	**NO_x**	**$PM_{2.5}$**	**PM_{10}**	**SO_2**	**VOC**
Dredge & Support Equipment	2.10	13.75	0.39	0.30	0.01	0.49

Construction Equipment	-	-	-	-	-	-
Employee Vehicles	0.116	0.015	-	-	-	0.02
Total	2.21	13.77	0.39	0.30	0.01	0.50

For comparison to the SIP Area Source Emissions budget, the annual NOx emission rates estimated for the Proposed Modified Plan may be summarized in terms of tons per day and compared to the SIP emissions budget. As shown in Table 9, emissions for the Proposed Modified Plan emissions would represent less than 2/100 of one percent of the SIP 2020 total emissions for NOx from all sources and less than 1/1000th of one percent of the total VOC emissions from all sources within the eight counties that comprise the HGB area.

Table 10. Comparison of Project Emission to the SIP

	NO_x	**VOC**
Proposed Modified Plan On-Road mobile (tpy)	0.015	0.002
HGB 2020 On-Road mobile (tpy)	29,030	19,070
Percentage of On-Road Mobile	0.00005%	0.00001%
Proposed Modified Plan Total (tpy)	13.8	0.50
HGB 2020 Eight County Total (tpy)	116,157	175,287
Percentage of HGB 2020 Total	0.01185%	0.00028%

Based on an evaluation of the Proposed Modified Plan emissions, it is believed that the total emissions of NOx and VOC would result in levels that are below the de minimis threshold values and less than 10% of the values for the most recently approved SIP revision (2020). As the GHCE Project is not unusual in scope for an area like the HGB, it is anticipated that emissions from the project will be less than an increase of 1% of the VOC and NOx emissions for the entire HGB nonattainment area. Therefore, emissions form the activities subject to the USACE action are not considered regionally significant for purposes of General Conformity. Because of this, it is expected that emissions from the project construction will not:

- Cause or contribute to new violations of any NAAQS in any area;
- Increase the frequency or severity of any existing violation of any NAAQS in any area; or
- Delay timely attainment of any NAAQS or interim emission reductions or other milestones in any area.

3.6 GREENHOUSE GAS EMISSIONS

Executive Order 13990, “Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis,” as well as Executive Order 14008, “Tackling the Climate Crisis at Home and Abroad,” prioritize reducing greenhouse gas (GHG) emissions to combat the impacts of climate change. In line with these Executive Order directives, CEQ produced the “National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change,” dated January 9, 2023. This guidance requires NEPA reviews to quantify proposed actions’ GHG emissions, disclose relevant GHG emissions and relevant climate impacts, and identify alternatives and mitigation measures to avoid or reduce GHG emissions. In order to comply with the applicable EOs, regulations, laws, and guidance on GHG emissions, GHG emissions are estimated for the GHCE project alternatives.

3.6.1 Affected Environment

3.6.1.1 Climate

Since 1880, analysis of climate data from has shown that the Earth’s surface temperature has increased by more than 1.4 degrees Fahrenheit over the past 100 years, with much of the increase taking place over the past 35 years (National Research Council 2012). Warming temperatures are often attributed to an increase in greenhouse gas (GHG) emissions, particularly carbon dioxide, which increased 80 percent between 1970 and 2004 (IPCC 2023). To model future climate change, scientists use general circulation models (GCM). Climate change analysis becomes more complex for the future than the past because there is not one time-series for climate, but rather many future projections from different GCMs with a range of carbon dioxide emissions scenarios (IPPC 2023). It is important not to analyze only one GCM for any given emission scenario, but rather to use ensemble analysis to combine the results of multiple GCMs and quantify the range of possibilities for future climates under different emissions scenarios. Human population growth, related GHG emissions, and changes in land cover have been modeled under various scenarios to project future trends for global temperature and precipitation.

In May 2008, the Center for Climate Strategies (CCS) completed a GHG emissions inventory and reference case projection to assist in understanding past, current, and possible future GHG emissions in Arkansas (CCS 2008), which can also be applied to the study area in Texas due to the proximity and similarities in land use and emission contributors.

The report found that GHG emissions are rising faster than those of the nation as a whole. As is common in many states, the electricity and transportation sectors have the largest emissions, and they are expected to continue to grow faster than other sectors. The study also found that from 2005 to 2025, emissions associated with electricity generation to meet both in-state and out-of-state demand are projected to be the largest contributor to future emissions growth, followed by emissions associated with the transportation sector. Other sources of emissions growth include the residential, commercial, and industrial fuel use sectors, the transmission and distribution of natural gas, and the increasing use of hydrofluorocarbons and perfluorocarbons as substitutes for ozone depleting substances in refrigeration, air conditioning, and other applications.

As a result of increased emissions, the U.S. Southeast which includes Texas show a temperature increase of 4 to 8 degrees Fahrenheit by 2100 (IPCC 2023). Major consequences of warming include a significant increase in the number of hot days (above 95 degrees Fahrenheit) each year and an overall decrease in freezing events and frosts. Plant growing seasons would likely become longer and the types of plants that can survive may change.

Though there is a great deal of uncertainty among the scenarios in projected precipitation amounts, rising temperatures will account for an increased rate of evapotranspiration and a decrease in available water. Further, climate change models project that precipitation will be produced in fewer and heavier rainfall events. If so, this could lead to a decrease in aquifer recharge because more rainfall would be lost to runoff and could also result in an increase in both drought and flooding events. The southeast region is thus predicted to see a significant reduction in water availability (Kunkel et al., 2013).

3.6.1.1.1 Extreme Weather Events

The changing climate may increase inland flooding, particularly in communities along major rivers and in the study area. Since 1958, the amount of precipitation falling during heavy rainstorms has increased by 27 percent in the southeast and the trend toward increasingly heavy rainstorms may continue. Both annual rainfall and stream flows in the Midwest are increasing, and that trend is likely to continue (EPA 2016). An increase in intensity and frequency of flooding would be expected, leading to a higher probability of overtopping, flanking, and/or seepage of existing containment structures that could result in catastrophic breaches.

Although climate change may increase the risk of flooding, droughts might become more severe. Droughts may be more severe because periods without rain will be longer and very hot days will be more frequent. Droughts pose challenges for water management and river transportation. If the spring is unexpectedly dry, reservoirs may have too little water during the summer resulting in the inability to maintain reliable and safe navigation depths, narrowed navigation channels, and forced lock closures. If droughts become more severe, restrictions on shipping may be implemented (EPA 2016).

3.6.1.2 Emission Sources

GHGs are those gases that trap heat in the atmosphere, including carbon dioxide (CO2), methane (CH4), N2O, and fluorinated gases. While some GHGs are produced through natural processes, anthropogenic sources of GHG emissions include the burning of fossil fuels, solid waste, and biological materials; certain chemical reactions, such as cement production; livestock and other agricultural practices; land use; decaying of organic waste; industrial activities; and various household, commercial, and industrial applications and processes. ¬CO2 emissions make up almost 80% of national GHG emissions, and 35% of CO2 emissions are related to transportation (EPA 2023b). Although natural processes like plant photosynthesis can absorb some anthropogenic GHG emissions, current production rates are causing a continued increase in atmospheric concentrations of GHGs, which may raise the average surface temperature of earth over time. Rising temperatures can produce changes in precipitation patterns, storm severity, and sea level. These impacts are collectively referred to as climate change.

Similar to the NAAQS sources listed in section 3.5, significant sources of GHGs in the study area include industrial sources such as power plants, petroleum refining, and other product plants utilizing chemicals; transportation, primarily by road and rail; and agricultural practices.

3.6.2 Environmental Consequences – No Action and Proposed Modified Plan

Because inland navigation is comparatively more energy efficient than other modes of transportation, the GHGs emitted in the short-term during construction and in the long-term as towboats utilize the deepened channel may cause negligible adverse impacts to GHG trapped in the atmosphere, but emissions by weight of goods transported will be much less than rail and highway.

The EPA GHG Reporting Program requires reporting of GHG data and other relevant information from large GHG emission sources, fuel and industrial gas suppliers, and CO2 injection sites in the US. The reporting is not required for direct emission sources that have annual emissions of less than 25,000 metric tons of CO2e, which is the threshold for significance for this SEA. Since the yearly emission of CO2e for the GHCE alternatives would be below this threshold, impacts from implementation of the proposed action would not be significant and the proposed action will not be reported to the EPA GHG Reporting Program.

3.6.2.1 Construction Emissions

Construction activities associated with the dredging and placement would generate GHG emissions from the use and the combustion of fossil fuels while operating marine equipment and on- and off-road mobile sources. The primary GHGs generated during construction are CO2, CH4, and N2O. The other GHGs such as hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are typically associated with specific industrial sources and processes and would not be emitted during construction. After construction is complete, all GHG emissions would cease, and the area would return to baseline conditions.

In year during which construction activities are implemented, emissions would incrementally contribute to global emissions but will not be of such magnitude as to have a direct correlation with climate change (i.e., emissions less than 25,000 metric tons of CO2e/year).

The CO2 emissions are highly correlated to fuel use. Approximately 99 percent of the carbon in diesel fuel is emitted in the form of CO2 (EPA 2005). EPA quantified the effect of other GHGs in terms of their carbon dioxide equivalent (CO2e), or a common unit of measure for GHGs, using emissions factors that are based on vehicle and equipment emission test results and fuel characteristics. Factoring in the global warming potential (GWP) of each fuel provides a vehicle's CO2 equivalent (CO2e) emissions. The GWP is a relative measure of how much heat a GHG traps in the atmosphere. It compares the amount of heat trapped by a certain mass of the GHG in question to the amount of heat trapped by a similar mass of CO2. Title 40 CFR, Part 98, Subpart C provides guidance on computing the GHG emissions when fuel type and consumption are known.

To calculate estimated GHG emissions resulting from the No Action and Proposed Modified Plan, the following assumptions were used:

- the amount of time to complete construction is 4.0 months and 3.2 months respectively;

- the majority of GHG emissions result from the dredging and placement construction activity neglecting minor contributions from worker vehicles; and
- fuel consumption is correlated to the CO2e emissions rate.

Fuel consumption used by construction equipment during dredging operations was deduced from cost estimates formulated in Micro-Computer Aided Cost Estimating System Second Generation (MII) and Cost Engineering Dredge Estimating Program (CEDEP) software. The consumption rate for a 30-inch pipeline dredge of 534 gallons/hour was multiplied by the total of total number of hours to obtain a total fuel consumption in gallons (Table 11). Note that a portion of this fuel is attributed to advanced maintenance dredging and overdepth dredging that were omitted from the emissions computed for CAA compliance.

Table 11. Inputs for Calculating GHG Emissions

	No Action	Proposed Modified Plan
Duration of Dredging (24-hr operation)	4 months	2,336 (3.2 months)
Total Fuel Consumption (gallons)	1,527,920	1,247,424

This estimated fuel quantity was then utilized to calculate the resulting estimated GHG emissions, specifically CO2, CH4, and N2O. 40 CFR 98 Subpart C provides High Heat Values (HHVs) and default CO2 emissions factors (EFs) for various fuel types, and distillate fuel oil metrics were used for the purposes of this analysis. Total CO2, CH4, and N2O emissions were calculated. To determine the sum of total GHG emissions, the emissions for each type of GHG were standardized to the CO2e. Table 12 depicts the emissions calculations for the "worst case" scenario for each alternative. In both alternatives, the metric tons of CO2e emitted are estimated to be below the level established for reporting of 25,000 metric tons CO2e. The Proposed Modified Plan is slightly higher due to the increase in dredging requirements for the 505 feet of channel extension.

Table 12. Estimated GHG Emissions

GHG	fuel (gal)	HHV (MMBtu/gal)	EF Coefficient (kg CO_2/MMBtu)	total (metric tons)	GWP	CO_2e (metric tons)
No Action						
CO_2	1,527,920	0.138	73.96	15,696.75	1	15,696.75
CH_4	1,527,920	0.138	0.0030	0.64	25	15.9
N_2O	1,527,920	0.138	6.00E-04	0.13	298	37.9
No Action Total (4.0 months)						**15,751**
Proposed Modified Plan						
CO_2	1,247,424	0.138	73.96	12731.8	1	**12,731.81**
CH_4	1,247,424	0.138	0.0030	0.52	25	**12.9**
N_2O	1,247,424	0.138	6.00E-04	0.10	298	**30.8**
Proposed Modified Plan Total (3.2 months)						**12,775.50**

3.6.2.2 Operational GHG Emissions.

Over the life of the project, the navigation channel would allow marine vessels with deeper draft and towboats to push heavier barges carrying more goods. The increased weight and draft of the vessels and barges may require towboats to use more horsepower producing an increase in emissions. However, the greater barge and vessel capacity may allow for better efficiencies, including fewer trips, that would result in a negligible net change in annual GHG emission rates.

3.7 CULTURAL RESOURCES

3.7.1 Affected Environment

The authorized plan was previously surveyed as described in the report titled Underwater Investigations, Houston-Galveston Navigation Channels, Texas Project; Galveston, Harris, Liberty, and Chambers Counties, Texas, prepared by Espey, Huston, and Associates, and dated 1992. This survey did not identify any significant anomalies within the area of potential effect for this project. Furthermore, the dredging and maintenance of the 41- foot channel depth would have resulted in the destruction of any cultural resource had they been present. The upland PA occurs in an area that was created in modern times. The area of potential effect for the proposed project does not include any cultural resources listed on, eligible for listing on, or currently unevaluated for listing on the National Register of Historic Places.

3.7.2 Environmental Consequences

The proposed work outlined in the original feasibility study was coordinated with the Texas State Historic Preservation Officer (SHPO) in 2008 and they concurred that the proposed channel deepening portion of the authorized plan would have no effect on historic properties and that the proposed upland PA has no potential to effect historic properties. For the channel addition at the end of the terminus of the channel, the USACE coordinated with the Texas SHPO in 2022. The SHPO concurred with the previous 2008 determination and with the USACE's determination that the 505-foot channel extension would have no effect upon historic properties. The construction contractor shall immediately stop all work in that area and notify the USACE Staff Archeologist should any cultural resources be discovered during construction. The USACE Staff Archeologist will coordinate any unanticipated discoveries with the SHPO, as necessary.

3.8 ENVIRONMENTAL JUSTICE

Environmental justice (EJ) is the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, to develop, implement, and enforce environmental laws, regulations, and policies. This goal will be achieved when everyone enjoys the same degree of protection from environmental and health hazards, and equal access to the decision-making process to live, learn, and work in a healthy environment.

The Assistant Secretary of the Army for Civil Works (ASA(CW)) memorandum, Implementation Guidance for Section 160 of the Water Resources Development Act of 2020, Definition of Economically Disadvantaged Community, dated 14 March 2023 defines an economically disadvantaged community as meeting one or more of the following:

a) Low per capita income - The area has a per capita income of 80 percent or less of the national average;

b) Unemployment rate above national average - The area has an unemployment rate that is, for the most recent 24-month period for which data are available, at least 1 percent greater than the national average unemployment rate;
c) Indian country as defined in 18 U.S.C. 1151 or in the proximity of an Alaska Native Village;
d) U.S. Territories; or
e) Communities identified as disadvantaged by the Council on Environmental Quality's Climate and Economic Justice Screening Tool (https://screeningtool.geoplatform.gov).

3.8.1 Affected Environment

The project area is within the Census Block group 48167724101, which has a population of 1,036 people and an area of 21.36 mi^2 (7.09 mi^2 land and 14.27 mi^2 water). Of the 1,036 people, 879 people (85%) are reporting as white, 55 people (5%) are reporting as black, 75 people (7%) are reporting as Asian, 7 people (1%) are reporting as Other Race, and 20 people (2%) are reporting two or more races, with no individuals reporting as American Indian or Pacific Islander. A total of 299 individuals (29%) are reporting as Hispanic. A total of 1,011 individuals (98%) are between the ages of 18 and 64, while 17 (2%) individuals are between the ages of 0 and 4, 25 individuals (2%) are between 0 and 17, and 7 individuals (1%) are 65 or older. Of the 121 households in the census tract, 5 households are linguistically isolated (Spanish). The census block would not be considered a minority population because minorities do not represent more than 50 percent of the community.

The ACS data did not report number of households classified as low income, so the Department of Human Health and Services' 2022 average poverty level threshold of $26,500 (total annual income) for a family of four was used. Seventy-seven households (64%) have a total household income of $25,000 or less, making this census block a low-income community because it is significantly higher than the State of Texas poverty level of 13.4 percent and the Galveston County poverty level of 9.9 percent. All demographic information has been captured from the American Communities Survey (ACS) 2015-2019 (Census Bureau 2020).

The EPA EJSCREEN tool (v2.0) was used to identify EJ populations in or near the project area. The EPA issued guidance in 2016 that indicates when using EJSCREEN, any geographic areas at or above the 80th percentile nationally for any EJ indexes should be considered for further review and/or outreach (EPAb 2016). The demographic index of the census block is in the 84th percentile of the US (Figure 8), 71st percentile of the state, and 75th percentile of the EPA region. Six additional EJ Indices were at or above the 80th percentile of the US including: low-income in the 98th percentile, unemployment rate in the 92nd percentile (Figure 9), diesel particulate matter in the 83rd percentile, lead paint in the 80th percentile, proximity to a superfund site in the 82nd percentile, and proximity to an RMP facility (facilities that use extremely hazardous substances) in the 85th percentile (Figure 10).

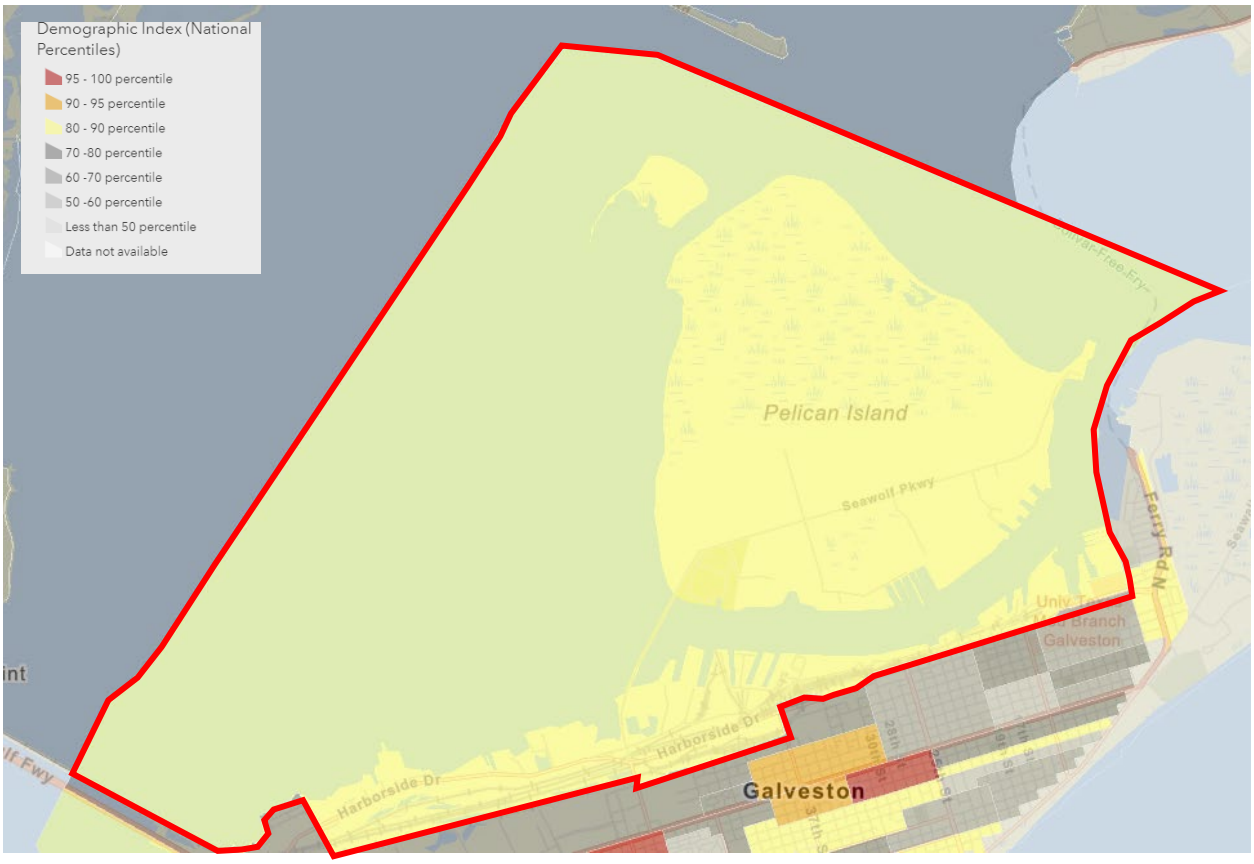

Figure 8. Demographic Index of the Census Block Encompassing the Project Area (Red outline is census block)

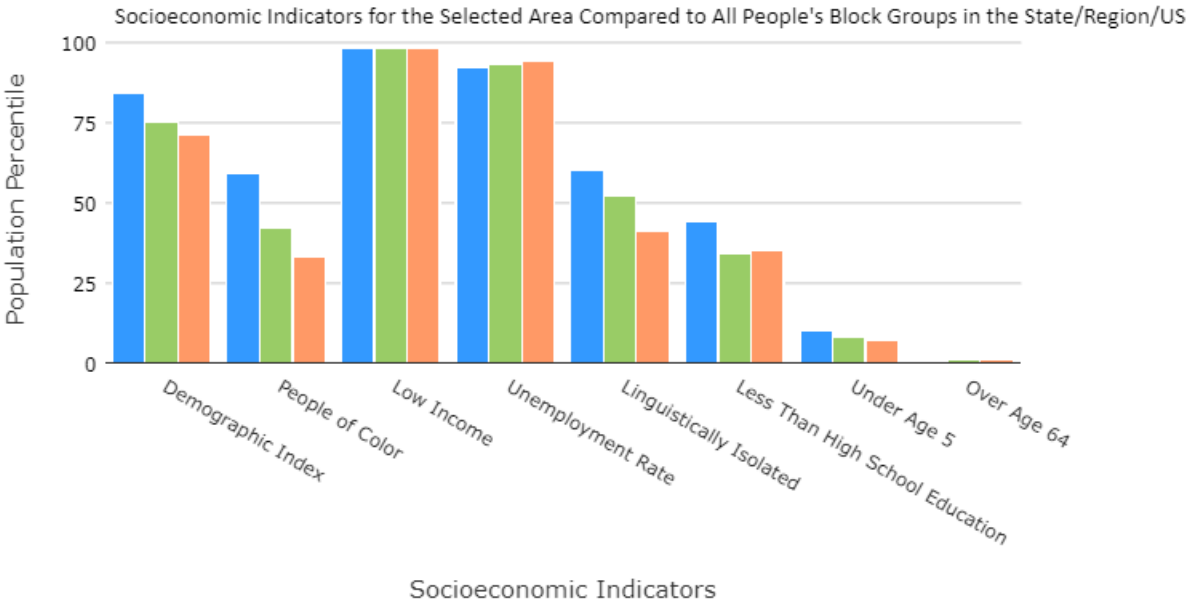

Figure 9. Socioeconomic Indicators for the Census Block of the Project Area

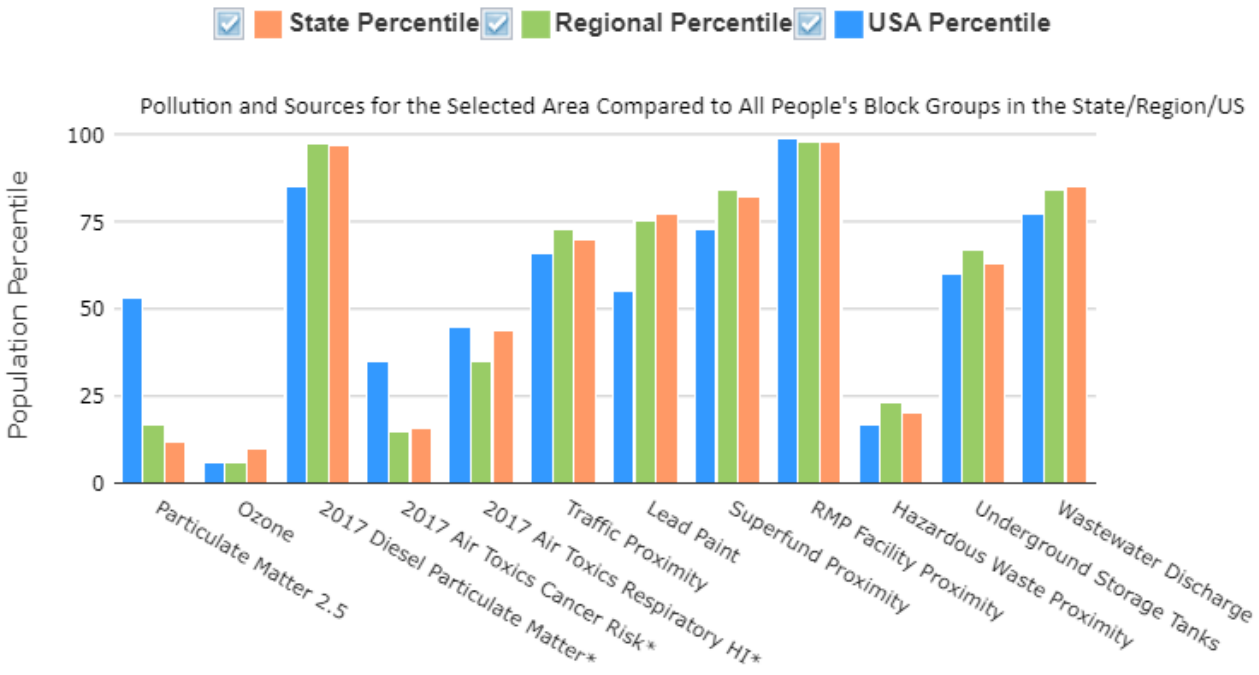

Figure 10. Pollution and Sources Indicators for the Census Block of the Project Area

*The CEJST was also used to identify economically disadvantaged communities and then considered how these communities may be impacted by the proposed action. A larger area was examined using this tool including census blocks 4816774101, 48167724800, 48167724400, 48167724700, 4816772500, 48167725100, 48167724000, 48167724500, 48167725800, 48167724600, 48167725200, and 48167725400 with a population of 27,462 (**Error! Reference source not found.**). The CEJST tool uses burden indicators to identify economically disadvantaged communities. These indicators are reported in percentiles. Percentiles are used to show how the residents in the project area compare to the rest of the state and nation. The purpose of identifying these economically disadvantaged communities is to ensure that the federal action will not have a disproportionate impact on these communities when compared to other communities. Disadvantaged indicators in the project area are listed in*

Table 13.

Figure 11. CEJS tool economically disadvantaged community in project area

Table 13. CEJST economically disadvantaged community indicators

Threshold	Socioeconomic Threshold	Definition	Criteria Met
Health	Diabetes	Share of people ages 18 years and older who have diabetes other than diabetes during pregnancy	Above 90th percentile
Health	Low life expectancy	Average number of years a person can expect to live	Above 90th percentile
Climate Change	Expected building loss rate	Economic loss to building value resulting from natural hazards each year	Above 90th percentile
Climate Change	Projected flood risk	Projected risk to properties from projected floods, from tides, rain, riverine and storm surges within 30 years	Above 90th percentile
Climate Change	Expected population loss rate	Fatalities and injuries resulting from natural hazards each year	Above 90th percentile
Energy	Energy cost	Average annual energy costs divided by household income	Above 90th percentile
Housing	Historic underinvestment	Census tracts with historically high barriers to accessing home loans	Above 90th percentile
Housing	Housing cost	Share of households making less than 80% of the area median family income and spending more than 30% of income on housing	Above 90th percentile
Housing	Lead paint	Share of homes that are likely to have lead paint	Above 90th percentile
Housing	Lack of green space	Amount of land, not including crop land, that is covered with artificial materials like concrete or pavement	Above 90th percentile
Housing	Lack of indoor plumbing	Share of homes without indoor kitchens or plumbing	Above 90th percentile
Legacy Pollution	Proximity to Risk Management Plan facilities	Count of Risk Management Plan (RMP) facilities within 5 kilometers	Above 90th percentile
Legacy Pollution	Formally Used Defense Sites	Presence of one or more Formerly Used Defense Site within the tract	Yes
Water and wastewater	Underground storage tanks and releases	Formula of the density of leaking underground storage tanks and number of all active underground storage tanks within 1,500 feet of the census tract boundaries	Above 90th percentile
Health, Climate Change, Energy, Housing, Legacy Pollution, Water and wastewater	Low Income	People in households where income is less than or equal to twice the federal poverty level, not including students enrolled in higher ed	Above 65th percentile
Workforce Development	Linguistic isolation	Share of households where no one over age 14 speaks English very well	Above 90th percentile

Threshold	Socioeconomic Threshold	Definition	Criteria Met
Workforce Development	Low median income	Comparison of median income in the tract to median incomes in the area	Above 90th percentile
Workforce Development	Unemployment	Number of unemployed people as a part of the labor force	Above 90th percentile
Workforce Development	Poverty	Share of people in households where income is at or below 100% of the Federal poverty level	Above 90th percentile
Workforce Development	High school education	Percent of people ages 25 years or older whose high school education is less than a high school diploma	Above 10%

3.8.2 Environmental Consequences

3.8.2.1 No Action

Because this area routinely experiences dredging operations in the project area and the No Action would have a very small increase in dredging duration and sediment removed over maintenance dredging actions, impacts greater than those experienced under the existing conditions would be negligible. Additionally, channel deepening would not increase the number of vessels using the channels, change the commodities being handled at the Port and private facilities, induce development along the shoreline, or displace residents. Minor, temporary increases in noise would be experienced within 1,000 feet of the channel as a result of operating the dredge; however, the increase is expected to be similar in magnitude and scope as the existing condition. Therefore, the No Action is not expected to change the socioeconomics, job opportunities (unemployment rate), or cohesion of the low-income communities in and near the census block and project area.

When considering the other EJ Indices specifically related to chemical and other adverse factors, only temporary increases in emissions of diesel particulate matter could potentially affect low-income communities; however, as stated previously, dredging would negligibly increase the duration of dredging and therefore emittance of diesel particulate matter over the No Action. With the elimination of light-loading practices, fewer trips by smaller vessels would offset the amount of diesel particulate matter emitted by a larger vessel traveling further down the channel and may even result in communities being exposed to less diesel particulate matter over the long-term under operational conditions.

There would be no change in commodities or shoreline development or re-development of structures potentially painted with or handling lead based paint, so the No Action would not increase the exposure of low-income communities to lead paint. Regarding the proximity to a superfund site, the nearest facility is over 5 miles away and would not be in any way affected by the project. Multiple RMP facilities are located within 5 miles of the project area; however, the project would not create a situation in which the facilities are more vulnerable to damage as each are well beyond the footprint of the channel dredging and placement activities; therefore, implementation of the No Action would also have no effect on these facilities.

The No Action is not anticipated to cause a disproportionately high and adverse impact on the EJ community near the project area.

3.8.2.2 Proposed Modified Plan

The impacts described for the No Action would also apply to the Proposed Modified Plan; however, this alternative would result in a shorter dredging duration to account for the additional footprint.

The Proposed modified plan is not anticipated to cause a disproportionately high and adverse impact on the EJ community near the project area.

4.0 ENVIRONMENTAL COMPLIANCE

The 2016 EA was prepared to satisfy the requirements of and compliant with all applicable environmental laws and regulations. Compliance with the following environmental laws and regulations is not necessary because of lack of the regulated resource in the project area or no effect to the regulated resource: National Historic Preservation Act (NHPA), Coastal Barrier Resources Act (CBRA), Executive Order (EO) 11990 – Protection of Wetlands, Farmland Protection Policy Act (referred to as CEQ Memorandum Dated August 11, 1980 – Prime or Unique Farmlands in the 2016 EA), and Memorandum of Agreement Between the Federal Aviation Administration - Aircraft Wildlife Strikes.

Implementation of the Proposed Modified Plan would not change the conclusions and fall within the compliance status described in the 2016 EA for the following laws: Magnuson-Stevens Fishery Conservation Management Act (MSFCMA), Coastal Zone Management Act (CZMA), Fish and Wildlife Coordination Act (FWCA), Clean Water Act (CWA) Section 401 and 404, EO 11988 Floodplain Management, Migratory Bird Treaty Act (MBTA), and EO 13112 – Invasive Species. A Resource agency meeting was held in April 2022 with USFWS, NMFS, Texas General Land Office (GLO), and Texas Commission on Environmental Quality (TCEQ) informing them of the proposed design change to extend the channel and remove the dike raise and that these proposed design changes are not expected to trigger re-initiation under MSFCMA, FWCA, CZMA, and CWA Section 401. At the April 2022 meeting, no concerns were raised by the resources agencies.

This Proposed Modified Plan is compliant with Section 404 under the CWA as described in the 2016 EA due to the same type of activities below ordinary high water in the same project area and use of the same placement area as the 2016 EA. In addition, a Section 404(b)1 evaluation was prepared for the 2016 EA and can be found in Appendix F of the 2016 EA.

Letters were sent on January 22, 2024 to the resource agencies informing them of the public comment period for this SEA. In addition, these letters to USFWS and NFMS also requested informal consultation. The letter to TCEQ also stated that this proposed project would not require a CWA Section 401 water quality certification. TCEQ responded via email confirming no Section 401 under CWA would be needed for the proposed project. The letters and TCEQ email can be found in Appendix D-4.

Table 14 Compliance Status

Title of Law	2016 Compliance	2024 Compliance
Magnuson-Stevens Fishery Conservation Management Act		Compliance status the same as 2016 EA: No re-initiation triggered
Coastal Zone Management Act	Compliance letter received July 17, 2013	Compliance status the same as 2016 EA: No re-initiation triggered

Title of Law	2016 Compliance	2024 Compliance
Coastal Barrier Improvement Act	Compliant	Compliance status the same as 2016 EA: No re-initiation triggered
Migratory Bird Treaty Act	Compliant	Compliance status the same as 2016 EA: No re-initiation triggered
Fish and Wildlife Coordination Act	Planning aid Letter received January 14, 2011, Compliant	Compliance status the same as 2016 EA: No re-initiation triggered
Clean Water Act- Section 401	Water quality certification received July 9, 2013, Compliant	Compliance status the same as 2016 EA: No re-initiation triggered, TCEQ confirmed January 23, 2024
Clean Water Act- Section 404	Section 404(b)(1) Evaluation prepared found in Appendix F of 2016 report, Compliant	Compliance status the same as 2016 EA: No re-initiation triggered
Clean Air Act	A draft GCD prepared in appendix D of 2016 report	Bellow de minimis, Air Emission Inventory in Appendix D-3, Compliant
Endangered Species Act	No Effect determination, Compliant	BA Submitted January 22, 2024: In Progress
National Environmental Policy Act	FONSI signed June 2018, Compliant	In Progress
National Historic Preservation Act	SHPO Concurrence April 16, 2008	SHPO Concurrence May 11, 2022
EO 12898	Compliant	Compliant
EO 13985	NA (Singed January 20, 2021)	Compliant
EO14008	NA (Signed January 27, 2021)	Compliant
EO 13112	Compliant	Compliant
EO 11990	Compliant	Compliant
EO 11988	Compliant	Compliant

Three additional laws required additional review and coordination with the appropriate regulatory agency, as applicable, because the existing condition changed, the regulations were revised since 2016 or the Proposed Modified Plan would have impacts different than those described in the 2016 EA.

4.1 NATIONAL ENVIRONMENTAL POLICY ACT

This SEA has been prepared in accordance with CEQ regulations for implementing NEPA and discloses the environmental and social consequences of the No Action and Proposed Modified Plan. Based on this analysis and other pertinent information informing to the Proposed Modified Plan (e.g. DDR, engineering surveys, etc.), the alternative is not expected to have significant effects on the quality of the natural and human environment and preparation of an Environmental Impact Statement (EIS) is not warranted under the provisions of NEPA and other applicable regulations of the USACE. A Finding of No Significant Impact (FONSI) has been prepared to document this determination.

The 2016 EA relied on public involvement completed during the 2013 Galveston Harbor Channel Extension, Post-Authorization Change Report (PACR) Draft EA that was published 10 May 2013 for a 30-day public comment period that ended 10 June 2013. Comments received during that comment period were from Federal, State, and local agencies. Comments on the 2013 PACR Draft EA were used to evaluate impacts of alternatives and identify a plan that was socially and environmentally acceptable. No additional public involvement was coordinated during that period because it was determined that the GHCE was very limited in scope, non-controversial, and affects only a previously deepened and regularly maintained channel.

Because of the significant amount of time that has passed since the last time the public was able to comment on this project, this SEA will be circulated for a new public review period. The public review period was from January 22 through February 24. Comments from TPWD and EPA were received and can be found in appendix D-6. Additionally, each of the resource agencies have been updated on the status of the project including the proposed design modifications and were able to verbally provide concerns during the coordination meeting. Additional agency coordination efforts can be found in section 6.2 of the main report.

4.2 ENDANGERED SPECIES ACT

The ESA provides a program to conserve threatened and endangered plants and animals, and the habitats in which they are found. The Act requires Federal agencies to consult with the USFWS and NMFS, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of listed species or result in destruction or adverse modification of designated critical habitat of listed species. The Act also prohibits any action that causes an avoidable "taking" of any listed species of endangered fish or wildlife.

Compliance with the ESA (7 U.S.C. 136; 16 U.S.C. 460 et seq.) has been coordinated with the USFWS and the NMFS for those species under their respective jurisdictions. A draft supplemental BA covering the design changes associated with the Proposed Modified Plan was included with the public release of the EA. The USACE provided the supplemental BA to the USFWS and NMFS on January 22nd 2024 requesting the initiation of informal consultation with USFWS on potential impacts to the endangered West Indian manatee and with NMFS on potential impacts to the endangered loggerhead and Kemp’s Ridley sea turtles. ESA consultation is expected to be completed prior to the signing of the FONSI.

4.3 CLEAN AIR ACT

In accordance with the GCR promulgated under the Clean Air Act in 40 CFR Part 93 Subpart B, Determining Conformity of Federal Actions to State or Federal Implementation Plans (EPA 2010a), a Draft General Conformity Determination (GCD) will not be needed due to the emissions for NOx and VOC being below de minimis threshold values of 25 tons per year (tpy). Instead and Aim Emissions Inventory will be included in appendix D-3 to provide a detailed breakdown.

4.4 NATIONAL HISTORIC PRESERVATION ACT

Compliance with the National Historic Preservation Act of 1966, as amended (54 U.S.C. § 306108), requires the consideration of effects of the undertaking on all historic properties in the project area and development of mitigation measures for those adversely affected properties in coordination with the State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation. It has been determined that the modified plan will have no effect upon historic properties and no additional investigations are required. The Texas SHPO concurred with this determination on May 11, 2022 (Appendix D-4). If cultural resources are discovered during the course of construction, the USACE will cease all activities in the affected area and reinitiate consultation with the SHPO.

4.5 FISH AND WILDLIFE COORDINATION ACT

Planning Aid Letter (Appendix D-5) provided by USFWS in 2011 for the 2016 EA, the following agency recommendations were included for the district to consider while formulating plans for avoiding and minimizing impacts to fish and wildlife.

- Service recommends the beneficial use of dredge material over the upland confinement at Pelican Island. As identified in the Galveston Bay Habitat Conservation Blueprint, Sites, A Plan to restore the Habitats and Heritage of Galveston Bay (1998), both east and west shorelines and marshes of Pelican Island as well as the Pelican Spit (Little Pelican Island) have experienced significant erosion due to increased ship wakes and recent storm events.
    - Response: The USACE Considered the use of dredge material for beneficial use. However, the 2017 Feasibility Report determined that beneficial use of dredged material to construct an open water marsh was not the least cost placement which is required by policy. During PED, the costs and feasibility of using dredged material in a beneficial way was reassessed. To date, the costs for BU still remain higher than placing in Pelican Island and no cost-sharing sponsor has been identified that could offset the cost difference.
- While sea turtles are not expected to nest in the project area, they do feed in the bay system and may be encountered during dredging activities. Therefore, the National Oceanic and Atmospheric Administration, Protected Resource Division should be contacted for additional information on listed marine species under their jurisdiction.
    - Response: Concur, there are no feasible nesting sites located in the project area and avoidance measures are in place.
- No critical habitat for the piping plover is found within the project area, however; the birds can be located throughout the bay system on tidally exposed mud and sand flats.

The Service recommends that presence/absence surveys be conducted in suitable areas adjacent to Pelican Island and any necessary consultation procedures initiated with the Service pursuant to Section 7 of the Endangered Species Act to ensure that the birds are not inadve11ently disturbed or harassed.

- Response: Partially concur, there are no tidally exposed mud or sand flats in the project area. No presence or absence surveys needed.

4.6 EXECUTIVE ORDER 12898 – ENVIRONMENTAL JUSTICE

This EO directs Federal agencies to determine whether their programs, policies, and activities would have a disproportionately high or adverse effect on minority or low-income population groups within the Project Area to identify potential EJ issues. The proposed project would not have a disproportionate adverse impact on minority or low-income population groups within the project area (See section 3.7).

4.7 EXECUTIVE ORDER 13985 – ENVIRONMENTAL JUSTICE

This EO, dated January 20, 2021 acknowledges the increasing inequities attributable to the converging economic, health, and climate crises, and directs federal agencies to pursue a comprehensive approach to advancing equity for all.

4.8 EXECUTIVE ORDER 14008 – ENVIRONMENTAL JUSTICE

This EO focuses on tackling the Climate Crises at Home and Abroad, Section 219: Executive Order 14008, dated January 27, 2021, directs Federal agencies to take a Government-wide coordinated approach, coupled with substantive engagement by community stakeholders, to combat the climate crisis by reducing climate pollution in every sector of the economy; to increase resilience to the impacts of climate change; to protect public health; to conserve our lands, waters, and biodiversity; to deliver environmental justice to disadvantaged communities; and to spur well-paying union jobs and economic growth. Section 219 of this EO requires Federal agencies, among other things, to "[develop] programs, policies, and activities to address the disproportionately high and adverse human health, environmental, climate-related and other cumulative impacts on disadvantaged communities.

5.0 REFERENCES

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Appendix D-1 Engineering Templates

HGNC Galveston Channel Extension
Galveston, Galveston County, Texas
Draft Validation Report

March 2024

US Army Corps of Engineers
Galveston District

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Authorized Project and Modified Plan

Authorized Plan:

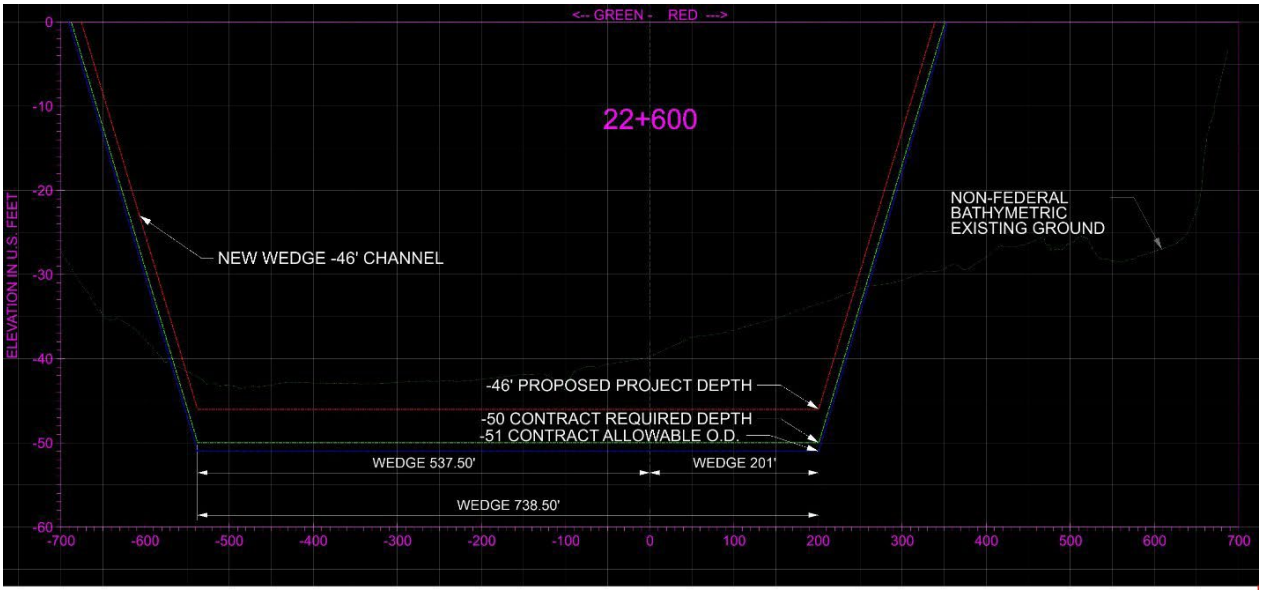
The proposed channel centerline alignment extends westward from Station 20+000 to the end of the existing 41-foot channel at Station 22+571. The channel would have side slopes of 1V:3H and a bottom width of 1,075 feet. The template depths were updated to Figure 1 and 2 based on the memo titled "District policy on setting dredging templates for studies, new work construction projects, and channel maintenance" dated April 2019. The memo is included in Attachment C and further explained below in "New Work Dredging".

Modified Plan:

The proposed channel centerline alignment would continue to extend from Station 20+000 to Station 23+076.27. The additional channel would also have the side slopes of 1V:3H with varying bottom widths from 744.45 feet to 384.50 feet. At the westerly limit of dredging for the additional channel there is an additional 150-foot end slope to facilitate dredging operations. The templates show 46-foot proposed project depth, 3-foot advanced maintenance, 1-foot additional over depth and 1-foot allowable overdepth.

See Figure 1 and 2 for the proposed channel cross sections.

1 Cross-Section Template Sample of Modified Plan



2 Cross-section Template Sample of Additional Channel

Modified Plan:

Information was received from Texas A&M at Galveston, located on the north side and at the west end of the proposed GHC Extension of their fishing dock so that the dredging safety envelope could be calculated. This is discussed more in Section 7 of appendix A.

Appendix D-2

Supplemental Biological Assessment

HGNC Galveston Channel Extension
Galveston, Galveston County, Texas
Draft Validation Report

July 2024

US Army Corps of Engineers
Galveston District

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Galveston Harbor Channel Extension Feasibility Study

Supplemental Biological Assessment

July 2024

Prepared by:

United States Army Corps of Engineers
Regional Planning and Environmental Center

US Army Corps of Engineers ®
Galveston District

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1.0 1 INTRODUCTION

This Supplemental Biological Assessment (BA) updates the evaluation of potential effects to the Federally listed threatened and endangered species potentially impacted form the Galveston Harbor Channel Extension Feasibility Study. Galveston County, Texas (GHCE) ; as required by Section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended. This information supplements the *USFWS Biological Assessment for the Galveston Harbor Channel Extension Feasibility Study, Galveston County, Texas* dated June 2022 and submitted under the administrative record for Consultation 2022-0034255. The intent of the Supplemental BA is not to replace the 2016 BAs, but to provide information on the changes influencing the consultation since the 2016 BAs were completed; hence it is not intended to be a stand-alone document. Unless otherwise stated herein, the elements of the proposed action remain unchanged from their description in the 2016 BAs. Likewise, the analysis of effects of the proposed modifications to the proposed action described in the Supplemental BA focuses on changes from the analysis of effects in the 2016 BAs.

This Supplemental BA demonstrates the proposed action, with proposed modifications, remains in compliance with Section 7 of the ESA, which assures that, through consultation with the US Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS; collectively referred to as the Services), Federal actions do not jeopardize the continued existence of any threatened, endangered or proposed species, or result in the destruction or adverse modification of critical habitat.

1.1. STUDY BACKGROUND

1.1.1. Purpose and Need

The GHCE is currently in the PED phase and the USACE team has prepared a Design Documentation Report (DDR) (USACE 2022) for this project. The DDR examines the design requirements for the channel deepening and has revised as needed based on the collection and analysis of data outlined in the DDRs, as well as taking into consideration of changed conditions. As a result, an adjustment was identified as being needed between Stations 22+571 to Station 23+076 to increase channel efficiency and maneuverability into the docks on the far western end of the channel.

The authorized RP design limits deeper draft vessels from calling at the most western docks in the channel. The design did not consider the turning needs for accessing the berthing areas, so vessels continue to be constrained by channel depth. If the GHCE RP were constructed as authorized, current light loading to access and depart these facilities would continue resulting in inefficient transportation practices and higher costs.

1.1.2. Scope of Study

The 2016 EA analyzed the recommended plan and the no action alternative. The scope of this Supplemental study is to identify and evaluate the environmental effects that could result from implementation of the proposed modification to the recommended plan. The proposed modification consist of an additional 505 feet and dredging it to the depth of -46 feet mean lower low water (MLLW) to match the previously authorized depth.

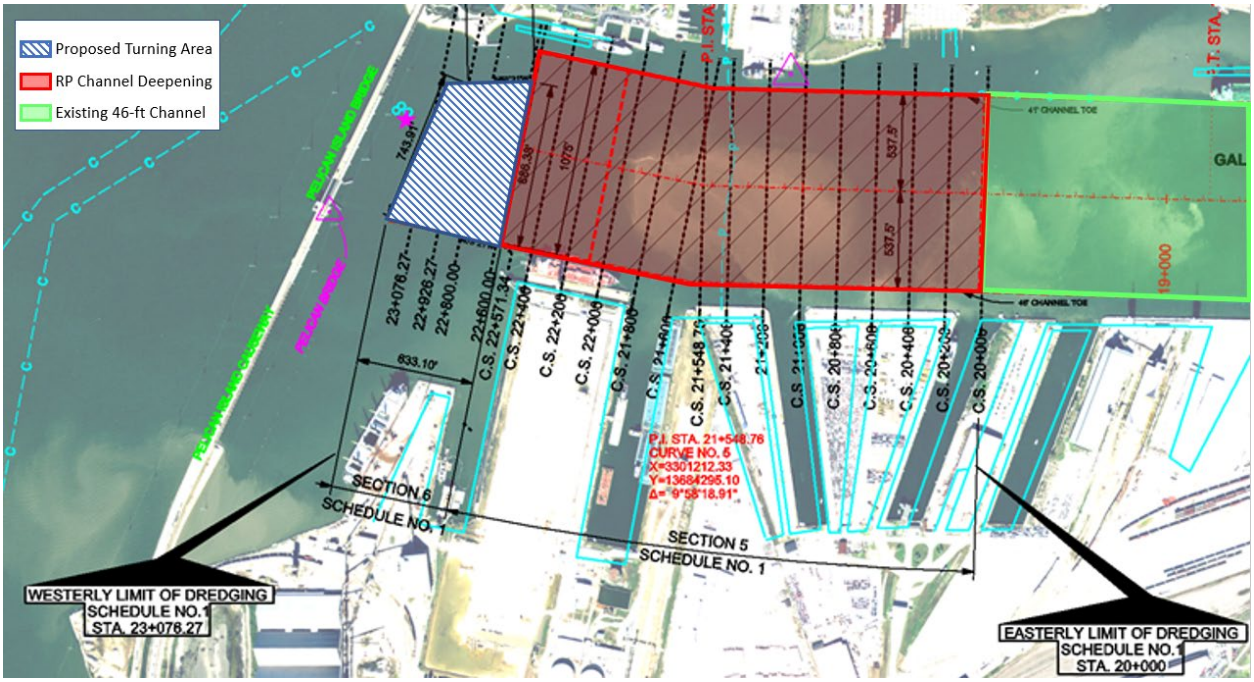

Figure 1 Proposed Additional Channel

1.2. CONSULTATION HISTORY

Previous coordination with the Services occurred during the development of the 2016 EA. A BA was submitted to USFWS on May 7, 2013 that concluded a No Effect Determination for all species as seen in Table 3. No response was received from the services.

2.0 DESCRIPTION OF THE PROPOSED MODIFICATIONS TO THE PROPOSED ACTION

This chapter describes the proposed action, a brief description of the potentially affected biological communities, and the potential adverse and beneficial impacts of the proposed action.

2.1. DESCRIPTION OF THE PROPOSED ACTION PRIOR TO MODIFICATIONS

consists of deepening the existing channel from -41 feet MLLW to -46 feet MLLW, plus three feet of advanced maintenance and two feet of allowable overdepth, such that the maximum channel depth following periodic maintenance will not exceed -50 feet MLLW. Deepening would begin near Port of Galveston (POG) Pier 38 at Station 20+000, continue westward towards Pelican Island Bridge and end at Station 22+571 (Figure 2) for approximately 2,571 feet. The RP does not include any channel widening, so the bottom width will remain at 1,075 feet or less and the channel top-of-cut will remain consistent with the template of the existing project. Figure 3 shows the channel template.

Channel deepening will be accomplished using a cutterhead, hydraulic pipeline dredge. The project will generate 600,500 cubic yards (cy) of new work material, consisting primarily of firm clays with low plasticity. The new work dredged material will be placed in the Pelican Island Placement Area (PA), a 1,100-acre upland site located approximately 1.25 miles north of the channel (Figure 4). Deepening the channel is not anticipated to change the frequency or quantity of material from the 41-foot-deep project. Maintenance dredging will still be required every four years and generate approximately 648,000 cy and could be placed in the Pelican Island PA, the Galveston Ocean Dredged Material Disposal Site (ODMDS), consistent with existing maintenance dredging.

The RP also involves mechanically raising the dikes at Pelican Island PA prior to deepening the channel to sufficient height to allow for the containment of the new work material and any initial maintenance material that may be encountered above the new work material during the channel deepening. No modification to the existing weir structures located at the northwest corner of Cell B or the drop-outlet structure located in Cell C would be needed as a result of the dike raising.

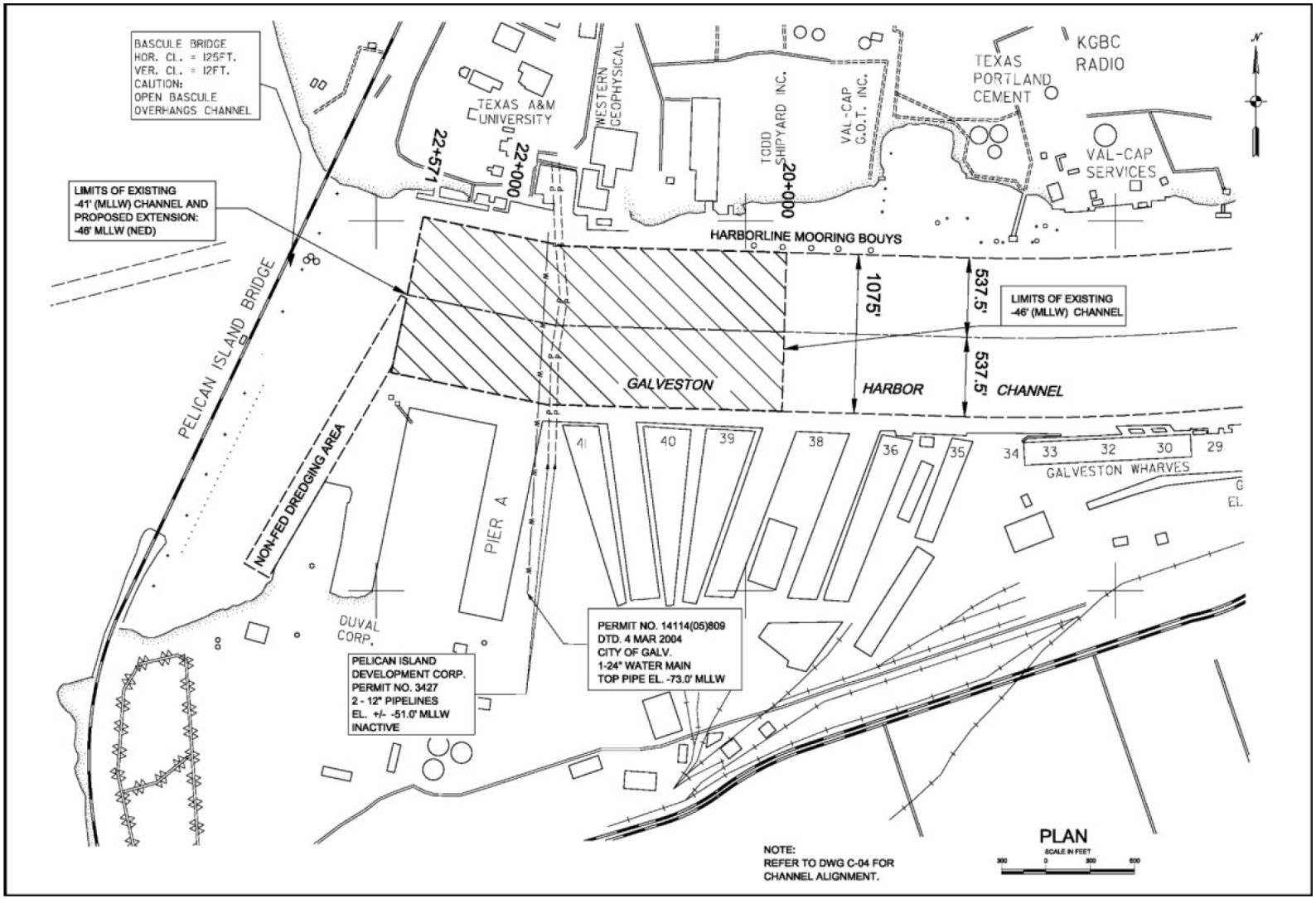

Figure 2 GHCE Channel Deepening Limits Pre-Modification

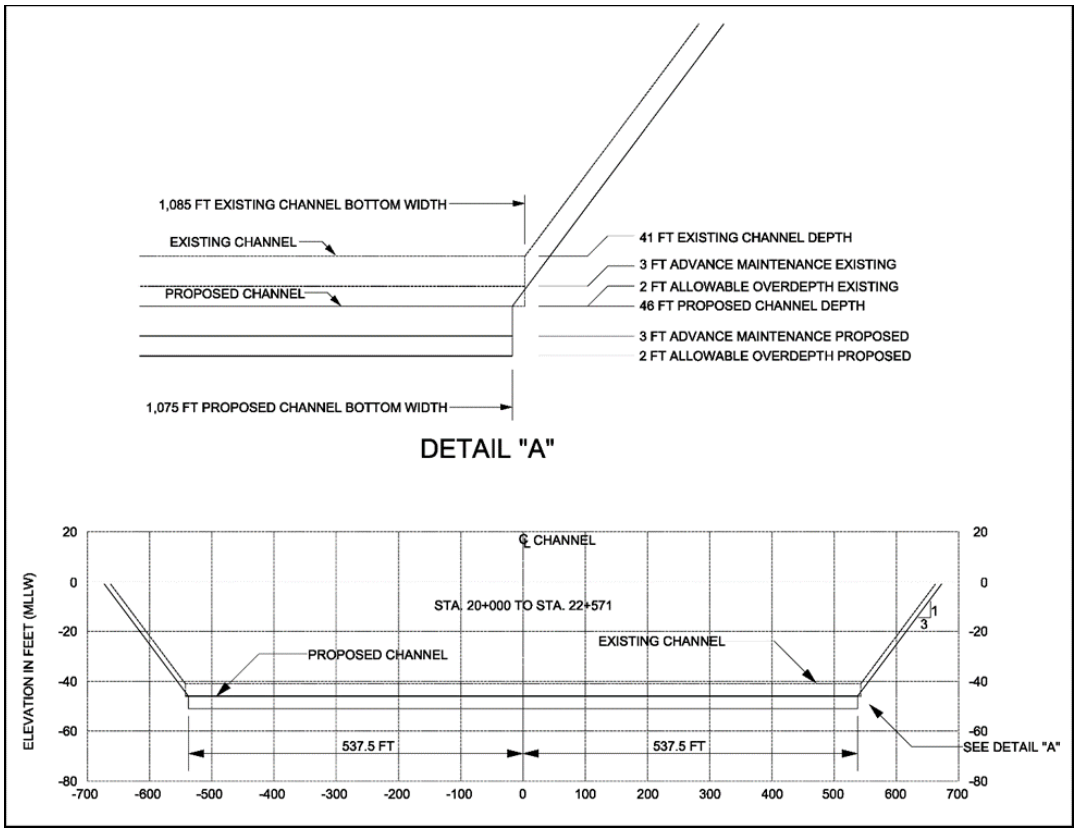

Figure 3 GHCE Pre-Modification Channel Template

Figure 4 GHCE Original Plan

2.2. MODIFICATION TO THE RECOMMENDED PLAN

Once the GHCE feasibility study phase concluded, the PED phase began with the design team and the Board of Trustees of the Galveston Wharves (the non-Federal sponsor for the project) working to refine the design of project elements. Proposed modifications were based on a concern raised by the NFS regarding maneuverability and access to berthing areas at the most western end of the channel. Other modifications were the result of more detailed information available or greater certainty of the information, such as the quantity of dredge material anticipated. As a result, the design was revised to resolve the concern and incorporate the new information.

To address the maneuverability and access concerns, additional channel was incorporated into the design between stations 22+571 and 23+076 (Figure 1). The additional channel would involve deepening an additional 505 feet of channel from the existing ground level to a depth of -46 feet, plus four feet of advanced maintenance and one foot of allowable overdepth (Figure 5). The channel bottom width would vary between 385 feet and 738.5 feet. A cutterhead, hydraulic pipeline dredge would be used to remove all material. The additional channel is expected to generate approximately 124,700 cy of new work material. New work and maintenance material would be placed into the Pelican Island PA. Construction of the additional channel is expected to add an estimated 14 days to the total construction

Other design modifications include:

- change in sediment quantities as a result of updated bathymetric surveys;
- change in channel template design that incorporates new policies regarding advanced maintenance and allowable overdepth (Figure 6).
- elimination of the Pelican Island PA dike raising.
    - The Pelican Island dike raising was removed from this project due to operations and maintenance taking over that portion of the project. Since the dike raising is no longer included, the effects determination for listed species are not included in this consultation. Additional information containing elevation surveys (Figure 7) and imagery of the PA was provided to USFWS showing the site is not suitable for Eastern Black Rail.

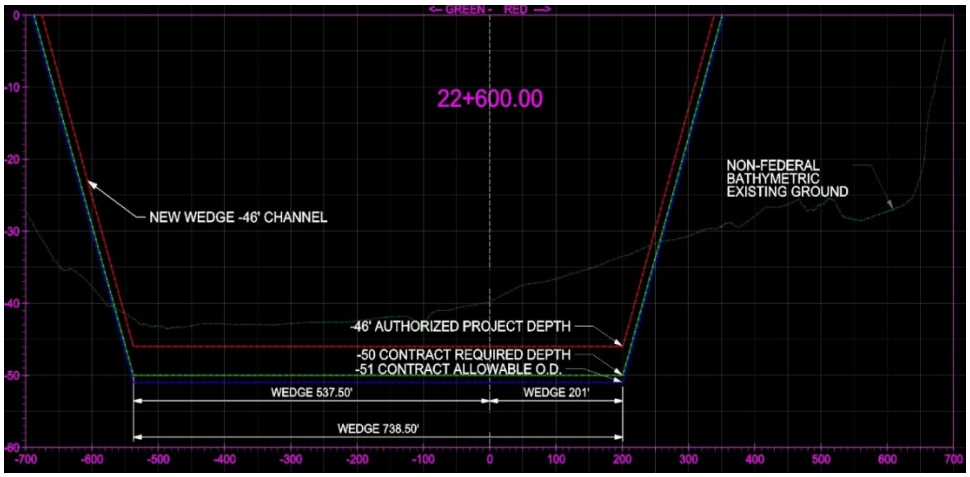

Figure 5 Proposed Additional Channel Template

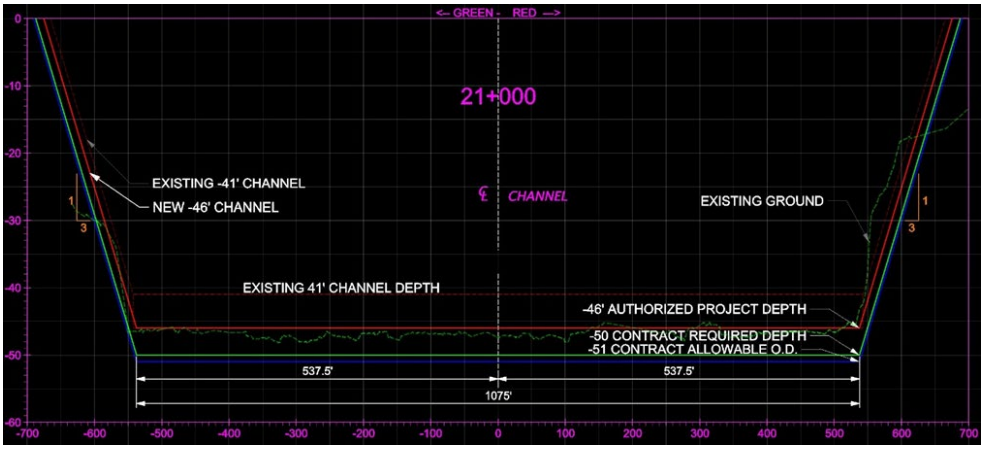

Figure 6 Refined Channel Template for Deepening Between Sta. 20+000 and 22+571

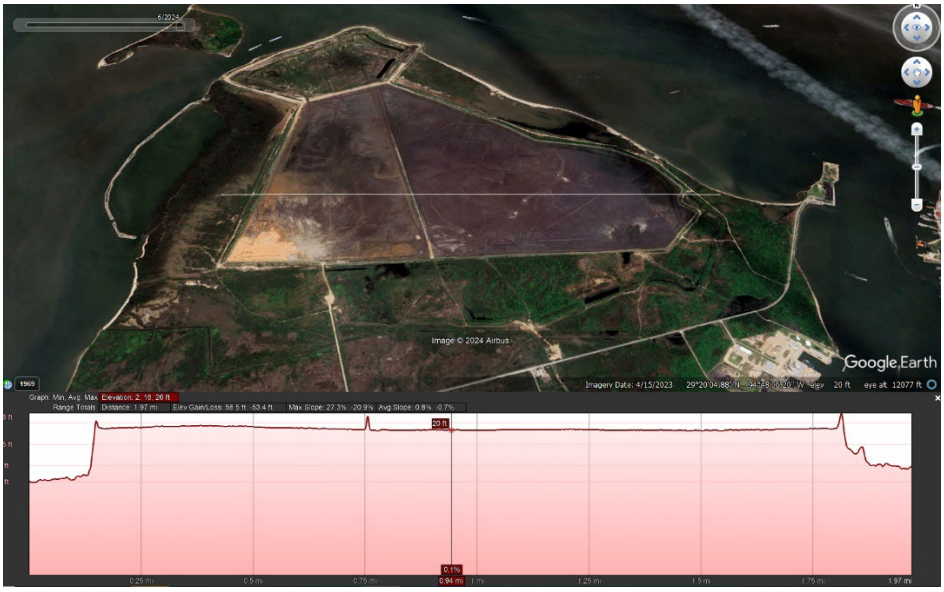

Figure 7 Pelican Island PA Elevation Survey

Table 1 Comparison of Pre and Post Modification

Change	***RP/No Action***	***Proposed Modified RP***	***± Change in Impact***
Channel Extension	*Deepen to -46 feet MLLW between Sta 20+000 and 22+571. The channel template extends a 1v:3h slope from elevation -46 with a vertical cut for 3 ft of advanced maintenance and an additional 2 ft for allowable overdepth. The design would generate 609,500 cy of new work dredge material.*	*No change in stationing; however, the channel template would extend the 1v:3h slope with a vertical cut for 4 ft of advanced maintenance and an additional 1 ft for allowable overdepth. The design would generate 457,400 cy of mew work dredged material.*	*-152,100 cy of new work material*
Additional Channel	*Not included in RP*	*Deepen 505 ft of channel to -46 ft between Sta. 22+571 and 23+076 with a varying bottom width. New work dredging would generate 143,100 cy of material to be placed at the Pelican Island PA.*	*+124,700 cy of new work material*
Pelican Island PA Modifications	*Mechanically raise the dike of cell B approximately 2 ft to an elevation of +30 ft with 1v:3h sides slopes and a crest width of approximately 10 ft wide.*	*Removed from project since dike raising is no longer necessary.*	*-1 month of construction noise, vibration, emission impacts*
Maintenance Dredging (Extension and Additional Channel)	*Every 4 years generating 648,000 cy of material*	*Every 4 years generating X cy of material*	*648,000 cy of material every 4 years*
Construction Duration *(Extension and Additional Channel)*	*~4 months, including 1 month to prepare the placement area and 3 months to construct the channel extension of which 62.5 days is dredging time.*	*~3 months, including 2.5 months to construct the channel extension and 0.5 month to construct the additional channel, of which 43 days is dredging time.*	*-1 month of total construction duration (-19.5 days of dredging time)*
Footprint *(Extension and Additional Channel)*	*81.8 acres*	*92.8 acres*	*+11 acres*

2.3. DESCRIPTION OF PROJECT AREA

The Galveston Channel Navigation Project is located on the upper Texas coast at the mouth of Galveston Bay in Galveston County, Texas. Galveston Channel is part of a complex of navigation channels running from offshore through Galveston Bay known as the Houston Galveston Navigation Channels (HGNC). Major channels include the Galveston Bay Entrance Channel from offshore, Bolivar Roads between Bolivar Peninsula and Galveston Island, the Houston Ship, Texas City, and Galveston Harbor Channels, and the Gulf Intracoastal Waterway. The Galveston Harbor Channel branches off the Galveston Bay Entrance Channel providing entry to the Port of Galveston. It extends in an east-west direction from Bolivar Roads between Galveston and Pelican Islands for about four miles. The project area includes the eastern end of Galveston Island and Pelican Island adjacent to the channel. Galveston Island is a low-lying barrier island two miles off the Texas coast, approximately 50 miles southeast of Houston, Texas.

2.3.1. Habitats

The project area is located in the Gulf Coast Prairies and Marshes Region that borders the Gulf of Mexico from the Sabine River to Corpus Christi Bay. The existing Galveston Harbor Channel reach and the Pelican Island disposal area are located in highly disturbed areas, associated with previous and ongoing maintenance and construction activities related to the existing authorized project. Seagrasses historically flourished in Galveston Bay, but seagrass beds have nearly disappeared entirely from the area due to human disturbances, hurricane activity, and their limited tolerances to turbidity, deep water, and wave energy. Oyster Reefs are also relevant in Galveston Bay, however, a survey conducted in the project area found no potential reefs.

Although the Pelican Island PA is an active confined upland PA, scattered terrestrial vegetation assemblages exist in the vicinity. Typical species include hackberry (*Celtis laevigata*), Bermuda grass (*Cynodon dactylon*), red mulberry (*Morus rubra L.*), palm trees (*Sabal Mexicana, S. texana*), and honey suckle (*Lonicera albiflora*). Invasive species such as Chinese tallow trees (*Sapium sabiferum*), Brazilian pepper (*Schinus terebinthifolius*), salt cedar (*Tamarisk sp.*), and giant reed (*Phragmites communis*) also occur in the vicinity of the PA. However, the current frequency of dredged material placement and related maintenance activities on Pelican Island PA deter the successful establishment and proliferation of these invasive species in the PA.

2.3.2. Wetlands

No wetlands or submerged aquatic vegetation occur within the existing footprint of Galveston Harbor Channel, which is a very active shipping lane that supports the POG and its numerous industrial and commercial activities. The Pelican Island PA is an existing active upland confined PA. As a result of the consistent periodic placement of maintenance dredged material into the PA as well as other maintenance activities associated with management of the PA, no persistent stands of wetlands or submerged aquatic vegetation occur within the cells of the PA. The immediate shoreline located outside of the channel footprint is highly developed with the Texas A&M University at Galveston (TAMUG) campus, commercial dock facilities, and the Pelican Island Bridge surrounding it to the north, south and west. Because of this extensive 30 commercial development, only a small remnant tidal salt marsh wetland occurs well outside the project footprint, along the northwestern edge of the project area between the Pelican Island Bridge and TAMUG. This small, approximately 4-acre wetland occurs behind a berm of shell

hash along the shoreline, but is connected to bay waters through a small tidal inlet channel. The wetland is dominated by saltmarsh cordgrass (*Spartina alterniflora*), saltmeadow cordgrass (*S. patens*), saltwort (*Batis maritima*), sea-ox eye daisy (*Borrichia frutescens*), big leaf sumpweed (*Iva frutescens*) and gulf cordgrass (*S. spartinae*).

3.0 ASSESSMENT OF LISTED SPECIES AND CRITICAL HABITAT IN THE ACTION AREA

Seventeen species listed as endangered, threatened, or candidate were identified and considered in the 2016 Biological Assessment (BA). Since then, six additional species have been identified as potentially occurring in the project area, while eight species are no longer identified as potentially occurring in the project area as indicated in the USFWS Official Species List, and/or on the most recent NMFS Texas' Threatened and Endangered Species List dated November 03, 2021.There is no designated critical habitat in the project area.

Of the 16 identified species, only the West Indian manatee, Kemp's ridley sea turtle, and loggerhead sea turtle have the potential to occur in the project area. The project area does not support habitat for the remaining 13 species and/or is outside the species known range. The shorelines along the GHC in the vicinity of the RP and Proposed Modified RP predominantly consist of bulkheads and dock facilities with only very small, short stretches of shorelines having shell hash substrates found at the TAMUG Clipper dock area. Additionally, one small wetland is found outside the 500-foot buffer of the project area.

To assess the status of species in the action area and potential impacts of the action on ESA-listed species, several sources were consulted including: literature review of scientific data; interview of recognized experts on listed species including local and regional authorities and Federal (USFWS and NMFS) and State (TPWD) wildlife personnel; on-site inspections; and compiled lists of ESA-listed species. Significant literature sources consulted include the USFWS and NMFS species specific webpages, Federal status reports and recovery plans, TPWD species occurrence and monitoring reports, peer-reviewed journals, and other standard references.

Table 2 ESA-listed Species Identified as Potentially Occurring in the Project Area

Species	***Agency***	***Status (2016)***	***Status (2022)***	***Habitat Needs***	***Occurrence In or Near the Project Area***
Birds					
Attwater's Greater Prairie-Chicken *Tympanuchus cupido attwateri*	*USFWS*	*E*	*E*	*Only known to occur in the wild at three locations. Prefer open prairies without any wood cover and avoid areas with more than 25% shrub cover. Knolls and ridges with minor variations in topography and soils resulting in a variety of vegetation types are characteristic of preferred habitat.*	*No – Outside known range*
Piping Plover *Charadrius melodus*	*USFWS*	*T*	*T*	*Wintering habitat broadly characterized as emergent tidal or washover areas that are unvegetated to sparsely vegetated with wet to saturated soils near water. Use coastal areas on the mainland and barrier islands, with bay side habitats (bayshore tidal sand and algal flats) serving as the primary habitat unless submerged, then they transition to oceanside beaches, washover passes, and mainland tidal mud flats.*	*No – No suitable habitat*
Rufa Red Knot *Calidris canutus rufa*	*USFWS*	*E*	*E*	*Migrating and wintering knots use sandy beaches, saltmarshes, lagoons, mudflats of estuaries and bays, and mangrove swamps that contain an abundance of invertebrate prey.*	*No – No suitable habitat*
Eastern Black Rail *Laterallus jamaicensis ssp. jamaicensis*	*USFWS*	*NR*	*T*	*Use tidally or non-tidally influenced wetlands ranging in salinity from salt to brackish to fresh. Require dense vegetation, moist soils, and areas of topographic change where molting birds can escape when areas are flooded.*	*No – No suitable habitat*
Whooping Crane *Grus americana*	*USFWS*	*NR*	*E*	*Winters along the Gulf Coast and breeds in Canada. On wintering grounds in Texas, they use estuarine marshes, shallow bays, and tidal flats, sometimes using nearby farms. Salt grass, saltwort, smooth cordgrass, glasswort, and sea oxeye dominate marshes, with Gulf cordgrass on the margins*	*No – No suitable habitat*
Fish					
Ocean whitetip shark *Carcharhinus longimanus*	*NMFS*	*NR*	*T*	*Pelagic, generally remaining offshore in the open ocean, on the outer continental shelf, or around oceanic islands in water depths greater than 184 m (~604 feet). They have a strong preference for the surface mixed layer in warm waters above 20°C (68°F).*	*No – Outside known range*
Giant manta ray *Manta birostris*	*NMFS*	*NR*	*T*	*Commonly found offshore, in oceanic waters and near productive coastlines. Can be found in cool water (>19°C). Observed using estuarine waters near oceanic inlets as nursery grounds. Closest known nursery to the Texas coast is >100 miles offshore at NOAA's Flower Garden Sanctuary.*	*No – Outside known range*

Species	Agency	Status (2016)	Status (2022)	Habitat Needs	Occurrence In or Near the Project Area
Insects					
Monarch Butterfly *Danaus plexippus*	*USFWS*	*NR*	*C*	*Mainly found in prairies, meadows, grasslands and along roadsides, across most of North America, where milkweed, their host plant, is prominent.*	*No – No suitable habitat*
Invertebrates					
Elkhorn coral *Acropora palmata*	*NMFS*	*T*	*NR*	--	--
Lobed star coral *Orbicella annularis*	*NMFS*	*T*	*NR*	--	--
Mountainous star coral *Orbicella faveolata*	*NMFS*	*T*	*NR*	--	--
Boulder star coral *Orbicella franski*	*NMFS*	*T*	*NR*	--	--
Mammals					
West Indian Manatee *Trichechus manatus*	*UFWS*	*E*	*E*	*Inhabit marine, brackish, and freshwater systems in coastal and riverine areas. Preferred habitat include areas near the shore featuring underwater vegetation like seagrass and eelgrass. They feed along grass bed margins with access to deep water channels, where they flee when threatened.*	*Yes –Records in the Bay*
Fin whale *Balaenoptera physalus*	*NMFS*	*E*	*NR*	--	--
Humpback whale *Megaptera novaengliae*	*NMFS*	*E*	*NR*	--	--

Species	Agency	Status (2016)	Status (2022)	Habitat Needs	Occurrence In or Near the Project Area
Sei whale *Balaenoptera borealis*	*NMFS*	*E*	*NR*	*--*	*--*
Sperm whale *Physeter macrocephalus*	*NMFS*	*E*	*E*	*Each of these whales can be found in the warmer waters of the Gulf of Mexico on the continental shelf edge and slope. They are usually observed in deeper waters of oceanic areas far from the coastline.*	*No – Outside known range*
Rice's Whale *Balaenoptera ricei*	*NMFS*	*NR*	*E*		*No – Outside known range*
Reptiles					
Green sea turtle *Chelonia mydas*	*USFWS* *NMFS*	*T*	*T*	*Primarily found in the Gulf of Mexico, and sub-adults occasionally found feeding in shallow bays and estuaries where marine sea grasses grow. Nest on beaches but nesting not recorded from the upper coast.*	*Yes – Records in the Bay*
Hawksbill sea turtle *Eretmochelys imbricata*	*USFWS* *NMFS*	*E*	*E*	*Prefer clear offshore waters of mainland and island shelves and are most common where coral reef formations are present. Nest on beaches but nesting not recorded from upper coast.*	*No – Outside known range*
Kemp's Ridley sea turtle *Lepidochelys kempii*	*USFWS* *NMFS*	*E*	*E*	*Migrates along the Texas coast and generally remains in near shore waters less than 165 feet deep to feed on shrimp, crab, and other invertebrates. Nest on beaches of Galveston Island.*	*Yes –Records in the Bay*
Leatherback sea turtle *Dermochelys coriacea*	*USFWS* *NMFS*	*E*	*E*	*Mainly pelagic, inhabiting the upper reaches of the ocean where deep water comes to the surface (upwelling areas). Nest on beaches but nesting not recorded from upper coast.*	*No – Outside known range*
Loggerhead sea turtle *Caretta caretta*	*USFWS* *NMFS*	*T*	*T*	*Prefer shallow inner continental shelf waters and occur only very infrequently in the bays and estuaries. Often occurs near offshore oil rig platforms, reefs, and jetties. Nests on open, sandy beaches. No nesting recorded from the upper coast.*	*Yes –Records in the Bay*

T= Threatened E= Endangered C= Candidate Species NR= Not on IPaC/Texas NMFS Report

3.1. WEST INDIAN MANATEE

Manatees are large, elongated marine mammals with paired flippers and a large, spoon-shaped tail. They can reach lengths of over 14 feet and weights of over 3,000 pounds. Manatees are herbivores thatfeed opportunistically on a wide variety of submerged, floating, and emergent vegetation.

3.1.1. Species Description

USFWS listed the West Indian manatee as endangered on March 11, 1967 (32 FR 4001) and later received protection under ESA in 1973. On May 5, 2017, the species was reclassified from endangered tothreatened because the endangered designation no longer reflected the status of the species at the time of reclassification (82 FR 16668). Critical habitat for the Florida manatee subspecies (*Trichechus manatus latirostris*) was designated in 1976 (41 FR 41914).

The major threats faced by manatees today are numerous. Collisions with watercraft account for an average of 24-30% of the known manatee deaths in Florida annually. Deaths attributed to water control structures and navigational locks represent four percent of known deaths. There are also threats to theirhabitat as a result of intensive coastal development throughout much of the manatee's range. As well, the availability of warm-water refuges for manatee is uncertain if minimum flows and levels are not established for the natural springs on which many manatees depend and as deregulation of the power industry in Florida occurs. There are also threats from natural events such as red tide and cold events. (USFWS 2001b).

3.1.1.1. Range and Habitat

The West Indian manatee was historically found in shallow coastal waters, bays, lagoons, estuaries, rivers, and inland lakes throughout much of the tropical and sub-tropical regions of the New World Atlantic, including many of the Caribbean islands. However, at the present time, manatees are now rareor extinct in most parts of their former range. Today, manatees occur primarily in Florida and southeastern Georgia, but individuals can range as far north as Rhode Island on the Atlantic coast (Reid 1996) and as far west as Texas on the Gulf coast.

Manatees live in marine, brackish, and freshwater systems in coastal and riverine areas throughout theirrange. Preferred habitats include areas near the shore featuring underwater vegetation like seagrass and eelgrass. They feed along grass bed margins with access to deep water channels, where they flee when threatened. Manatees often use secluded canals, creeks, embayments, and lagoons, particularly near the mouths of coastal rivers and sloughs, for feeding, resting, cavorting, mating, and calving (Marine Mammal Commission 1986). In estuarine and brackish areas, natural and artificial fresh water sources are sought by manatees.

When ambient water temperatures drop below 68 degrees Fahrenheit in autumn and winter, manateesaggregate within the confines of natural and artificial warm-water refuges or move to the southern tip of Florida (Snow 1991). Most artificial refuges are created by warm-water outfalls from power plants or paper mills. The largest winter aggregations are at refuges in Central and Southern Florida. The northernmost natural warm-water refuge used regularly on the west coast is at Crystal River and at BlueSprings in the St. Johns River on the east coast. Most manatees return to the same warm-water refuges each year; however, some use different refuges in different years and others use two or more refuges inthe same winter (Reid and Rathbun 1986, Reid et al. 1995). Many lesser known, minor aggregation sites are used as

temporary thermal refuges. Most of these refuges are canals or boat basins where warmerwater temperatures persist as temperatures in adjacent bays and rivers decline.

As water temperatures rise manatees disperse from winter aggregation areas. While some remain near their winter refuges, others undertake extensive travels along the coast and far up rivers and canals. While uncommon, manatees occasionally occur along the coast of Texas.

During the summer, manatees may be commonly found almost anywhere in Florida where water depthsand access channels are greater than one to two meters (O'Shea 1988). Manatees can be found in very shallow water. In warm seasons, they usually occur alone or in pairs, although interacting groups of five to ten animals are not unusual.

3.1.1.2. Occurrence in the Action Area

The West Indian manatee historically inhabited the Laguna Madre, the Gulf, and tidally influenced portions of rivers. It is currently, however, uncommon in Texas waters and the most recent sightings in Galveston Bay are likely individuals migrating or wandering from Mexican waters. Sightings along the Texas coast have been increasing in the recent years with at least one individual sighted each year. Near the project area, the most recent sighting occurred in the Galveston Ship Channel in 2023.

Despite the number of occurrences increasing, the species continues to be rare in the action area and its presence is unlikely; however, with it cannot be ruled out with certainty that the species could not occur in the action area during construction.

3.1.2. Effects on the Species and Habitat

Due to the rarity of the manatee and implementation of the conservation measures, the proposed action ***may affect, but not adversely affect*** the West Indian manatee.

In the rare instance that a manatee is found in or near any of the action areas, operation of equipment and vessels involved in the dredging operations and movement of dredged material or equipment could adversely impact manatees. Impacts could include temporary habitat avoidance, exposure to underwater sound, and visual disturbances, which would all cease after construction is complete. The most extreme impact could include entrapment and/or collision with pipes, silt barriers, equipment, support vessels or other in-water construction equipment. Although this is unlikely due to the rare occurrence of West Indian manatee in the action area, avoidance and minimization measures are being incorporated into the plan to avoid harassment and take of manatee and include actions such as having a biological monitor constantly observing the construction zone for manatee presence and stopping working if an individual is observed within 50 feet of the active construction zone. Additionally, vessels will be required to move at slow speeds and any potential barriers in the water will be constructed to avoid entanglement. See section 4.2 for complete list of avoidance and minimization measures.

3.2. KEMP'S RIDLEY SEA TURTLE

3.2.1. Species Description

The Kemp's ridley sea turtle is the smallest of the sea turtles, with adults reaching about 2 feet in length and weighing up to 100 pounds. The species has a triangular-shaped head and a slightly hooked beak with large crushing surfaces. The turtle's diet consists mainly of swimming

crabs, but may also include fish, jellyfish, sea stars, snails, bivalves, shrimp, sea urchins, an array of mollusks, and occasional marine plants (NMFS et al. 2011).

3.2.1.1. Range and Habitat

Kemp's ridleys inhabit shallow coastal and estuarine waters, usually over sand or mud bottoms. Models indicate that the most suitable habitats are less than 32 feet in bottom depth with sea surface temperatures between 71.6°F and 89.6°F (Coyne et al. 2000). Kemp's ridleys utilize seagrass beds, mud bottom, and live bottom substrates as important developmental habitats (Schmid and Barichivich 2006). Post-nesting Kemp's ridleys travel along coastal corridors that are generally shallower than 164 feet in bottom depth (Schmid and Barichivich 2006). Females lay their eggs on coastal beaches where they incubate eggs in sandy nests.

After embryonic development, the hatchlings emerge and swim offshore into deeper, ocean water where they feed and grow until returning at a larger size to nearshore coastal habitats. This life history is characterized by three basic ecosystem zones: (1) terrestrial zone (supralittoral) – the nesting beach where both oviposition and embryonic development occur; (2) neritic zone – the nearshore (including bays and sounds) marine environment (from the surface to the sea floor) where water depths do not exceed 200 meters, including the continental shelf; and (3) oceanic zone – the vast open ocean environment (from the surface to the sea floor) where water depths are greater than 650 feet (200 meters) (NMFS et al. 2011).

Kemp's ridleys nest on beaches from April to July. Nesting is essentially limited to the beaches of the western Gulf of Mexico, primarily in Tamaulipas, Mexico. Nesting also occurs in Veracruz and a few historical records exist for Campeche, Mexico (Marquez 1994). Nesting also regularly occurs in Texas and infrequently in a few other U.S. states. However, historic nesting records in the U.S. are limited to south Texas (Hildebrand 1963). Several scatted isolated nesting attempts have occurred from North Carolina to Colombia.

Kemp's ridley occurs in Texas in small numbers and in many cases may well be in transit between crustacean-rich feeding areas in the northern Gulf of Mexico and breeding grounds in Mexico. It has nested sporadically in Texas over the last 50 years. The number of nests has increased over the last couple of decades (NPS 2013; TIRN 2022). The majority of Kemp's ridley nests recorded in Texas were at the Padre Island National Seashore (Shaver 2006).

3.2.1.2. Occurrence in the Action Area

Texas coasts are important foraging and inter-nesting habitats for the species. Satellite-tracking indicated that nesting Kemp's ridley turtles remain in near-shore waters of the upper Texas coast during their 3.5 month-long nesting season (April through mid-July; Seney and Landry 2008). The majority of Kemp's ridley nesting occurs along Padre Island; however, the turtles consistently nested at Bolivar Peninsula or Galveston Island since 2019, with an area record of five on Galveston Island in 2017 and five on Bolivar Peninsula in 2015 (TIRN 2022).

Of all the sea turtles potentially present within the study area, Kemp's ridley has the highest potential for occurrence based on habitat requirements, nesting records, and research. Given the habitat in the study is a consistent of the Galveston Ship Channel and Pelican Island PA, it is improbable that this species would be found nesting, because of the lack of suitable nesting habitat. However, Kemp's ridley turtles may forage, rest, or move in and near the study, throughout the access channels and in the open waters of the Gulf of Mexico or surrounding estuaries.

It is highly unlikely Kemp's ridley would nest within the study area, but they could occur in the study area while foraging, transiting, or resting.

3.2.2. Effects on the Species and Habitat

New work and maintenance dredging for the proposed project would be conducted using hydraulic cutterhead and clamshell dredges, which move at sufficiently slow speeds that turtles would be able to avoid the cutterhead or clamshell bucket. Additionally, a Regional Biological Opinion (RBO), dated November 19, 2003, by the NMFS for the Galveston, New Orleans, Mobile, and Jacksonville Districts of the USACE concluded that non-hopper dredges are not known to take sea turtles. A hydraulic cutterhead dredge and the clamshell dredge are non-hopper type of dredge.

Avoidance of use of transient forage habitat in the Bay by sea turtles due to dredging noise and light would be the same impact as currently occurs during periodic maintenance dredging. However, plenty of directly adjacent habitat would be available during the temporary construction dredging. Given the transient use and the temporary nature of the construction (~3 months), occurrence of the effect would be unlikely but possible.

Additionally, there is no suitable nesting habit in or near the GHCE project area or in the existing upland disposal site.

Implementation of the Proposed Modified RP ***may affect, but is not likely to adversely affect*** Kemp's ridley sea turtles, especially with the conservation measures that would be implemented.

3.3. LOGGERHEAD SEA TURTLE

3.3.1. Species Description

The loggerhead sea turtle is a medium to large turtle. Adults are reddish-brown in color and generally 31 to 45 inches in shell length with the record set at more than 48 inches. Loggerheads weigh between 170 and 350 pounds with records set at greater than 500 pounds. Loggerhead turtles are essentially carnivores, feeding primarily on sea urchins, sponges, squid, basket stars, crabs, horseshoe crabs, shrimp, and a variety of mollusks. Adults are predominantly bottom feeders, although they will also eat jellyfish and mangrove leaves obtained while swimming and resting near the sea surface. Presence of fish species, such as croaker in stomachs of stranded individuals may indicate feeding on the by-catch of shrimp trawling (Landry 1986). Young feed on prey concentrated at the surface, such as gastropods, fragments of crustaceans, and sargassum.

3.3.1.1. Range and Habitat

Loggerhead sea turtles occur throughout the temperate and tropical regions of the Atlantic from Nova Scotia to Argentina, Gulf of Mexico, Pacific and Indian oceans (although it is rare in eastern and central Pacific), and the Mediterranean (Iverson 1986). This species may be found hundreds of miles out to sea, as well as in inshore areas such as bays, lagoons, salt marshes, creeks, and the mouths of large rivers. Loggerhead sea turtles are considered turtles of shallow water.

Juvenile loggerheads are thought to utilize bays and estuaries for feeding, while adults prefer water less than 165 feet deep (Nelson 1986). Adults occupy various habitats from turbid bays to

clear waters of coral reefs. Sub-adults occur mainly in nearshore and estuarine waters, while hatchlings move directly to the sea after hatching, and often float in masses of sargassum. They remain associated with sargassum for as long as 3 to 5 years (NFMS and USFWS 1991a).

In the continental U.S., loggerheads nest along the Atlantic coast from Florida to as far north as New Jersey (Musick 1979) and sporadically along the Gulf Coast. In recent years, a few have nested on barrier islands along the Texas coast. Nesting usually occurs on open sandy beaches above the high-tide mark and seaward of well-developed dunes. They nest primarily on high-energy beaches on barrier islands adjacent to continental land masses in warm-temperate and subtropical regions. Steeply sloped beaches with gradually sloped offshore approaches are favored. In Florida, nesting on urban beaches was strongly correlated with the presence of tall objects (trees or buildings), which apparently shield the beach from city lights (Salmon et al. 1995).

3.3.1.2. Occurrence in the Action Area

The loggerhead is the most abundant turtle in Texas marine waters, preferring shallow inner continental shelf waters, and occurring only very infrequently in the bays. It often occurs near offshore oil rig platforms, reefs, and jetties. Loggerheads are probably present year-round but are most noticeable in the spring when a favored food item, the Portuguese man-of-war (*Physalia physalis*), is abundant. Loggerheads constitute a major portion of the dead or moribund turtles washed ashore (stranded) on the Texas coast each year.

Several nests have been recorded along the Texas coast; however, nesting is uncommon. Between 2014 and 2022 between 0 and 9 nests were recorded each year on the Texas Coast, with the closest occurring on Surfside Beach (~ 90 miles south) in 2017, 2020, and 2022 (TIRN 2022).

The study area will not support nesting loggerhead sea turtles because of the lack of suitable habitat; however, this species could be present in the Gulf of Mexico or access channels during foraging and transiting activities.

3.3.2. Effects on the Species and Habitat

The impacts anticipated for Loggerhead Sea turtles are identical for the Kemps Ridley Sea turtle. Implementation of the Proposed Modified RP ***may affect, but is not likely to adversely affect*** these sea turtle species, especially with the conservation measures that would be implemented.

3.4. GREEN SEA TURTLE

3.4.1. Species Description

Green turtles are the largest of all the hard-shelled sea turtles but have a comparatively small head. Adults are unique among sea turtles in that they are herbivorous, feeding primarily on seagrasses and algae. While juveniles consume some invertebrates including mollusks and crustaceans, they are also known to feed on sponges, jellyfish, seagrasses, macroalgae, and other marine plants (Mortimer 1982).

3.4.1.1. Range and Habitat

The green sea turtle is a circumglobal species in tropical and subtropical waters. In the U.S., it occurs in Atlantic waters around the U.S. Virgin Islands, Puerto Rico, and continental U.S. from

Massachusetts to Texas. Major nesting activity occurs on Ascension Island, Aves Island (Venezuela), Costa Rica, and in Suriname. Relatively small numbers nest in Florida, with even smaller numbers in Georgia, North Carolina, and Texas (NFMS and USFWS 1991b; Hirth 1997).

The green turtle primarily utilized shallow habitats such as lagoons, bays, inlets, shoals, estuaries, and other areas with an abundance of marine algae and seagrasses. Hatchlings often float in masses of sea plants (e.g., rafts of sargassum) in convergence zones. Coral reefs and rocky outcrops near feeding pastures often are used as resting areas. Terrestrial habitat is typically limited to nesting activities (Balazs 1980) that occur during the summer from June to September. They prefer high energy beaches with deep sand, which may be coarse to fine, with little organic content. Most green sea turtles' nest in Florida and in Mexico, while nests in Texas are rare (Shaver and Amos 1988). More recently, green turtle nests were documented in Texas, of which all but one was from Padre Island National Seashore. In 2012, six green turtle nests were reported from Padres Island National Seashore and two from South Padre Island.

3.4.1.2. Occurrence in the Action Area

While green sea turtles occasionally occur along the Texas coast and juveniles can be found in inshore waters, they are more frequently observed along the South Texas coast around South Padre Island and Padre Island National Seashore, approximately 190 miles west of the project area. No green sea turtle nests have been recorded from Galveston Island (TIRN 2022). In 2014, juvenile green turtles were found on Galveston Island beaches during heavy seaweed landings (Park Board, 2014). Green sea turtles could nest on Galveston Island; however, none were reported in 2014-2021, and as of August 2022, none have been reported on Galveston Island (TIRN 2022).

3.4.2. Effects on the Species and Habitat

The impacts anticipated for Green sea turtles are identical for the Kemps Ridley Sea turtle. Implementation of the Proposed Modified RP ***may affect, but is not likely to adversely affect*** these sea turtle species, especially with the conservation measures that would be implemented.
Avoidance and Minimization Measures

3.5. GENERAL CONSERVATION MEASURES

The following conservation measures would be incorporated into operations for the protection of all listed species:

- All personnel (contractors, workers, etc.) will attend training sessions prior to the initiation of, or their participation in, project work activities. Training will include: 1) recognition of West Indian manatee, Kemps Ridley sea turtle, Loggerhead sea turtle, and their habitat, and signs; 2) impact avoidance measures; 3) reporting criteria; 4) contact information for rescue agencies in the area; and 5) penalties of violating the ESA.
- Project equipment and vehicles transiting between the staging area and restoration site will be minimized to the extent practicable, including but not limited to using designated routes and confining vehicle access to the immediate needs of the project.

- The contractor will coordinate and sequence work to minimize the frequency and density of vehicular traffic within and near the restoration unit(s) and limit driving to the greatest extent practicable.
- Use of construction lighting at night shall be minimized, directed toward the construction activity area, and shielded from view outside of the project area to the maximum extent practicable.
- A designated monitor(s) will be identified who will act as the single point of contact responsible for communicating and reporting endangered species issues throughout the construction period.

3.6. WEST INDIAN MANATEE

The following conservation measures would be implemented to minimize the potential for adverse effects to manatees:

- The Federal Action Agency shall ensure the Resident Engineers (RE) and/or a biological monitor are trained on manatee identification and behaviors. The RE/biological monitor will have stop work authority and will monitor for the presence of manatee(s) during any project phase involving open water work. All on-site project personnel are responsible for observing water-related activities for the presence of manatee(s) and notifying the RE/biological monitor, if spotted. The RE and/or biological monitor would be onsite during any construction activities for the entire project period.
- Training will include but is not limited to manatee training materials and videos found at https://www.youtube.com/watch?v=Xs7zLRtZVOQ and Manatee and Other Marine Animal Watch Information | FWC (myfwc.com).
- Before activities occur in open water areas, a 50-foot radius of the work area should be delineated. If a manatee(s) is observed within the 50-foot radius, the RE/biological monitor shall halt all in-water operations, including vessels. Activities shall not resume until the manatee(s) has moved beyond the 50-foot radius of the project operation, or until 30 minutes' elapses if the manatee(s) has not reappeared within 50 feet of the operation. Animals must not be herded away or harassed into leaving. If a manatee is sighted within 100 yards of the active work zone, vessels will operate at no wake/idle speeds.
- All personnel associated with the project shall be instructed daily about the presence of manatees, manatee speed zones, and the need to avoid collisions with and injury to manatees.
- All vessels associated with the construction project shall operate at "Idle Speed/No Wake" at all times while in the immediate area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.
- Temporary signs concerning manatees shall be posted prior to and during all in- water project activities. All signs are to be removed by the permittee upon completion of the project.

- Temporary signs should be place in a manner visible to construction crews and the size should be minimum of 12 inches by 15 inches and individual letter size a minimum of 2 inches. These types of signs must be posted: One sign which reads “CAUTION BOATERS: MANATEE AREA”, a second sign explaining the requirements for "IDLE SPEED/NO WAKE" and a third sign explaining the shutdown requirements by stating “CAUTION: MANATEE AREA/ EQUIPMENT MUST BE SHUTDOWN IMMEDIATELY IF A MANATEE COMES WITHIN 50 FEET OF OPERATION”. Several signs should be placed throughout the project area depending upon the size of the construction work zone.
- Siltation or turbidity barriers shall be made of material in which manatees cannot become entangled, shall be properly secured, and shall be regularly monitored throughout the day to avoid manatee entanglement or entrapment.
- Any manatee sightings, collision with, or injury to a manatee shall be reported immediately to the Texas Marine Mammal Stranding Network Hotline at 1-800-9- MAMMAL and the Texas Coastal Ecological Service Field Office at 281-286-8282, extension 26504. Please provide the nature of the call (i.e., report of an incident, manatee sighting, etc.); time of incident/ sighting; and the approximate location, including the latitude and longitude coordinates, if possible.

4.0 CONCLUSION

This Supplemental BA updates the conclusions presented regarding the potential effects of implementing the HSC ECIP. It accounts for modifications to several project elements not originally described in the 2016 BA and incorporates new available information

Based upon the findings of this supplemental BA, USACE has determined that the effects determination have not changed for any species previously considered in the 2016 BA and for which concurrence was provided. Table 3 provides a summary of the effects determination from the 2016 BA and this Supplemental BA.

Table 3 Effects Determination For ESA-listed Species

Species	Agency	Status (2016)	Effect Determination (2016)	Status (2022)	Effect Determination (2022)
Birds					
Attwater's Greater Prairie-Chicken	USFWS	E	No effect	E	No effect
Piping Plover	USFWS	T	No effect	T	No effect
Rufa Red Knot	USFWS	E	No effect	E	No effect
Eastern black rail	USFWS	NR	--	T	No Effect
Whooping Crane	USFWS	NR	--	E	No Effect
Fish					
Ocean whitetip shark	NMFS	NR	--	T	No effect
Giant manta ray	NMFS	NR	--	T	No effect
Insects					
Monarch Butterfly	USFWS	NR	--	C	No effect
Invertebrates					
Elkhorn coral	NMFS	T	No effect	NR	--
Lobed star coral	NMFS	T	No effect	NR	--
Mountainous star coral	NMFS	T	No effect	NR	--
Boulder star coral	NMFS	T	No effect	NR	--
Mammals					
West Indian manatee	USFWS	E	No effect	E	NLAA
Fin whale	NMFS	E	No effect	NR	--

Species	Agency	Status (2016)	Effect Determination (2016)	Status (2022)	Effect Determination (2022)
Humpback whale	NMFS	E	No effect	NR	--
Sei whale	NMFS	E	No effect	NR	--
Sperm whale	NFMS	E	No effect	E	No effect
Rice's Whale	NMFS	NR	--	E	No effect
Reptiles—In Water					
Green sea turtle	NMFS	T	No effect	T	NLAA
Hawksbill sea turtle	NMFS	E	No effect	E	No effect
Kemp's Ridley sea turtle	NMFS	E	No effect	E	NLAA
Leatherback sea turtle	NMFS	E	No effect	E	No effect
Loggerhead sea turtle	NMFS	T	No effect	T	NLAA
Reptiles – On Land					
Green sea turtle	NMFS	T	No effect	T	No effect
Hawksbill sea turtle	NMFS	E	No effect	E	No effect
Kemp's Ridley sea turtle	NMFS	E	No effect	E	No effect
Leatherback sea turtle	NMFS	E	No effect	E	No effect
Loggerhead sea turtle	NMFS	T	No effect	T	No effect

NLAA = Not likely to adversely affect

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Appendix D-3 Air Emission Inventory

HGNC Galveston Channel Extension
Galveston, Galveston County, Texas
Draft Validation Report

March 2024

US Army Corps of Engineers
Galveston District

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AIR EMISSIONS INVENTORY
GALVESTON HARBOR CHANNEL EXTENSION
POST-AUTHORIZATION CHANGE REPORT
GALVESTON COUNTY, TEXAS

Prepared by:
U.S. Army Corps of Engineers
Regional Planning and Environmental Center
2000 Fort Point Rd
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Annex A

Acronyms and Abbreviations

CAA	Federal Clean Air Act
CFR	Code of Federal Regulations
CO	carbon monoxide
CY	cubic yards
DEIS	Draft Environmental Impact Statement
DOT	U.S. Department of Transportation
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
FHWA	Federal Highway Administration
GHC	Galveston Harbor Channel
GHCE	Galveston Harbor Channel Extension
GRP	General Re-evaluation Plan
HGB	Houston/Galveston/Brazoria
MPO	Metropolitan Planning Organization
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NO_x	nitrogen oxides
PM_{10}	particulate matter with an aerodynamic diameter equal to or less than 10 microns
PACR	Post Authorization Change Report
AP	Authorized Plan
SEA	Supplemental Environmental Assessment
SIP	Texas State Implementation Plan
SO_2	sulfur oxides
TCEQ	Texas Commission on Environmental Quality
tpd	tons per day
tpy	tons per year
U.S.	United States
USACE	U.S. Army Corps of Engineers
VOC	volatile organic compound

1.0 INTRODUCTION

The Galveston Harbor Channel (GHC) is located on the upper Texas coast at the mouth of Galveston Bay in Galveston County, Texas. The approximately four-mile-long GHC is included in the Offshore Reach (the common Entrance Channel) of the Houston-Galveston Navigation Channels, Texas, Project and provides entry to the Port of Galveston, Texas. The GHC extends in an east-west direction from Bolivar Roads between Galveston and Pelican Islands (**Figure 1**). In 2016, the USACE signed a FONSI and published a Final EA for the recommended plan (RP) authorized by Congress. The Galveston Harbor Channel Extension (GHCE) Project was approved in 2017 to extend the depth to 46 feet below mean lower low water for 2,571 feet of the channel length and the project moved into the pre-construction, engineering, and design (PED) phase. This channel improvement would increase navigation efficiency from deep draft vessels enabling maximum loading and would allow users at the far end of Galveston Harbor Channel to take advantage of fully loaded vessels alleviating the current practices of light-loading. The project sponsor is the Galveston Wharves.

During PED, the design team identified revisions to the recommended plan (RP), one which incorporated an additional 505 feet of channel to the authorized project at the most western end of the GHC (Figure 2). In addition, updated geotechnical surveys determined that the amount of sediment that needs to be dredged is less than projected, so that a net decrease in sediment dredged and a shorter construction duration (about one month) has resulted. The project will incorporate advanced maintenance dredging as a part of the same contract. While this increases the amount of material to be dredged, the capacity of the proposed placement area at Pelican Island has been determined to be adequate and no work will be conducted at the placement area. The U.S. Army Corps of Engineers (USACE) has prepared this emissions inventory to describe the environmental impacts of air emissions associated with the revisions to the RP, subsequent to the published Final EA for the RP authorized by Congress in 2017.

This project, as a Federal action, is subject to the General Conformity Rule promulgated by the U.S. Environmental Protection Agency (EPA) pursuant to the Clean Air Act (CAA), Section 176(c)(1). The rule mandates that the Federal government does not engage in, support, or provide financial assistance for licensing or permitting, or approving any activity not conforming to an approved state implementation plan. In Texas, the applicable plan is the Texas State

Implementation Plan (SIP), an EPA-approved plan for the regulation and enforcement of the National Ambient Air Quality Standards (NAAQS) in each air quality region within the state.

This document represents an air emissions inventory prepared by the USACE, Regional Planning and Environmental Center, to assess whether air contaminant emissions that would result from the proposed GHCE Project are in conformance with the SIP for the Houston/Galveston/Brazoria (HGB) ozone nonattainment area.

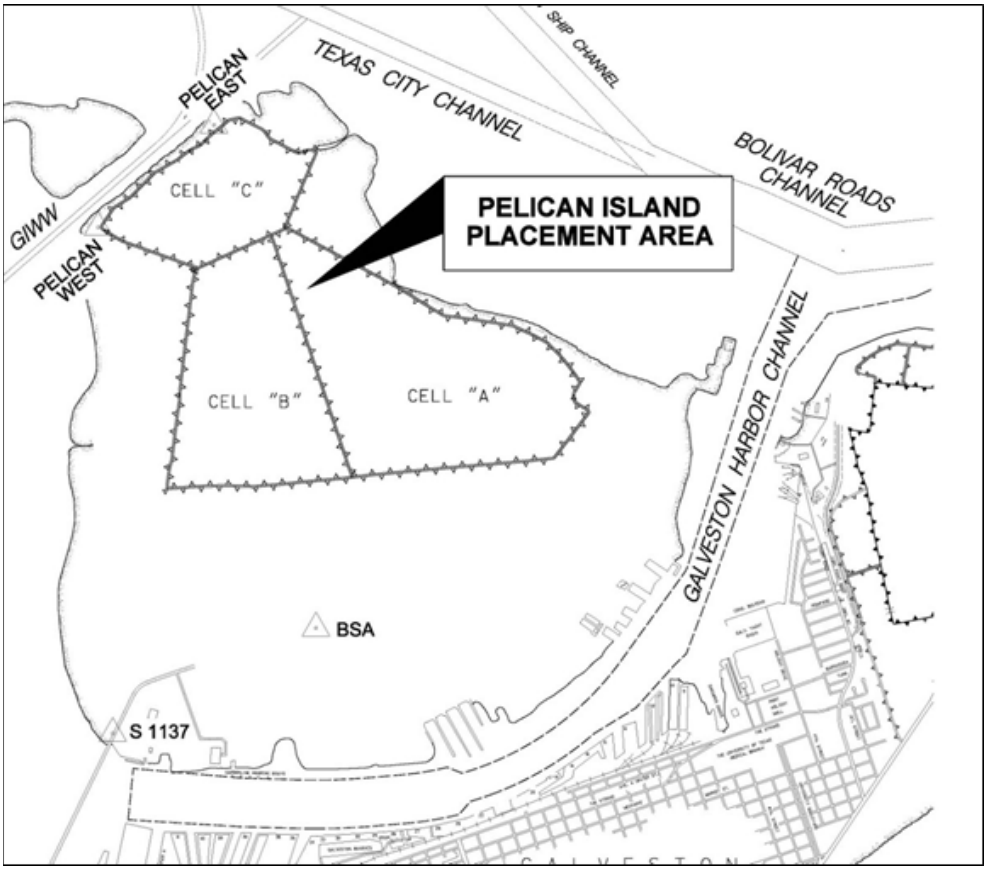

Figure 1. Project Study Area

Figure 2. GHCE Project template as approved in 2017 (blue polygon) and as proposed in 2022 (yellow shaded polygon)

2.0 REGULATORY BACKGROUND – GENERAL CONFORMITY

General Conformity refers to the process of evaluating plans, programs, and projects to determine and demonstrate they meet the requirements of the CAA and the SIP. The General Conformity Rule establishes conformity in coordination with and as part of the NEPA process. The General Conformity Rule is promulgated by the EPA and mandates that the Federal government does not engage in, support, or provide financial assistance for licensing or permitting, or approving any activity not conforming to an approved SIP. In Texas, the applicable plan is the Texas SIP, an EPA-approved plan for the regulation and enforcement of the NAAQS in each air quality region within the state.

The purpose of the General Conformity requirement is to ensure Federal agencies consult with state and local air quality districts so they become aware of the project and the expected air emissions, and would consider these expected emissions in their SIP emissions inventory. The General Conformity Rule is codified at Title 40 Code of Federal Regulations (CFR) Part 51, Subpart W, and Title 40 CFR Part 93, “Determining Conformity of Federal Actions to State or Federal Implementation Plans.” This document presents the results of a study to determine the proposed project air emissions and determine if they exceed the *de minimis* values or would

comprise more than 10% of the emissions inventory for the attainment year and thereby require a General Conformity Determination.

The CAA defines conformity to an implementation plan as the upholding of "an implementation plan's purpose of eliminating or reducing the severity and number of violations of the National Ambient Air Quality Standards and achieving expeditions attainment of such standards." Conforming activities or actions should not, through additional air pollutant emissions, result in the following:

- cause or contribute to new violation of any NAAQS in any area;
- increase the frequency or severity of any existing violation of any NAAQS in any area, or;
- delay timely attainment of any NAAQS or interim emission reductions or other milestones in any area.

Pursuant to the General Conformity Rule, a Federal agency such as the USACE must make a General Conformity Determination for all Federal actions in nonattainment areas where the total emissions of a nonattainment pollutant or its precursors exceeds levels established by the regulations. The HGB area is moderate nonattainment under the 2015 ozone NAAQS and severe under the 2008 ozone NAAQS. The general conformity *de minimis* threshold is 25 tons per year (tpy) for either nitrogen oxides ($NO_{X)}$ or volatile organic compounds (VOC). In addition, even if the total emissions of VOC or NO_X do not exceed the 25 tpy threshold levels, when the total emissions of any pollutant from the Federal action represents 10 percent or more of a nonattainment or maintenance area's total emissions of those pollutants, then the action is defined as a regionally significant action and a conformity determination would still be applicable. Only those air emissions of NO_x and VOC related to the Federal action, *i.e.*, those considered to be implemented by the USACE, should be considered when evaluating the project with regard to the *de minimis threshold* and compliance with the General Conformity Rule.

The General Conformity Determination is based on the 8-hour ozone standard and the corresponding attainment dates and *de minimis* levels. For the HGB nonattainment area, the most recently approved SIP revision is the HGB portion of the *Dallas-Fort Worth and Houston-Galveston-Brazoria Serious Classification Reasonable Further Progress State Implementation Plan Revision For The 2008 Eight-Hour Ozone National Ambient Air Quality Standard* (TCEQ, 2020), adopted on March 4, 2020. On May 10, 2021, the EPA published partial final approval of

the serious classification RFP SIP revision for the HGB nonattainment area including the RFP demonstration, associated motor vehicle emission budgets (MVEB), and revised 2011 base year emissions inventory (EI) for the HGB area (86 FR 24717). In this SIP, the attainment year inventory for NO_x and VOC ozone precursors are based on emission inventories for 2011 and future year 2020 Anthropogenic Modeling Emissions for the HGB Area I.

As discussed in the 2020 SIP revision, several emissions sources are estimated. The On-Road Mobile emissions (weekday, summer) estimate for 2020 is 79.48 tons per day (tpd) of NO_x (29,030 tpy) and 52.21 tpd of VOC (19,070 tpy) (TCEQ, 2020). The Eight County HGB total of 318.02 tpd NO_x and 479.91 tpd VOC (116,157 tpy-NO_x and 175,287 tpy-VOC) includes emissions from equipment associated with agricultural, aircraft, commercial, construction, ground support (airport), industrial, lawn and garden, railroad maintenance, logging, locomotives, oil and gas, recreational, and recreational marine equipment, in addition to the on-road Mobile emissions.

3.0 APPLICABILITY

The proposed GHCE Project is located in Galveston County, Texas. This county is included in the eight county HGB ozone nonattainment area which is classified as “serious” in terms of its degree of compliance with the 2008 8-hour ozone standard. This classification affects facilities that generate the ozone precursors, oxides of NO_x and VOC. As such, the project is subject to the General Conformity Rule which applies to all nonattainment and maintenance areas.

The proposed GHCE Project was evaluated based on the anticipated equipment to be used and identification of expected air contaminants and estimated emission rates for this project. The emissions inventory included emissions associated with dredging of the channel including worker vehicle emissions. Air contaminant emissions associated with this equipment will be primarily combustion products from fuel burned in the engines powering this equipment.

Based on this evaluation, it has been determined that a General Conformity Determination would not be required for this project, as emissions of NO_X and VOC are not estimated to exceed the 25 tpy threshold for general conformity. Because the estimated emissions of the proposed project are below the *de minimis* threshold values, the project is exempt from a General Conformity Determination with regard to the air emissions.

4.0 AIR EMISSIONS INVENTORY

To determine if a General Conformity Determination is required, an air emissions inventory was prepared for project-related activities for the GHCE Project based on the schedule and other assumptions as developed by the USACE. Air emissions estimates were calculated using techniques appropriate for a specific emission generating activity or source. The basis, emissions factors, and summary of emissions are attached to this document in Annex A.

4.1 Project Emissions

It is anticipated that the project construction activities will begin and be completed in 2024. Project air contaminant emissions were estimated based on projected equipment use for the dredging activities. The project air emissions inventory included emissions associated with dredging vessels and equipment and on-road, mobile sources as follows:

- Dredging vessels and equipment – included dredges and support marine vessels
- On-road mobile sources – included employee commuter vehicles

Air contaminant emissions were estimated in tpy for each piece of equipment based on the equipment horsepower, fuel type, and expected operating hours in 2024. Because maintenance dredging is already considered as a part of the state SIP inventory, no emissions associated with the maintenance dredging activity were included in this emission inventory. Detailed emission calculations are shown in Annex A of this document.

4.1.1 Dredging Vessels and Equipment

Dredging emissions included those that would be expected to result from the use of tug boats and miscellaneous marine vessels in support of the dredging activities. Air emissions directly related with the dredging equipment were calculated on an annual basis based on the anticipated type of engine, activity, horsepower, and anticipated hours of operation. Estimated emissions were based on the emissions factor algorithms referenced from EPA's technical report "Ports Emissions
Inventory Guidance: Methodologies for Estimating Port-Related and Goods Movement, Mobile Source Emissions," EPA 420-B-22-011, April 2022. This technical report is a compilation of engine and fuel usage test data from various types of marine vessels including bulk carriers,

container ships, dredges, tankers, and tugboats. Emission factors were determined based on emission factor tables provided as appendices to the EPA technical report for the proposed project emission sources. The emission factor tables contain data for applicable engine classes, tiers, and installed power for Harbor Craft.

4.1.2 On-road Mobile Sources

Mobile source emissions associated with the GHCE Project construction would be generated from employee (crew) commuter vehicles. Mobile on-road emissions associated with employee vehicles were calculated using EPA MOVES3.0, a mobile source emissions model. A mix of light duty gasoline passenger vehicles and light duty gasoline passenger trucks was assumed for the makeup of the employee vehicle population. An average commute of 50 miles round trip (VMT) was assumed for each vehicle. The total number of miles traveled equaled the VMT multiplied by the total number of days of construction activity times the number of vehicles. Local data for the HGB area were obtained from TCEQ and used in the MOVES3.0 model that include fuel type, meteorological data, where a summer weekday was assumed to generate the emissions factors used to estimate the total emissions from on-road mobile sources.

4.2 Galveston Harbor Channel Extension Project – Summary of NO_x and VOC Emissions

For comparison with the thresholds defined in the General Conformity Rule, the estimated annual emissions of NO_X and VOC for the GHCE Project are summarized in Table 1. Emissions of carbon monoxide, sulfur dioxide, and particulate matter are not considered in the General Conformity evaluation, as this area is in attainment with the relevant NAAQS for each of these pollutants but are provided in the appendices.

Table 1. GHCE project summary of NO_x and VOC emissions compared with the 2020 Attainment Year for the HGB Area (TCEQ, 2020).

Relevant NAAQS	2020	GHCE project (2024)
NO_X (tpy)	28,285	13.77
VOC (tpy)	11,502	0.50

The estimate of NO_X and VOC emissions for the GHCE Project would not exceed the conformity threshold of 25 tpy and, thus, a General Conformity Determination for air emissions would not be required for this project based on this requirement of the General Conformity Rule.

4.3 Maintenance Dredging

After the extension of the channel is completed, the USACE anticipates the need to perform maintenance dredging of the channel to remove any shoaling that will occur after the construction period in advance, termed advanced maintenance dredging. This work will be performed under the same contract. The General Conformity rules specifically exclude from applicability maintenance dredging where no new depths are required, applicable permits are secured, and disposal will be at an approved disposal site. Therefore, the air emissions inventory prepared for this project does not include emissions from the anticipated maintenance dredging activities.

4.3 Allowable Overdepth

During dredging operations, it is recognized that a contractor may dredge deeper than planned to ensure that the resulting channel meets the required minimum depth. This additional dredge material is termed “Allowable Overdepth” and could be as much as 1-foot in depth. Overdepth dredging was assumed to occur half the time, resulting in 0.5-foot overdepth uniformly over the project area and the air emissions inventory includes the emissions resulting from this work.

5.0 COMPLIANCE WITH GENERAL CONFORMITY RULE

The proposed GHCE Project would conform to the applicable SIP if, for each pollutant that exceeds the threshold rates (25 tpy of NO_x or VOC), total emissions from the action comply, or are consistent with all relevant requirements and milestones contained in the applicable SIP. Under 40 CFR Part 93, Subpart B, “Determining Conformity of General Federal Actions to Sate or Federal Implementation Plans,” a Federal action required to have a conformity determination for a specific pollutant would be determined to conform to the SIP if it meets one of several requirements in 40 CFR §93.158, “Criteria for Determining Conformity of General Federal Actions.”

Based on evaluation of the proposed project description and the estimated air quality emissions, it is believed that project emissions are exempted from meeting the requirements of 40 CFR §93.158(a)(5)(i)(A). This section of the Federal General Conformity Rule applies to an ozone nonattainment area, where the EPA has approved a revision to an area's attainment demonstration after 1990, and the state makes a determination that "the total of direct and indirect emissions from the action, or portion thereof, is determined by the State agency responsible for the applicable SIP to result in a level of emissions which, together with all other emissions in the nonattainment area, would not exceed the emissions budgets (*sic.* attainment year inventory) specified in the SIP."

5.1 Galveston Harbor Channel Extension Project Emissions Compared to SIP Attainment Year Inventory Emissions

The annual NO_x and VOC emission rates estimated for the GHCE Project may be summarized in terms of tons per year and compared to the SIP on-road mobile source attainment year emissions inventory for HGB as shown on **Error! Reference source not found.**. The estimated GHCE Project emissions are also compared to the total, eight-county attainment year emission inventory for 2020

Table 2. GHCE Project estimated NO_x and VOC emissions compared to 2020 HGB weekday (August) on-road mobile source attainment year inventory emissions (TCEQ, 2020).

	NO_x	**VOC**
GHCE Project On-Road mobile(tpy)	0.015	0.002
HGB 2020 On-Road mobile (tpy)	29,030	19,070
Percentage of On-road Mobile	0.00005%	0.00001%
GHCE Project total (tpy)	13.8	0.50
HGB 2020 Eight County total (tpy)	116,157	175,287
Percentage of HGB 2020 total	0.01185%	0.00028%

As shown in **Error! Reference source not found.**, emissions for the GHCE Project emissions would represent less than 2/100 of one percent of the SIP 2020 total emissions for NO_x from all sources and less than 1/1000th of one percent of the total VOC emissions from all sources within the eight counties that comprise the HGB area.

5.2 Preliminary General Conformity Determination

Based on an evaluation of the proposed GHCE Project emissions, it is believed that the total emissions of NO_x and VOC would result in levels that are below the *de minimis* threshold values and less than 10% of the values for the most recently approved SIP revision (2020). As the GHCE Project is not unusual in scope for an area like the HGB, it is anticipated that emissions from the project will be less than an increase of 1% of the VOC and NO_x emissions for the entire HGB nonattainment area. Therefore, emissions form the activities subject to the USACE action are not considered regionally significant for purposes of General Conformity. Because of this, it is expected that emissions from the project construction will not:

- cause or contribute to new violation of any NAAQS in any area;
- increase the frequency or severity of any existing violation of any NAAQS in any area or;
- delay timely attainment of any NAAQS or interim emissions reduction or other milestones in any area.

Pursuant to the General Conformity Rule (40 CFR Part 93, Subpart B), this air emissions inventory was prepared to demonstrate that the proposed GHCE Project will comply with the requirements of the General Conformity Rule and will be in conformity with the SIP. As specified in the Federal General Conformity Rules, 40 CFR §93.158(a)(5)(i)(A), the state must decide that the total emissions of NO_x or VOC from the action, or portion thereof, would result in a level of emissions which, together with all other emissions in the HGB nonattainment area, would not exceed the attainment year emissions inventory specified in the SIP and a General Conformity Determination will not be required.

6.0 REFERENCES

40 Code of Federal Regulations (CFR) Part 93, Subpart, B, “Determining Conformity of General Federal Actions to State and Federal Implementation Plans.”

TCEQ. 2020. “Dallas-Fort Worth and Houston-Galveston-Brazoria Serious Classification Reasonable Further Progress State Implementation Plan Revision for the 2008 Eight-Hour Ozone Standard Nonattainment Area”, 2019-079-SIP-NR Adoption March 4, 2020.

TCEQ. 2004. “Nonroad Emissions Model Draft NONROAD 2002 Support Document, ‘Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling’” April 2004.

TexN2.2 “Utility Updates for Compatibility with the US EPA MOVES3 Model, TexN2.2 User’s Guide Final”, April 2021.

U.S. Environmental Protection Agency (EPA). 2000. “Ports Emissions Inventory Guidance: Methodologies for Estimating Port-Related and Goods Movement Mobile Source Emissions” EPA-420-B-22-011, April 2022.

U.S. Environmental Protection Agency (EPA). 2002. “Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling”, EPA Office of Air and Radiation Report Number NR-005b, December 2002

EPA. 2006. “Approval and Promulgation of Air Quality Implementation Plans; Texas; Revisions to the Ozone Attainment Plan for the Houston/Galveston/Brazoria Nonattainment Area,” 6 September 2006. *Federal Register*, Volume 71, No. 172, Page 52670.

Air Emissions Inventory Annex

Tables A-1 through A-7

7.0 ANNEX A

Table A-1. Annual GHCE Project Emissions Summary in Tons Per Year

Year 2024	**CO**	**NO_x**	**$PM_{2.5}$**	**PM_{10}**	**SO_2**	**VOC**
Dredge & Support Equipment	2.10	13.75	0.39	0.30	0.01	0.49
Employee Vehicles	0.116	0.015	-	-	-	0.002
Total	**2.21**	**13.77**	**0.39**	**0.30**	**0.01**	**0.50**

Note: no construction planned at the placement area; existing embankments adequate to contain estimated volumes, including adv. Maintenance and overdepth.

Table A - 2. Dredge Equipment Engine Horsepower and Hours of Operation, GHCE Project

	Dredge Barge*				**Survey**	**Tugs (3)**	**Crew Boat**
	Pumps (2)	Propulsion**	Generator	Idling***	Main Engine	Propulsion	Propulsion
Horsepower	6,000	-	2,700	2,700	350	1,500	400
Duration (hours)	563	-	563	253	36	450	113

Notes:

-Information is for Channel Harbor Extension and additional channel; 30" Dredge
-Dredge time based on 264,081 cubic yards (CY) including new work and half overdepth volumes, no maintenance dredging

* dredging operation requires 2 pumps and generator; ** = propelling by tug, no pumping; *** = Idling requires generator only

-Tug = 3 @ 500 HP each

-Survey Boat assumed to operate for 3 days after dredge is completed; estimated to be 350 HP and 12 hrs/day

-Crew boat assumed to operate 20% of total dredging time

Table A - 3. Marine Equipment Load Factors and Emission Factors

	Dredge Barge*				Survey	Tug	Crew
Operating Mode	Pumping	Generating	Propelling**	Idling***	Propelling	Propelling	Propelling
Load Factor	0.43	0.43	N/A	0.2	0.45	0.5	0.45
	EF (grams/kW-hr)						
CO	0.9	0.9	N/A	0.9	1.6	1.1	0.9
NO_x	6.1	6.1	N/A	6.1	5.7	6	4.54
PM	0.201961	0.201961	N/A	0.2019611	0.233201	0.126607995	0.06502198
$PM_{2.5}$	0.183785	0.183785	N/A	0.1837846	0.212213	0.115213275	0.05917
PM_{10}	0.134613	0.134613	N/A	0.1346133	0.218777	0.118776572	0.061
SO_2	0.006246	0.006246	N/A	0.0062464	0.006246	0.006246417	0.00624642
VOC	0.22113	0.22113	N/A	0.221130	0.43173	0.20007	0.1053

Notes:

* = dredging operation requires 2 pumps and generator; ** = propelling by tug, no pumping; *** = Idling requires generator only

-C1 and C2 marine vessels are assumed to be using ultra low sulfur diesel (ULSD)

-Load factors for the dredge auxiliary engines and support vessels were determined from Table 4-4 of the EPA Report "Ports Emissions Inventory Guidance: Methodologies for Estimating Port-Related and Goods Movement Mobile Source Emissions", February 2022.

-Emission factors for diesel C1 and C2 propulsion engine(s), which comprise most harbor craft and the auxiliary engines, are presented in Appendix H of the EPA Report (2022).

Table A - 4. Dredging Equipment Emissions in tons per year (tpy)

NAAQS (tpy)	Dredge Barge				Survey	Tugs (3)	Crew Boat	TOTALS
	Pumps (2)	Propulsion	Generator	Idling	Propelling	Propelling	Propelling	
CO	1.068	N/A	0.482	0.217	0.0074	0.3069	0.0151	2.097
NO_x	7.237	N/A	3.269	1.471	0.0265	1.6741	0.0760	13.754
$PM_{2.5}$	0.218	N/A	0.098	0.044	0.0010	0.0321	0.0010	0.395
PM_{10}	0.160	N/A	0.072	0.032	0.0010	0.0331	0.0010	0.299
SO_2	0.007	N/A	0.003	0.002	0.0000	0.0017	0.0001	0.014
VOC	0.262	N/A	0.119	0.053	0.0020	0.0558	0.0018	0.494

Notes:

* = dredging operation requires 2 pumps and generator; ** = propelling by tug, no pumping; *** = Idling requires generator only

-The Emission Rate in tons/year is based on the following formula:

Emission Rate = HP*LF*EF*Duration*(0.0022046 lbs/grams)*(1 ton/2,000 lbs).

Table A - 5. Crew Size per Equipment, Galveston Harbor Channel Extension and Additional Channel Project

	Cutter Dredge Crew	Shore Crew	Other Construction Equipment
Employees	31	0	0

Table A - 6. Emission Factors for Employee Vehicles, Galveston Harbor Channel Extension and Additional Channel Project

County	Vehicle Type	EPA Category [a]	Emission Factor (g/mile)[b]			Emission Factor (g/vehicle)[c]		
			CO	NO_x	VOC	CO	NO_x	VOC
Galveston	Cars	LDGV	1.36	0.009	0.0084	0.368	0.021	0.032
Galveston	Pickups	$LDGT_1$	2.88	0.550	0.0473	0.428	0.031	0.042

Notes: All rate-per-distance emission factors are for model years 2013-2023; rural restricted road type 2, speed bins 1-8, include running exhaust (1), crankcase running exhaust (15), and may also include evap permeation (11), evap fuel vapor venting (12), evap fuel leaks (13), crankcase start exhaust (16), crankcase extended idle exhaust (17), refueling displacement vapor loss (18), and refueling spillage loss (19) when appropriate for the pollutant.

a. LDGV = light duty gasoline-fueled vehicles, passenger, SCC = 220x21xxxx

$LDGT_1$ = light duty gasoline-fueled trucks, passenger, SCC = 220x31xxxx

b. rate per distance emission factors for CO, NO_x, and VOC are from MOVES3.0 run using Galveston County input files for fuel, meteorology, etc. obtained from the TCEQ

c. rate per vehicle use for start exhaust (2) only, also obtained from MOVES3.0 run for Galveston County

Table A - 7. Galveston Harbor Channel Extension and Additional Channel Project - Employee vehicle emissions

Project Year	Vehicle Type	EPA Category	Daily Vehicles (No./Days)	Total (VMT)	Travel Days (Days/Year)	Annual Travel (VMT/Year)	Annual Emmissions (tpy)		
							CO	NO_x	VOC
2024	Cars	LDGV	15.5	50	31.5	24,412.50	0.0374	0.0003	0.0003
2024	Pickups	LDGT1	15.5	50	31.5	24,412.50	0.0783	0.0149	0.0014
						Totals	**0.1157**	**0.0151**	**0.0017**

Notes:

1. Total VMT is assumed to be 50 miles/day roundtrip; travel days includes new work and half overdepth, no adv. maintenance.
2. Annual travel = Daily vehicles * Total VMT * Travel daysr
3. Annual emissions = Emissions Factor * Annual Travel * 1 lb/453.6 grams * 1 ton/2,000 lb

Appendix D-4 Agency Coordination

HGNC Galveston Channel Extension
Galveston, Galveston County, Texas
Draft Validation Report

March 2024

US Army Corps of Engineers
Galveston District

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DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

January 22, 2024

Mr. Robert Houston
US Environmental Protection Agency, Region 6
Communities, Tribes, and Environmental Assessment
1201 Elm Street, Suite 500
Dallas, Texas 75270

Dear Mr. Houston,

The US Army Corps of Engineers Galveston District (Corps) is hereby notifying you of design modifications to the Galveston Harbor Channel Extension (GHCE) project that occurred during the pre-construction, engineering, and design (PED) phase and requesting your review and comment on the Supplemental Environmental Assessment (EA) that prepared to document the impacts of the modifications.

In 2013, the Corps prepared a draft EA analyzing the project and made it available for public and agency review beginning May 10, 2013. At that time, your agency commented in a letter dated June 10, 2013. The Recommended Plan (RP) included deepening 2,571 feet of the Galveston Harbor Channel (GHC) from -41 feet mean low, low water (MLLW)[1] To -46 feet MLLW, with three feet of advanced maintenance and two feet of allowable depth, beginning near the Port of Galveston (POG) Pier 38 at Station 20+000, continuing westward towards Pelican Island Bridge and ending at Station 22+571. The RP was anticipated to dredge approximately 609,500 cubic yards (cy) of material and place it within the existing Pelican Island Placement Area (PA). The RP also included a dike raise at the Pelican Island, which resulted in a total construction duration of four months, of which 62.5 days involved dredging. The Finding of No Significant Impact (FONSI) and Final EA was published in 2016.

During the PED phase, the design team and the Galveston Wharves Board of Trustees (the non-Federal sponsor for the project) refined the RP design. Proposed modifications were based on a concern raised by the NFS regarding maneuverability and access to berthing areas at the most western end of the channel, as well as more detailed information that allowed for greater certainty of the dredging need. As a result, four design modifications were made:

- inclusion of a 505-foot additional channel between Stations 22+571 and 23+076 at the far western end of the GHC that would be deepened to -46 feet MLLW;
- change in sediment quantities as a result of updated bathymetric surveys;
- change in channel template design that incorporates new policies regarding advanced maintenance and allowable over depth; and

[1] During PED, converted the mean low tide (MLT) elevations used in the 2013 and 2016 EA to mean low water, which results in a -1-foot difference.

- elimination of the Pelican Island PA dike raising (the Proposed Modified RP).

These changes result in a total decrease in sediment quantity for 600,500 cy to be placed on Pelican Island, PA. Additionally, the project is anticipated to take one month less than the RP, for a contract duration of 4 months, of which 3 months is expected to be actual construction, of which 43 days involves dredging. A Supplemental EA has been prepared and is available on the Galveston District website at: https://www.swg.usace.army.mil/Projects/Houston-Galveston-Navigation-Channel-Galveston-Harbor-Channel-Extension/.

This Supplemental EA was prepared in accordance with the National Policy Act of 1969, as amended and implemented by the Council on Environmental Quality (40 CFR Parts 1500-1508). The Corps is requesting your agency review the Supplemental EA and provide comments on the Proposed Modified RP to Justin Tirpak at Justin.M.Tirpak@usace.army.mil by February 24, 2024.

If you have any questions, please contact Justin Tirpak, Environmental Branch, Regional Planning and Environmental Center, at Justin.M.Tirpak@usace.army.mil or by phone at 501-276-9184.

Brandon Wadlington

Brandon E. Wadlington
Chief, NEPA & Natural Resources Section
Regional Planning and Environmental Center

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, GALVESTON DISTRICT
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

January 22, 2024

REPLY TO THE ATTENTION OF
CESWF-PEE-C

Mr. Chuck Ardizzone
United States Fish and Wildlife Service
Texas Coastal Ecological Services–Houston
17629 El Camino Real, Suite 211
Houston, Texas 77058

Dear Mr. Ardizzone:

The U.S. Army Corps of Engineers Galveston District (Corps) is hereby notifying you of design modifications to the Galveston Harbor Channel Extension (GHCE) project that occurred during the pre-construction, engineering, and design (PED) phase. The Corps is hereby submitting a supplemental Biological Assessment (BA) for your records and requesting initiation of informal consultation.

In 2016, the Corps prepared a biological assessment (BA) for the GHCE Recommended Plan (2016 RP), which considered deepening 2,571 feet of the Galveston Harbor Channel (GHC) from -41 feet mean low, low water (MLLW) to -46 feet MLLW, with three feet of advanced maintenance and two feet of allowable over depth beginning near the Port of Galveston (POG) Pier 38 at Station 20+000, continuing westward towards Pelican Island Bridge and ending at Station 22+571. The 2016 RP would remove approximately 609,500 cubic yards (cy) of dredge material and place it within the existing Pelican Island Placement Area (PA). The 2016 RP also included a dike raise at the Pelican Island, which resulted in a total construction duration of four months, of which 62.5 days involved dredging. The 2016 BA made a no-effect determination for all listed species at the time.

During the PED phase, the design team and the Galveston Wharves Board of Trustees (the non-Federal sponsor for the project) refined the RP design. Proposed modifications were based on a concern raised by the NFS regarding maneuverability and access to berthing areas at the most western end of the channel, as well as more detailed information that allowed for greater certainty of the dredging need. As a result, four design modifications were made:

- inclusion of a 505-foot additional channel between Stations 22+571 and 23+076 at the far western end of the GHC that would be deepened to -46 feet MLLW;
- change in sediment quantities as a result of updated bathymetric surveys;
- change in channel template design that incorporates new policies regarding advanced maintenance and allowable over depth; and
- elimination of the Pelican Island PA dike raising (the Proposed Modified RP).

These changes result in a decrease in sediment quantity for a total of 600,500 cy that will be placed on Pelican Island, PA. Additionally, the project is anticipated to take one month less than the RP, for a contract duration of 4 months, of which 3 months is expected to be actual construction, of which 43 days involves dredging. A Supplemental EA has been prepared and is available on the Galveston District website at: https://www.swg.usace.army.mil/Projects/Houston-Galveston-Navigation-Channel-Galveston-Harbor-Channel-Extension/.

Because of the changes in project design, listing/identification of additional species, and changes in potential species present in the action area since 2016, a Supplemental BA has been prepared to analyze the impacts of implementing the Proposed Modified RP (Enclosure). We request the initiation of informal consultation under Section 7(a)(2) of the Endangered Species Act (Project Code: 2022-0034255). Based on the enclosed analysis, the Corps has determined the Proposed Modified RP ***may affect but is not likely to adversely affect*** the West Indian Manatee (*Trichechus manatus*) because, with the conservation measures in place, all effects on the species and its habitat would be insignificant and discountable. We request your concurrence with this determination.

The Corps has also determined that the action would have ***no effect*** on Attwater's greater prairie-chicken (*Tympanuchus cupido attwateri*), piping plover (*Charadrius melodus*), rufa red knot (*Calidris canutus rufa*), eastern black rail (*Laterallus jamaicensis*), whooping crane (*Grus americana*), monarch butterfly (*Danaus plexippus*), or any of the five sea turtles while on land due to lack of suitable habitat and use of the action area. No critical habitat is present.

If you have any questions or need additional information, please contact Justin Tirpak, Environmental Branch, Regional Planning and Environmental Center, at Justin.M.Tirpak@usace.army.mil or by phone at 501-276-9184.

Brandon Wadlington

Brandon E. Wadlington
Chief, NEPA & Natural Resources Section
Regional Planning and Environmental Center

Enclosure

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

January 22, 2024

Ms. Leslie Koza
Texas General Land Office
PO Box 12873
Austin, Texas 78711-2873

Dear Ms. Koza,

The US Army Corps of Engineers Galveston District (Corps) is hereby notifying you of design modifications to the Galveston Harbor Channel Extension (GHCE) project that occurred during the pre-construction, engineering, and design (PED) phase. In 2013, the Corps prepared a Coastal Zone Management Act report to show the Recommended Plan (RP) was compliant with the Goals and Policies of the Texas Coastal Management Program (CMP) and determined that the project would have no adverse effects on the Coastal Natural Resource Areas (CNRAs) found in the project area.

In 2013, the Corps prepared a draft EA analyzing the project and made it available for public and agency review beginning May 10, 2013. At that time, your agency commented in a letter dated June 10, 2013. The Recommended Plan (RP) included deepening 2,571 feet of the Galveston Harbor Channel (GHC) from -41 feet mean low, low water (MLLW)[1] To -46 feet MLLW, with three feet of advanced maintenance and two feet of allowable depth, beginning near the Port of Galveston (POG) Pier 38 at Station 20+000, continuing westward towards Pelican Island Bridge and ending at Station 22+571. The RP was anticipated to dredge approximately 609,500 cubic yards (CY) of material and place it within the existing Pelican Island Placement Area (PA). The RP also included a dike raise at the Pelican Island, which resulted in a total construction duration of four months, of which 62.5 days involved dredging. The Finding of No Significant Impact (FONSI) and Final EA was published in 2016.

During the PED phase, the design team and the Galveston Wharves Board of Trustees (the non-Federal sponsor for the project) refined the RP design. Proposed modifications were based on a concern raised by the NFS regarding maneuverability and access to berthing areas at the most western end of the channel, as well as more detailed information that allowed for greater certainty of the dredging need. As a result, four design modifications were made:

- inclusion of a 505-foot additional channel between Stations 22+571 and 23+076 at the far western end of the GHC that would be deepened to -46 feet MLLW;
- change in sediment quantities as a result of updated bathymetric surveys;

[1] During PED, converted the mean low tide (MLT) elevations used in the 2013 and 2016 EA to mean low down water, which results in a -1-foot difference.

- change in channel template design that incorporates new policies regarding advanced maintenance and allowable over depth; and
- elimination of the Pelican Island PA dike raising (the Proposed Modified RP).

These changes resulted in a total decrease in sediment quantity for 600,500 cy to be placed on Pelican Island, PA. Additionally, the project is anticipated to take one month less than the RP, for a contract duration of 4 months, of which 3 months is expected to be actual construction, of which 43 days involves dredging. A Supplemental EA has been prepared and is available on the Galveston District website at: https://www.swg.usace.army.mil/Projects/Houston-Galveston-Navigation-Channel-Galveston-Harbor-Channel-Extension/.

The Corps has determined that expansion of the project footprint does not cross into CNRAs not already considered in 2013, and the overall project would result in a shortened construction duration with less sediment dredged; thereby, the Proposed Modified RP would remain compliant with the Goals and Polices of the CMP as indicated in the 2013 report. Based on these conclusions, the Corps does not intend to reinitiate consultation at this time and will operate under the Consistency Determination provided by your office dated July 17, 2013 (CMP #13-1178-F2)

If you have any questions, please contact Justin Tirpak, Environmental Branch, Regional Planning and Environmental Center, at Justin.M.Tirpak@usace.army.mil or by phone at 501-276-9184.

Brandon Wadlington

Brandon E. Wadlington
Chief, NEPA & Natural Resources Section
Regional Planning and Environmental Center

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, GALVESTON DISTRICT
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

January 22, 2024

REPLY TO THE ATTENTION OF
CESWF-PEE-C

Dr. Roy E. Crabtree
Regional Administrator
National Marine Fisheries Service
Southeast Regional Office
Protected Resources Division
263 13th Avenue South
St. Petersburg, Florida 33701-5505

Dear Dr. Crabtree:

The U.S. Army Corps of Engineers Galveston District (Corps) is hereby notifying you of design modifications to the Galveston Harbor Channel Extension (GHCE) project that occurred during the pre-construction, engineering, and design (PED) phase. The Corps is hereby submitting a supplemental Biological Assessment (BA) for your records and requesting initiation of informal consultation.

In 2016, the Corps prepared a biological assessment (BA) for the GHCE Recommended Plan (2016 RP), which considered deepening 2,571 feet of the Galveston Harbor Channel (GHC) from -41 feet mean low, low water (MLLW) to -46 feet MLLW, with three feet of advanced maintenance and two feet of allowable over depth beginning near the Port of Galveston (POG) Pier 38 at Station 20+000, continuing westward towards Pelican Island Bridge and ending at Station 22+571. The 2016 RP would remove approximately 609,500 cubic yards (cy) of dredge material and place it within the existing Pelican Island Placement Area (PA). The 2016 RP also included a dike raise at the Pelican Island, which resulted in a total construction duration of four months, of which 62.5 days involved dredging. The 2016 BA made a no-effect determination for all listed species at the time.

During the PED phase, the design team and the Galveston Wharves Board of Trustees (the non-Federal sponsor for the project) refined the RP design. Proposed modifications were based on a concern raised by the NFS regarding maneuverability and access to berthing areas at the most western end of the channel, as well as more detailed information that allowed for greater certainty of the dredging need. As a result, four design modifications were made:

- inclusion of a 505-foot additional channel between Stations 22+571 and 23+076 at the far western end of the GHC that would be deepened to -46 feet MLLW;
- change in sediment quantities as a result of updated bathymetric surveys;
- change in channel template design that incorporates new policies regarding advanced maintenance and allowable over depth; and

- elimination of the Pelican Island PA dike raising (the Proposed Modified RP).

These changes result in a decrease in sediment quantity for a total of 600,500 cy that will be placed on Pelican Island, PA. Additionally, the project is anticipated to take one month less than the RP, for a contract duration of 4 months, of which 3 months is expected to be actual construction, of which 43 days involves dredging. A Supplemental EA has been prepared and is available on the Galveston District website at: https://www.swg.usace.army.mil/Projects/Houston-Galveston-Navigation-Channel-Galveston-Harbor-Channel-Extension/.

Because of the changes in project design, listing/identification of additional species, and changes in potential species present in the action area since 2016, a Supplemental BA has been prepared to analyze the impacts of implementing the Proposed Modified RP (Enclosure). We request the initiation of informal consultation under Section 7(a)(2) of the Endangered Species Act. Based on the enclosed analysis, the Corps has determined the Proposed Modified RP *may affect but is not likely to adversely affect* the Kemp's Ridley sea turtle (*Lepidochelys kempii*) and the loggerhead sea turtle (*Caretta caretta*) because, of the conservation measures in place, all effects to the species and its habitat would be insignificant and discountable. We request your concurrence with this determination.

The Corps has also determined that the action would have *no effect* on oceanic whitetip shark (*Carcharhinus longimanus*), giant manta ray (*Manta birostris*), sperm whale (*Physeter macrocephalus*), Rice's whale (*Balaenoptera ricei*), green sea turtle (*Chelonia mydas*), hawksbill sea turtle (*Eretmochelys imbricata*), and the leatherback sea turtle (*Dermochelys coriacea*) due to lack of suitable habitat and use of the action area. No critical habitat is present.

If you have any questions or need additional information, please contact Justin Tirpak, Environmental Branch, Regional Planning and Environmental Center, at Justin.M.Tirpak@usace.army.mil or by phone at 501-276-9184.

Brandon Wadlington

Brandon E. Wadlington
NEPA & Natural Resources Section Chief
Regional Planning and Environmental Center

Enclosure

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

January 22, 2024

Dr. Emma Clarkson
Texas Parks and Wildlife Division
Ecosystem Resources Program Director
Texas Parks and Wildlife Department
1409 Waldron Road
Corpus Christi, Texas 78418

Dear Dr. Clarkson,

The US Army Corps of Engineers Galveston District (Corps) is hereby notifying you of design modifications to the Galveston Harbor Channel Extension (GHCE) project that occurred during the pre-construction, engineering, and design (PED) phase and requesting your review and comment on the Supplemental Environmental Assessment (EA) that prepared to document the impacts of the modifications.

In 2013, the Corps prepared a draft EA analyzing the project and made it available for public and agency review beginning May 10, 2013. At that time, your agency commented in a letter dated June 10, 2013. The Recommended Plan (RP) included deepening 2,571 feet of the Galveston Harbor Channel (GHC) from -41 feet mean low, low water (MLLW)[1] To -46 feet MLLW, with three feet of advanced maintenance and two feet of allowable depth, beginning near the Port of Galveston (POG) Pier 38 at Station 20+000, continuing westward towards Pelican Island Bridge and ending at Station 22+571. The RP was anticipated to dredge approximately 609,500 cubic yards (cy) of material and place it within the existing Pelican Island Placement Area (PA). The RP also included a dike raise at the Pelican Island, which resulted in a total construction duration of four months, of which 62.5 days involved dredging. The Finding of No Significant Impact (FONSI) and Final EA was published in 2016.

During the PED phase, the design team and the Galveston Wharves Board of Trustees (the non-Federal sponsor for the project) refined the RP design. Proposed modifications were based on a concern raised by the NFS regarding maneuverability and access to berthing areas at the most western end of the channel, as well as more detailed information that allowed for greater certainty of the dredging need. As a result, four design modifications were made:

- inclusion of a 505-foot additional channel between Stations 22+571 and 23+076 at the far western end of the GHC that would be deepened to -46 feet MLLW;
- change in sediment quantities as a result of updated bathymetric surveys;

[1] During PED, converted the mean low tide (MLT) elevations used in the 2013 and 2016 EA to mean low down water, which results in a -1-foot difference.

- change in channel template design that incorporates new policies regarding advanced maintenance and allowable over depth; and
- elimination of the Pelican Island PA dike raising (the Proposed Modified RP).

These changes result in a decrease in sediment quantity for a total of 600,500 cy that will be placed on Pelican Island, PA. Additionally, the project is anticipated to take one month less than the RP, for a contract duration of 4 months, of which 3 months is expected to be actual construction, of which 43 days involves dredging. A Supplemental EA has been prepared and is available on the Galveston District website at: https://www.swg.usace.army.mil/Projects/Houston-Galveston-Navigation-Channel-Galveston-Harbor-Channel-Extension/.

Overall, the revisions result in an increase in the disturbance footprint by approximately 11.0 acres. Still, habitat avoidance impacts (e.g., noise, vibration, turbidity, etc.) by fish and wildlife resources are expected to decrease by one month over the RP. Under the Fish and Wildlife Coordination Act, the Corps is requesting your agency review the Supplemental EA and provide comments on the Proposed Modified RP to Justin Tirpak at Justin.M.Tirpak@usace.army.mil by February 24, 2024.

If you have any questions, please contact Justin Tirpak, Environmental Branch, Regional Planning and Environmental Center, at Justin.M.Tirpak@usace.army.mil or by phone at 501-276-9184.

Brandon Wadlington

Brandon E. Wadlington
Chief, NEPA & Natural Resources Section
Regional Planning and Environmental Center

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

January 22, 2024

Mr. Peter Schaefer
Texas Council on Environmental Quality
Water Quality Assessment Section, MC 150
P.O. Box 13087
Austin, Texas 78711-3087

Dear Mr. Schaefer,

The U.S. Army Corps of Engineers Galveston District (Corps) is hereby notifying you of design modifications to the Galveston Harbor Channel Extension (GHCE) project that occurred during the pre-construction, engineering, and design (PED) phase. In 2013, the Corps requested and received a Water Quality Certification for work proposed in the Draft 2013 Environmental Assessment (EA) and as described in the Joint Public Notice HGCN-13-01 issued May 10, 2013.

In 2013, the Corps prepared a draft EA analyzing the project and made it available for public and agency review beginning May 10, 2013. At that time, your agency commented in a letter dated June 10, 2013. The Recommended Plan (RP) included deepening 2,571 feet of the Galveston Harbor Channel (GHC) from -41 feet mean low, low water (MLLW)[1] To -46 feet MLLW, with three feet of advanced maintenance and two feet of allowable depth, beginning near the Port of Galveston (POG) Pier 38 at Station 20+000, continuing westward towards Pelican Island Bridge and ending at Station 22+571. The RP was anticipated to dredge approximately 609,500 cubic yards (cy) of material and place it within the existing Pelican Island Placement Area (PA). The RP also included a dike raise at the Pelican Island, which resulted in a total construction duration of four months, of which 62.5 days involved dredging. The Finding of No Significant Impact (FONSI) and Final EA were published in 2016.

During the PED phase, the design team and the Galveston Wharves Board of Trustees (the non-Federal sponsor for the project) refined the RP design. Proposed modifications were based on a concern raised by the NFS regarding maneuverability and access to berthing areas at the most western end of the channel, as well as more detailed information that allowed for greater certainty of the dredging need. As a result, four design modifications were made:

- inclusion of a 505-foot additional channel between Stations 22+571 and 23+076 at the far western end of the GHC that would be deepened to -46 feet MLLW;
- change in sediment quantities as a result of updated bathymetric surveys;

[1] During PED, the mean low tide (MLT) elevations used in the 2013 and 2016 E.A. were converted to mean low down water, which results in a -1-foot difference.

- change in channel template design that incorporates new policies regarding advanced maintenance and allowable over depth; and
- elimination of the Pelican Island PA dike raising (the Proposed Modified R.P.).

These changes result in a total decrease in sediment quantity for 600,500 cy to be placed on Pelican Island, PA. Additionally, the project is anticipated to take one month less than the RP, for a contract duration of 4 months, of which 3 months is expected to be actual construction, of which 43 days involves dredging. A Supplemental EA has been prepared and is available on the Galveston District website at: https://www.swg.usace.army.mil/Projects/Houston-Galveston-Navigation-Channel-Galveston-Harbor-Channel-Extension/.

The Corps has determined that expansion of the project footprint and revised design would result in a shortened construction duration and less sediment dredged than what was assessed by TCEQ for issuing the 2013 WQC. The Modified RP would not change the duration or method of discharge and decant out of the Pelican Island PA compared to the existing condition. Based on this conclusion, the Corps is not requesting a new WQC and will operate under the WQC provided by your office dated July 9, 2013.

If you have any questions, please contact Justin Tirpak, Environmental Branch, Regional Planning and Environmental Center, at Justin.M.Tirpak@usace.army.mil or by phone at 501-276-9184.

Brandon Wadlington

Brandon E. Wadlington
Chief, NEPA & Natural Resources Section
Regional Planning and Environmental Center

From: Peter Schaefer
To: Tirpak, Justin M CIV USARMY USACE (USA)
Cc: Fisher, Melinda CIV USARMY CESWF (USA)
Subject: [Non-DoD Source] RE: Galveston Harbor Channel Extension TCEQ Notice Letter
Date: Tuesday, January 23, 2024 11:53:31 AM

Thanks Justin. I see that a 401 water quality certification is not needed to address the changes to the project plans. If that changes or if you need anything else from TCEQ, don't hesitate to reach out.

Thanks!

Peter

Peter Schaefer, Team Leader
Standards Implementation Team (MC 150)
Water Quality Assessment Section
Water Quality Division, TCEQ
email: *peter.schaefer@tceq.texas.gov*
phone: 512-239-4372
fax: 512-239-4420

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

April 15, 2022

Mr. Mark Wolfe
State Historic Preservation Officer
Texas Historical Commission
P.O. Box 12276
Austin, TX 78711-2276

Dear Mr. Wolfe:

The U.S. Army Corps of Engineers, Galveston District (USACE), and the non-federal sponsor, the Port of Galveston, are proposing improvements to the Galveston Harbor Channel (GHC) in Galveston County Texas. The Galveston Harbor Channel Extension Project is a federal undertaking subject to Section 106 of the National Historic Preservation Act of 1966, as amended. The USACE is the lead federal agency for this undertaking.

During the feasibility study phase of this project and as part of our development of an Environmental Assessment (E.A.), the USACE consulted with your office in 2008 regarding the recommended plan for deepening the last 2,572 feet of the existing 41-foot deep GHC to 46 feet and placing dredged material within the Pelican Island Placement Area. The response to that consultation concurred with the USACE's determination that no historic properties were affected by the recommended plan. It noted *"…that the area is heavily developed along both shores of the ship channel, which precludes the effective magnetometer survey along the periphery of the existing channel. The area is most likely to contain preserved historic resources. We feel that additional archeological survey for the proposed channel deepening would be unproductive and do not recommend such survey*."

Since the development of the E.A. and Feasibility study, the USACE proposes to extend the GHC another 228 feet to 492 feet beyond the existing terminus of the channel. The extension would be the same width as the current channel (1,085 feet wide) and dredged to 46 feet deep (including 5 feet of advanced maintenance and allowable over-depth); the proposed depth of the recommended plan. The extension would cover an area of approximately 3.6 hectares (8.8 acres) at the terminus of the GHC.

The Area of Potential Effect (APE) includes all areas of proposed dredging to portions of the GHC and the use of the existing Pelican Island Placement Area. The APE consists of dredging the current channel and extension to a depth of 46 feet (51 feet with advanced maintenance and allowable over-depth), maintaining an existing bottom width of 1,075 feet and a top width of 1,085 feet. There are currently no plans for

federal real estate acquisition. All newly proposed construction within the proposed APE is located entirely on submerged lands.

There are no previously recorded cultural resources within the APE. Based on the prior consultation with your office, the USACE does not recommend an investigation of the existing channel and the Pelican Island Placement Area. The proposed extension has not been previously surveyed. However, the extension is a relatively small area. The development of adjacent port facilities along both shorelines and the construction of the Pelican Island Bridge and adjacent pipelines would likely produce inaccurate results following a magnetometer survey. Therefore, we do not recommend an archeological survey for the extension.

We request your concurrence with our determination of no effect upon historic properties within the APE in compliance with Section 106 of the NHPA. If cultural resources are discovered during construction activities, the USACE will cease activities in the immediate area and notify your office within 48 hours, in accordance with 36 CFR 800.13. If you have any questions or need additional information concerning this project, please contact John A. Campbell, Archeologist, Environmental Branch, Regional Planning and Environmental Center, at (409) 766-3878 or john.a.campbell@usace.army.mil.

Sincerely,

Jeffrey Pinsky

Jeffrey F. Pinsky
Chief, Environmental Branch
Regional Planning and Environmental Center

Enclosure

This Correspondence sent to john.a.campbell@usace.army.mil on 05-11-2022

TEXAS HISTORICAL COMMISSION
real places telling real stories

Re: Project Review under Section 106 of the National Historic Preservation Act and/or the Antiquities Code of Texas
THC Tracking #202209165
Date: 05/11/2022
Galveston Harbor Channel Extension
Port of Galveston
Galveston,TX

Description: Deepening and extension of the Galveston Harbor Channel. See attached consultation letter, project area maps, and prior consultation with the Texas SHPO.

Dear John A. Campbell:
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

- No identified underwater archeological sites, historic shipwrecks, and/or significant remote-sensing targets present or affected. However, if buried cultural materials are encountered during project activities, work should cease in the immediate area; work can continue where no cultural materials are present. Please contact the THC's Archeology Division at 512-463-6096 to consult on further actions that may be necessary to protect the cultural remains.
- THC/SHPO concurs with information provided for the underwater project area.

We have the following comments: A review of historical Galveston coastal charts demonstrates that water depths in the proposed project area were universally 8 Â½ to 9 ft. in 1898, 1899, and 1901. By 1905 deepening had already commenced to depths of 20 ft. in the southern section of the project area. By 1915 the project area was 40 ft. deep. Based on early 19th-century channel modifications, the proposed construction should not adversely affect submerged historic resources within the Area of Potential Effect. In the case of an unanticipated discovery, halt work at that location and contact the Texas Historical Commission.

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

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Texas Coastal and Central Plains Ecological Services Office
Houston Sub-Office
17629 El Camino Real, Suite 211
Houston, Texas 77058
PHONE: 281/286-8282
FAX: 281/488-5882

In Reply Refer To:
2022-0034255

July 17, 2024

Mr. Justin Tirpak
Regional Planning and Environmental Center
U.S. Army Corps of Engineers
Galveston District Office
P.O. Box 1229
Galveston Texas 77553-1229

Dear Mr. Tirpak:

This letter is in response to the U.S. Army Corps of Engineer's (Corps) request for informal consultation on Galveston Harbor Channel Extension Feasibility Study (GHCE) in Galveston County, Texas. This request, initiated on January 22, 2024, with revisions on May 24, 2024, is associated with the Supplemental Biological Assessment (SBA) for the *USFWS Biological Assessment for the Galveston Harbor Channel Extension Feasibility Study, Galveston County, Texas* dated June 2022, submitted under the U.S. Fish and Wildlife Service (Service) administrative record for consultation 2022-0034255. The intent of the SBA is to provide updates on the effects of the modified project on species identified in the original Biological Assessment (BA) and any species which have been listed since then.

The original authorized project consists of deepening the existing channel from -41 feet Mean Lower Low Water (MLLW) to -46 feet MLLW, plus three feet of advanced maintenance and two feet of allowable over depth, such that the maximum channel depth following periodic maintenance will not exceed -50 feet MLLW. Channel deepening would begin near Port of Galveston Pier 38 at Station 20+000, continue westward towards Pelican Island Bridge and end at Station 22+571 for approximately 2,571 feet as described in the original BA (Figure 2) and in the SBA (Figure 4). The modified project detailed in the SBA includes an extension of the authorized channel to be deepened to -46 feet at MLLW between stations 22+571 and 23+076 for 505 feet, plus four feet of advanced maintenance and one foot of allowable over depth. The modified project does not include any channel widening, so the bottom width will remain at 1,075 feet or less and the channel top-of-cut will remain consistent with the template of the existing project. The total project including the originally authorized channel deepening plus

additional channel deepening will generate 713,200 cubic yards (cy) of new dredge material, and take approximately three months to complete, with 43 days of active dredging. Maintenance dredging of the authorized channel and channel extension will be required every four years and generate approximately 196,000 cy of material, which could be placed in the Pelican Island Placement Area (PA), a 1,100-acre upland site located approximately 1.25 miles north of the channel, or alternatively at the Galveston Ocean Dredged Material Disposal Site. Raising the levees around the Pelican Island PA site to accommodate new work material was authorized under a separate federal action and therefore not included in this consultation. However, the Pelican Island PA site was reviewed by the Corps and determined not to contain suitable wetland habitat for Eastern Black Rail (*Laterallus jamaicensis ssp. jamaicensis*) due to the frequency of placement activities and recent construction in this area.

The Corps is requesting concurrence with its determination that the proposed project **may affect but is not likely to adversely affect** the West Indian manatee (*Trichechus manatus*), pursuant to the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). Section 7 of the Act requires that all Federal agencies consult with the Service to ensure that the actions authorized, funded, or carried out by such agencies do not jeopardize the continued existence of any threatened or endangered species or adversely modify or destroy designated critical habitat of such species.

The Service concurs that the proposed project may affect but is not likely to adversely affect the federally listed West Indian manatee, since the effects are insignificant or discountable. This concurrence is based upon a review of Service files and the implementation of the following agreed upon conservation measures to reduce potential effects down to insignificant and/or discountable levels:

1. The Federal Action Agency shall ensure the Resident Engineers (RE) and/or a biological monitor are trained on manatee identification and behaviors. The RE/biological monitor will have stop work authority and will monitor for the presence of manatee(s) during any project phase involving open water work. All on-site project personnel are responsible for observing water-related activities for the presence of manatee(s) and notifying the RE/biological monitor, if spotted. The RE and/or biological monitor will be onsite during any construction activities for the entire project period.
2. Training will include but is not limited to manatee training materials and videos found at https://www.youtube.com/watch?v=Xs7zLRtZVOQ and Manatee and Other Marine Animal Watch Information web sites [Florida Fish and Wildlife Conservation Commission web site at https://myfwc.com/wildlifehabitats/wildlife/manatee/].
3. Before activities occur in open water areas, a 50-foot radius of the work area should be delineated. If a manatee(s) is observed within the 50-foot radius, the RE/biological monitor shall halt all in-water operations, including vessels. Activities shall not resume until the manatee(s) has moved beyond the 50-foot radius of the project operation, or until 30 minutes' elapses if the manatee(s) has not reappeared within 50 feet of the operation. Animals must not be herded away or harassed into leaving. If a manatee is sighted within 100 yards of the active work zone, vessels will operate at no wake/idle speeds.

4. All personnel associated with the project shall be instructed daily about the presence of manatees, manatee speed zones, and the need to avoid collisions with and injury to manatees.
5. All vessels associated with the construction project shall operate at "Idle Speed/No Wake" at all times while in the immediate area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.
6. Temporary signs concerning manatees shall be posted prior to and during all in- water project activities. All signs are to be removed by the permittee upon completion of the project.
7. Temporary signs should be place in a manner visible to construction crews and the size should be minimum of 12 inches by 15 inches and individual letter size a minimum of 2 inches. These types of signs must be posted: One sign which reads “CAUTION BOATERS: MANATEE AREA”, a second sign explaining the requirements for "IDLE SPEED/NO WAKE" and a third sign explaining the shutdown requirements by stating “CAUTION: MANATEE AREA/ EQUIPMENT MUST BE SHUTDOWN IMMEDIATELY IF A MANATEE COMES WITHIN 50 FEET OF OPERATION”. Several signs will be placed throughout the project area depending upon the size of the construction work zone.
8. Siltation or turbidity barriers shall be made of material in which manatees cannot become entangled, shall be properly secured, and shall be regularly monitored throughout the day to avoid manatee entanglement or entrapment.
9. Any manatee sightings, collision with, or injury to a manatee shall be reported immediately to the Texas Marine Mammal Stranding Network Hotline at 1-800-9-MAMMAL and the Texas Coastal and Central Plains Ecological Service Field Office at 281-286-8282, extension 26504. Please provide the nature of the call (i.e., report of an incident, manatee sighting, etc.); time of incident or sighting; and the approximate location, including the latitude and longitude coordinates, if possible.

The Corps determined that the proposed action will have **no effect** on the Attwater’s Greater Prairie Chicken (*Tympanuchus cupido attwateri*), Piping Plover (*Charadrius melodus*), Rufa Red Knot (*Calidris canutus rufa*), Eastern Black Rail (*Laterallus jamaicensis ssp, jamaicensis*), Whooping Crane (*Grus americana*), Monarch Butterfly (*Danaus plexippus*), Green Sea Turtle (*Chelonia mydas*), Hawksbill Sea Turtle (*Eretmochelys imbricata*), Kemp’s Ridley Sea Turtle (*Lepidochelys kempii*), Leatherback Sea Turtle (Dermochelys coriacea), and Loggerhead Sea Turtle (*Caretta caretta*). The Service does not provide concurrences with no effect determinations, but by making a determination, we believe the Corps has complied with Section 7(a)(2) of the Act for those species.

In the event the project changes or additional information on listed or proposed listed species becomes available, the project should be reanalyzed for effects not previously considered. Our response is provided in accordance with provisions of the Act of 1973 (16 U.S.C. 1513 et seq.). Please refer to the Service consultation number 2022-0034255 in future correspondence. If you need further guidance or have any questions concerning this letter, please contact Dr. Jan Culbertson at 281-286-8282 or jan_culbertson@fws.gov.

Sincerely,

CHARLES ARDIZZONE

Digitally signed by CHARLES ARDIZZONE
Date: 2024.07.17 10:27:27 -05'00'

Charles Ardizzone
Field Supervisor

Appendix D-5

2018 Final Statement of Findings and Finding of No Significant Impact for Galveston Harbor Channel Extension Post-Authorization Change Report (weblink)

HGNC Galveston Channel Extension
Galveston, Galveston County, Texas
Draft Validation Report

March 2024

US Army Corps of Engineers
Galveston District

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Bellow is a web link to the Galveston Harbor Channel Extension 2016 Final Environmental Assessment and 2018 FONSI

https://www.swg.usace.army.mil/Portals/26/Projects/Navigation/Houston%20Galveston%20Navigation%20Channel,%20Galveston%20Harbor%20Channel%20Extension/Feasibility%20Study%20-%20Final/2016%20Final%20Environmental%20Assessment%20&%202018%20Finding%20of%20No%20Significant%20Impact.pdf

Appendix D-6 Public Involvement

HGNC Galveston Channel Extension
Galveston, Galveston County, Texas
Draft Validation Report

March 2024

US Army Corps of Engineers
Galveston District

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DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

January 22, 2024

PUBLIC NOTICE

DRAFT SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT, GALVESTON HARBOR CHANNEL EXTENSION, GALVESTON COUNTY, TEXAS

The U.S. Army Corps of Engineers Galveston District (USACE) announces the release of the Draft Supplemental Environmental Assessment (SEA) and Finding of No Significant Impact (FONSI) for the Galveston Harbor Channel (GHC) Extension (GHCE) in Galveston County, Texas. The GHC is adjacent to the Houston Ship Channel in Galveston, Texas.

In 2016, the USACE signed a FONSI and published a Final EA for the recommended plan (RP) authorized by Congress. The RP involved deepening 2,571 feet of the GHC to a depth of -46 feet, beginning near the Port of Galveston Pier 38 at Station 20+000, continuing westward towards Pelican Island Bridge, and ending at Station 22+571. Approximately 609,500 cubic yards (cy) of dredged material would be placed in the existing Pelican Island Placement Area (PA). In 2021, the GHCE moved into the pre-construction, engineering, and design (PED) phase, when the design team identified revisions needed for the RP. As a result, additional channel at the most western end of the GHC has been incorporated into the design and extends the -46-foot MLLW deepening an additional 505 feet. In addition, updated geotechnical surveys determined that the amount of sediment that needs to be dredged is less than projected, approximately 600,500 cubic yards total, resulting in a net decrease in sediment dredged and a shorter construction duration (about one month). The SEA documents the impacts of the Proposed Modified RP. The SEA and draft FONSI are available for download at the Galveston District website:

https://www.swg.usace.army.mil/Projects/Houston-Galveston-Navigation-Channel-Galveston-Harbor-Channel-Extension/

The USACE solicits comments from the public, Federal, State, and local agencies and officials, Indian tribes, and other interested parties. The USACE will accept written public comments on the Draft SEA and FONSI for a 30-day comment period starting Monday, January 22nd, 2024. Comments must be postmarked by February 24nd, 2024.You may mail comments to USACE, Galveston District, Attn: Justin Tirpak, RPEC-ENV, 2000 Fort Point Road, Galveston, TX 77550, or you may email comments to Justin.M.Tirpak@usace.army.mil.

Brandon Wadlington

Brandon Wadlington
Chief, NEPA & Natural Resources Section
Regional Planning and Environmental Center

REGION 6
DALLAS, TX 75270

February 16, 2024

VIA Electronic Mail

Ms. Gretchen Brown
U.S. Army Corps of Engineers (USACE)
Galveston District
2000 Fort Point Road
P.O. Box 1229
Galveston, Texas 77550
gretchen.s.brown@usace.army.mil

Re: Galveston Harbor Channel Extension Project Draft Supplemental Environmental Assessment (SEA) and Finding of No Significant Impact (FONSI)

Dear Ms. Brown:

The U.S. Environmental Protection Agency (EPA), Region 6, has reviewed the USACE Galveston Harbor Channel Extension (GHCE) project Draft SEA and FONSI. The project will deepen the Galveston Harbor Channel portion of the Houston Galveston Navigation Channel (HGNC) project. The project will improve navigation safety and operating efficiencies while reducing delays and is expected to contribute to the economic efficiency of commercial navigation in the region. Dredge material placement is planned for the existing Pelican Island Placement Area. The Draft SEA was reviewed pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500 – 1508), and EPA's authority under Section 309 of the Clean Air Act.

The following comments are offered for consideration in finalizing the SEA and FONSI:

Section 404 Clean Water Act Comment

The quantity of dredged material has decreased significantly under the revised disposal plan with no additional wetland impacts. With regard to Section 404 of the Clean Water Act, EPA has no additional comments to provide on the Draft SEA.

Environmental Justice (EJ) Analysis

In Section 3.6.1 of the document, the USACE stated, "The project area is within the Census Block group 48167724001, which has a population of 1,036 people and an area of 21.36 square miles (mi2) (7.09 mi2 land and 14.27 mi2 water). Of the 1,036 people, 879 people (85%) are reporting as white, 55

people (5%) are reporting as black, 75 people (7%) are reporting as Asian, 7 people (1%) are reporting as Other Race, and 20 people (2%) are reporting two or more races, with no individuals reporting as American Indian or Pacific Islander. A total of 299 individuals (29%) are reporting as Hispanic."

EPA recommends the USACE revisit this Section. The population percentage provided exceeds 100%. The Block group would not be considered an EJ area, if the percentage of Hispanic is deducted from the 85 % White population and the percentages are accurate. Although the area did not meet the Corps' Criteria for EJ based on minority population, it was identified as an EJ area due to the percentage of the low-income population.

The USACE states in the Appendix D, that this resolution authorized a review of previous reports on the Houston Ship Channel (HSC), Galveston Harbor Channel (GHC), and the Texas City Channel. The review was completed in January 1980 and demonstrated that channel modifications necessary to improve the efficiency and safety of Galveston Bay channels were feasible and recommended that studies continue into the feasibility phase. Each of the channels at the time of review were authorized to -37 feet MLLW. Deepening of the HSC portion to 46 feet was completed in 2005. Deepening of the GHC did not proceed at that time due to lack of funds.

In Chapter 4, the USACE states that the proposed project would not have a disproportionate adverse impact on minority or low-income population groups within the project area. However, since contaminated dredge material placement has been an issue on some of the related HSC Project segments, EPA recommends any concerns raised regarding dredge material placement at the Pelican Island Placement area and impacting EJ populations be addressed and mitigation measures put into place as necessary. EPA also recommends the USACE continue to execute meaningfully engagement with EJ communities and tribal consultation where contaminated dredge material will be disposed. Mitigation measures for potential migration of hazardous contaminates into the environment should also be addressed and applied as warranted.

EPA appreciates the opportunity to review the Draft SEA and FONSI. We look forward to the receipt of the Final SEA and FONSI. If you have any questions regarding our comments, please contact Michael Jansky, the lead reviewer, at jansky.michael@epa.gov or 214-665-7451.

Sincerely,

Robert Houston

Digitally signed by Robert Houston
Date: 2024.02.16 13:31:25 -06'00'

Robert Houston
Staff Director
Office of Communities, Tribes and Environmental Assessment

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William "Leslie" Doggett
Houston

Paul L. Foster
El Paso

Anna B. Galo
Laredo

Robert L. "Bobby" Patton, Jr.
Fort Worth

Travis B. "Blake" Rowling
Dallas

Lee M. Bass
Chairman-Emeritus
Fort Worth

T. Dan Friedkin
Chairman-Emeritus
Houston

David Yoskowitz, Ph.D.
Executive Director

February 23, 2024

Justin Tirpak, Biologist
Regional Planning and Environmental Center
U.S. Army Corps of Engineers
2000 Fort Point Road
Galveston, Texas 77550

Re: Draft Supplemental Environmental Assessment (SEA) and Finding of No Significant Impact (FONSI) for the Galveston Harbor Channel (GHC) Extension (GHCE) in Galveston County, Texas.

Dear Mr. Tirpak:

Texas Parks and Wildlife Department (TPWD) has reviewed the Draft Supplemental Environmental Assessment (SEA) and Finding No Significant Impact (FONSI) for design modifications of the Galveston Harbor Channel Extension (GHCE) project in Galveston, County, Texas.

By letter dated June 10, 2013, TPWD outlined the importance of using dredged material beneficially and recommended that all alternatives to using dredged material beneficially be thoroughly explored. Although the Draft SEA dated July 2023 identifies beneficial use alternatives, it states "...that it would be more cost effective to pump the material to Pelican Island PA than to construct an open water marsh, unless USACE could feasibly cost share marsh creation with the local sponsor or other interested entity." However, the extent to which cost sharing opportunities have been explored is unclear.

> **Recommendation:** Prior to finalizing the SEA and FONSI, USACE should identify and contact local restoration practitioners, including governmental agencies and non-governmental organizations, to identify potential cost-sharing partners for the beneficial use of this dredged material. The outcome of this effort should be included in the final SEA.

TPWD appreciates the opportunity to participate in the planning of the GHCE project. Questions can be directed to Ms. Elena Flores in Dickinson, Texas by email (elena.flores@tpwd.texas.gov) or phone (832-492-3940).

Sincerely,

Emma Clarkson, PhD.
Program Director, Ecosystem Resources Program
Coastal Fisheries Division

EC:EF

4200 SMITH SCHOOL ROAD
AUSTIN, TEXAS 78744-3291
512.389.4800
www.tpwd.texas.gov

Appendix D-7 Finding of No Significant Impact (FONSI)

HGNC Galveston Channel Extension
Galveston, Galveston County, Texas
Draft Validation Report

July 2024

US Army Corps of Engineers
Galveston District

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FINDING OF NO SIGNIFICANT IMPACT
HGNC Galveston Harbor Channel Extension
Galveston, Galveston County, Texas

The U.S. Army Corps of Engineers, Galveston District (Corps) has conducted an environmental analysis in accordance with the National Environmental Policy Act of 1969, as amended. The final Integrated Feasibility Report and Supplemental Environmental Assessment (SEA) dated (*expected later in 20204*) for the Galveston Harbor Channel Extension addresses concerns about channel inefficiency and safety at the far western end of the Galveston channel.

The SEA, incorporated herein by reference, evaluated various alternatives that would increase safety and efficiency of navigation in the study area. The recommended plan is the National Economic Development (NED) Plan and includes:

- Additional channel was incorporated into the design between stations 22+571 and 23+076.
- The additional channel would involve an additional 505 feet of channel from the existing bay bottom to a depth of -46 feet, plus four feet of advanced maintenance and one foot of allowable overdepth.
- The channel bottom width would vary between 385 feet and 738.5 feet. A cutterhead, hydraulic pipeline dredge would be used to remove all material.
- The additional channel is expected to generate approximately 143,082 cy of new work material.
- New work and maintenance material would be placed into the Pelican Island PA. Construction of the additional channel is expected to add an estimated 14 days to the total construction duration.

In addition to a “no action” plan, one alternative was evaluated. The alternative included is the proposed modified plan. This consist of adding an additional 505 feet to the 2,571 authorized plan as defined in the 2017 Galveston Harbor Channel Extension Chiefs Report. During the 2017 study there were four alternatives considered in addition to the No-Action plan. The other alternatives evaluated were the Non-Structural Alternatives, Structural Alternatives, Dredge Material Placements, and the Screening of Channel and Placement alternatives.

For all alternatives, the potential effects were evaluated, as appropriate. A summary assessment of the potential effects of the recommended plan are listed in Table 1:

Table 1: Summary of Potential Effects of the Recommended Plan

	Insignificant effects	Insignificant effects as a result of mitigation*	Resource unaffected by action
Aesthetics	☐	☐	☒
Air quality	☒	☐	☐
Aquatic resources/wetlands	☐	☐	☒
Invasive species	☐	☐	☒
Fish and wildlife habitat	☒	☐	☐
Threatened/Endangered species/critical habitat	☒	☐	☐
Historic properties	☐	☐	☒
Other cultural resources	☐	☐	☒
Floodplains	☐	☐	☒
Hazardous, toxic & radioactive waste	☐	☐	☒
Hydrology	☐	☐	☒
Land use	☐	☐	☒
Navigation	☒	☐	☐
Noise levels	☒	☐	☐
Public infrastructure	☐	☐	☒
Socio-economics	☒	☐	☐
Environmental justice	☒	☐	☐
Soils	☐	☐	☒
Tribal trust resources	☐	☐	☒
Water quality	☒	☐	☐
Climate change	☒	☐	☐

All practicable and appropriate means to avoid or minimize adverse environmental effects were analyzed and incorporated into the recommended plan. Best management practices (BMPs) as detailed in the SEA will be implemented, if appropriate, to minimize impacts. BMPs and conservation measures included in the project design are utilizing existing accesses and channels to the greatest extent practicable, employing construction BMPs, and utilizing the smallest construction footprint possible.

No compensatory mitigation is required as part of the recommended plan.

Public review of the draft SEA and FONSI was completed on 24 February 2024. All comments submitted during the public review period were responded to in the Final SEA and FONSI. A 30-day state and agency review of the Final SEA was completed on 24 February 2024. As a result of state and agency review, the final IFR/EA was updated to include a more complete environmental justice analysis using the Climate and Economic Justice Screening Tool (CEJST) as well as incorporating new information in the effects analysis for endangered species .

Pursuant to section 7 of the Endangered Species Act of 1973, as amended, the U.S. Army Corps of Engineers determined that the recommended plan may affect but is not likely to adversely affect the following federally listed species or their designated critical habitat: West

Indian Manatee, Green Sea turtle, Kemps Ridley Sea turtle, and Logger Head Sea turtle. The National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (FWS) concurred with the Corps' determination on (*expected later in 20204*).

Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, the U.S. Army Corps of Engineers determined that the recommended plan has no effect on historic properties.

Pursuant to the Clean Water Act of 1972, as amended, the discharge of dredged or fill material associated with the recommended plan has been found to be compliant with section 404(b)(1) Guidelines (40 CFR 230). The Clean Water Act Section 404(b)(1) Guidelines evaluation is found in Appendix D-4 of the SEA.

A water quality certification pursuant to section 401 of the Clean Water Act was obtained from the Texas Commission on Environmental Quality (TCEQ). All conditions of the water quality certification shall be implemented in order to minimize adverse impacts to water quality. Project modifications do not reach the threshold for requiring new consultation, the 2017 certification remains in effect and will be followed.

A determination of consistency with the Galveston County, Texas Coastal Zone Management program pursuant to the Coastal Zone Management Act of 1972 was obtained from the General Land Office (GLO). All conditions of the consistency determination shall be implemented in order to minimize adverse impacts to the coastal zone. Project modifications do not reach the threshold for requiring new consistency determination, the 2017 approval remains in effect and will be followed.

All applicable environmental laws have been considered and coordination with appropriate agencies and officials has been completed.

Technical, environmental, and economic criteria used in the formulation of alternative plans were those specified in the Water Resources Council's 1983 Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies. All applicable laws, executive orders, regulations, and local government plans were considered in evaluation of alternatives. Based on this report, the reviews by other Federal, State and local agencies, Tribes, input of the public, and the review by my staff, it is my determination that the recommended plan would not cause significant adverse effects on the quality of the human environment; therefore, preparation of an Environmental Impact Statement is not required.

_____
Date

_____
Rhett Blackmon
Colonel, Corps of Engineers
District Commander