

**Mobile Harbor, Mobile, Alabama
Integrated General Reevaluation Report with
Supplemental Environmental Impact Statement**

ERRATA

August 14, 2019

Main Report, Executive Summary (Page ES-7)

Replace second sentence of first paragraph with: *The EPA, Region 4, is designating the modified ODMDS pursuant to Section 102 of MPRSA.*

Main Report, Executive Summary (Page ES-7)

Revise second sentence of the second paragraph to: *The study assumes that new work material associated with the RP would be similar to that already tested and should be suitable for placement pursuant to the Marine Protection, Research, and Sanctuaries Act of 1972 MPRSA and the Clean Water Act.*

Main Report, Executive Summary (Page ES-9)

Delete *EPA Certification of the Proposed Expansion to the ODMDS*. Replace with: *EPA Designation of the Proposed Expansion to the ODMDS*.

Main Report, Section 2.3.9.2, Underkeel Clearance (Page 2-25)

Starting with the second line on the page 2-25, replace remainder of paragraph with:

ft, however, few have sailings drafts of 42 to 44 ft. Bulk vessels drafting 45 feet at the dock, would draft deeper when underway. The Mobile Bay Ship Channel allows for two feet of advanced maintenance and two feet of allowable over depth. ER 1105-2-100 states that for cases where it is determined that encroachment in the safety zone is taking place, risk accepting behavior may be assumed. Docks that tankers and general cargo vessels call are upriver where the channel converts to 40 ft deep. Sailing drafts for tankers and general cargo vessels are up to 40 ft deep.

Main Report, Table 2-18 (Page 2-38)

For the April 1990 to September 1999 period, replace the cy/yr volume in the third column with: 356,000.

Main Report, Table 2-31 (Page 2-91)

Revise Loggerhead Sea Turtle Scientific name as “*Caretta caretta*”

Main Report, Section 3.3.1.1 Screening of Initial Alternatives 2.1.1.2 (Page 3-6)

Add at the end of the first full paragraph:

Additional details of the need to modify the Choctaw Pass Turning Basin can found in Section 4.1.1.

Main Report, Section 4.1 (Page 4-1)

After Section 4.1, add Section 4.1.1, Choctaw Pass Turning Basin to read:

A feasibility level screening ship simulation was conducted on the Choctaw Pass Turning Basin, located at the northern most part of the Bay Channel in 2017 to assess the turning basin dimensions as described in Section 6.5 and detailed in Attachment A – 3. During the study the bar pilots had indicted concern about the turning basin configuration and suggested improvements such as extending the turning basin to the south to accommodate the turning of larger vessels, with lengths of approximately 1,000 feet or greater. Vessels of these dimensions are currently turned on an infrequent basis (approximately 3 per month). When turning they require tug assistance (using at least two tugs), slack tides, mild wind conditions and use of areas outside of the authorized channel. This was confirmed with automatic identification system (AIS) data and through ship simulations for the current design vessel (1,100 feet long).

As discussed in the Engineering Appendix Section 6.5 Ship Simulations feasibility level analysis confirmed that turning basin should be elongated along the prevailing current to provide sufficient room for safe turning of the design vessel. Given time restrains simulations were limited to a 100-foot expansion along the southern boundary and were incorporated into the simulations utilizing a flat bottom instead of actual bathymetry. While this extension greatly assisted in the safety of completing the turn with the Humber Bridge by allowing for more room for the falling bow, pilots still had to use more of the engine’s power than they would typically be comfortable with; as such, further improvements beyond the 100 feet may be required.

For the GRR the extension of the turning basin was laid out with a minimum turning diameter of 1.5 times the design vessel of maximum length (i.e. 1,100 feet, 158 feet, and 50.8) in the direction of prevailing currents in accordance with EM 1110-2-1613 Hydraulic Design of Deep Draft Navigation Projects. As with the widening for one- and two-way traffic, additional ship simulations are recommended during the PED to optimize and confirm the design dimensions.

Main Report, Section 4.2.1.2 (Page 4-10)

Replace the last sentence of Section with:

The suitability of this material will be further investigated during the PED Phase of this project.

Main Report, Section 4.2.3.4 (Page 4-25)

Add the following paragraph at the end of the section:

During agency and public comment review of the Final Mobile Harbor GRR Report, requests for additional consideration of dredged material for beneficial use purposes were received. As part of this study, the USACE will provide a minimum of 1.5MCY (total) of suitable new work dredged material for beneficial use projects that have been approved and permitted by the proponents through the RESTORE, NRDA, or NFWF programs. Projects that could fall under the authority of Section 302 of WRDA 1996 include, but are not necessarily limited to, the following:

- 1.) Deer River Shoreline Restoration Project (NEP)*
- 2.) Dauphin Island Causeway Shoreline Restoration (Mobile County)*
- 3.) Denton Reef Restoration (ADCNR-AMR)*

A request to use new work dredged material for restoration of the shoreline at the former MAWSS Sewer Plant Property located north of Helen Wood Park was also received during the final agency and public comment review. This request will be evaluated to determine the availability of suitable material within the channel and whether the placement will fall under the authority of Section 302 of WRDA 1996.

Main Report, Table 4-7 (Page 4-24)

Replace right column header with: *Incremental Cost per CY for BU Placement*

Main Report, Section 5.4.4.2.1 (Page 5-11)

Replace third sentence of second paragraph with: *Therefore, the determination was made that there is an acceptable risk that only minimally detectable levels of some contaminants could be encountered and that sediment testing during PED should proceed.*

Main Report, Section 5.4.4.2.1 (Page 5-11)

Replace the last paragraph on the page with: *At this time, specific impacts associated with the new work sediment testing and evaluation during the PED phase of the study are not known. Based upon historical testing of new work and O&M material, all current qualitative presumptions are that the new work material associated with project sampling would be similar to that already tested and should be suitable for placement within the identified placement areas. Based upon existing sediment knowledge, material within the Mobile River typically consists of deltaic sands, silty sand, silts and clayey silts and transitions in the lower bay to primarily estuarine silty clay and clay. The western shoreline exhibits sands which grade to clayey sand, sandy clays, and clays towards the deeper parts of the bay. Oyster reefs and shell occur in isolated locations in the southern part of Mobile and Bon Secour Bays (USACE 1985). The upper portion of Mobile Harbor is predominantly silt and clay with higher concentrations of sand in the mouth of the Mobile River. The northernmost part of the harbor and Mobile River mouth, which reflects the conditions within the turning basin area is sandier due to the larger grain sizes initially deposited into the estuary by the mouth of the river while the finer silts and clays were deposited in the deeper portions of the harbor area. However, testing is still required to ensure compliance with the MPRSA and CWA material suitability determinations. Based on the results of new sediment testing for the turning basin and LRR, presented in Section 2.3.4, it is anticipated that minimally detectable levels of some contaminants could be encountered. The final determination on whether the new work material meets the ODMDS placement criteria will be the responsibility of the USACE and EPA in accordance with Section 103 of the MPRSA.*

Main Report, Section 5.5.4.2.1 (Page 5-16)

Delete last two sentences of the first paragraph of the section.

Main Report, Section 5.6.2.1 (Page 5-19)

Replace the last sentence of the first paragraph with:

The detailed report, “Mobile Harbor Channel Deepening, Groundwater Evaluation”, dated April 2019, discussing the model development, calibration, and findings is in Attachment A – 7, Appendix A.

Main Report, Section 5.6.2.1 (Page 5-19)

Delete the penultimate sentence in paragraph 2.

Main Report, Section 5.6.2.1 (Page 5-19) and Appendix A, Engineering, Section 6.6 (Page 6-17)

Insert the following after paragraph 2:

The USACE, Mobile District met with representatives of the Dauphin Island Water and Sewer Authority on May 7, 2019, to discuss the findings in the USACE “Mobile Harbor Channel Deepening, Groundwater Evaluation” dated April 2019. After the May 2019 meeting and reviewing the modeling report, Dauphin Island provided a response letter dated June 3, 2019, which outlined their general concerns about the adverse impact the channel deepening may have on their drinking water quality. As stated in the USACE modeling report, uncertainty exists in the model related to factors such as geology, pumping and sea level rise. The USACE utilized numerous publically available reports, studies and data sources to construct and calibrate the groundwater flow model. To date, no specific changes to the model input parameters have been provided by Dauphin Island (e.g. pumping rates, pumping locations, geologic conceptualization, etc.) and as such, no revisions to the model are planned. The USACE does recognize that changes to the salinity level in the Dauphin Island drinking water could result in public health impacts as stated in the June 2019 letter. However, differentiation between the existing saltwater encroachment due to the Dauphin Island pumping and any potential changes resulting from the deepening would require extensive monitoring of both water levels and salinity in the drinking water aquifers. Dauphin Island would also need to provide any historic water level and salinity data from the wells on the island to further the current evaluation.

The current water treatment plant at Dauphin Island consists of a two-rack reverse osmosis (brackish water) system and is sized to accommodate a future rack of reverse osmosis membranes. With the present quality of raw aquifer water not changing, the addition of a third rack could increase the produced potable water capacity by at least 50%. Furthermore, upgrading the “brackish” water membranes to “sea water” membranes will allow a reduction in the current reject rate used by the D.I. Water Authority to produce more potable water with the same current raw water well production. This upgrade also provides a greater concentration of minerals in the reject water which allows more of the raw water recovery for drinking water purposes.

The addition of one new saltwater RO membrane along with the exchange of one brackish membrane to a saltwater membrane provides a more practical solution at a cost of about \$1.8 M when compared to the level of monitoring and additional assessment required to address the concerns of the Dauphin Island Water and Sewer Authority, especially when residual life safety risks are considered. Although the results of the analysis using the data currently available to the USACE does not indicate an adverse impact to the Dauphin Island water supply as a result of the channel

modifications, replacement of the secondary brackish water treatment array with two saltwater RO arrays provides a more prudent investment and will be accomplished by the Non-Federal sponsor in accordance with guidance set forth in ER 405-1-12 Real Estate Roles and Responsibilities for Civil Works. Detailed design of, or alternatives to, the proposed system will be developed during the Preconstruction, Engineering, and Design Phase of the project.

Main Report, Section 5.7.3 (Page 5-28)

Replace the penultimate paragraph of the section with:

The proposed modification is currently awaiting the EPA rule making process and anticipated to be completed prior the release of the Final GRR. Once the modification is approved by the EPA, the ODMDS will provide the capacity necessary for the channel modification.

Main Report, Section 5.8.8.4 (Page 5-50)

Last sentence of Section, delete 2.5.6.1 and replace with 2.5.6.9.

Main Report, Section 5.8.8.6.1 (Page 5-52)

Add the following before the final sentence of the penultimate paragraph of the section:

The simulated DO levels do vary seasonally and do capture low DO events, but DO remained above the threshold that initiated oyster mortality (exposure to DO < 2.4 mg/l for 10,000 consecutive seconds). Modeled DO is similar between Without- and With-Project, so in the event that simulated DO is below the mortality threshold, we expect oyster larvae to experience similar conditions under the Without- and With-Project scenarios. However, there are uncertainties associated with any model prediction and this uncertainty could be masking DO events below the mortality threshold.

Main Report, Section 5.12.2.1 (Page 5-65)

Replace last sentence of first paragraph with:

Compliance with the State of Alabama's water quality standards would be adhered to and water clarity would return to ambient conditions shortly after sediment placement at the dredge and placement sites.

Main Report, Section 5.15.1 (Page 5-70)

Replace the last paragraph of the section with:

Indirect impacts associated with hazardous materials and petroleum products in Mobile Harbor and channel are likely. If the channel is not widened and deepened, less efficient loading and the use of larger vessels would increase the number of vessels calling. Since the new Super Panamax vessels would not be able to load to capacity due to inadequate channel depths, they must be light-loaded in order to transit the channel. An increased number of load restricted vessels would be needed to carry the same amount of cargo, resulting in increased maritime traffic. As a result, amounts of hazardous materials and petroleum products traveling in the channel in the project vicinity would increase, but this increase would be insignificant due to compliance with state and Federal regulations related to the transport and handling of hazardous materials. The amount of associated hazardous and toxic materials travelling by rail and vehicles would be unaffected.

Main Report, Section 5.24.1 (Page 5-89)

Replace the last paragraph of the section with:

Indirect impacts to public and occupational health and safety are possible under the No Action Alternative. If the channel is not widened and deepened, less efficient loading and the use of larger vessels would increase the number of vessels calling. Since the new Super Panamax vessels would not be able to load to capacity due to inadequate channel depths, they must be light-loaded in order to transit the channel. An increased number of load restricted vessels would be needed to carry the same amount of cargo, resulting in increased maritime traffic. Over the long-term, increased maritime traffic may increase the possibility of accidents or the potential for spills of petroleum products in Mobile Bay. However, with compliance with state and Federal regulations related to the transport and handling of hazardous materials, and operating procedures that mitigate navigation risks associated with current channel depths, these impacts would be negligible.

Main Report, Section 5.25 (Page 5-96)

Replace first complete sentence with:

The USACE, Mobile District is currently pursuing certification for the SIBUA and EPA is pursuing designation to expand the ODMDS.

Main Report, Section 6.1.1 (Page 6-4)

Delete the penultimate sentence in second full paragraph.

Main Report, Section 6.2.3 (Page 6-10)

Replace the last sentence of the Section with:

The USACE, Mobile District will pursue CZM specific to the RP from the ADEM as required under the Federal Coastal Zone Management Act (16 U.S.C. 1451 et seq.) during PED.

Main Report, Section 6.2.6 (Page 6-11)

Replace fourth sentence of the paragraph with:

The USACE has completed informal consultation with the USFWS and formal consultation in 2003, 2005 and 2007 with NMFS Fisheries for the GRBO.

Main Report, Section 6.2.10 (Page 6-13)

Replace the last sentence of the Section with:

A Programmatic Agreement between the USACE and the Alabama SHPO has been executed to comply with Section 106 of the NHPA.

Main Report, Table 6-1 (Page 6-16)

Replace the Compliance Status for the Clean Water Act in Table 6-1 with:

Partially Compliant: Section 401 Water Quality Certification will be pursued from the ADEM during PED.

Main Report, Table 6-1 (Page 6-16)

Replace the Compliance Status for the CZMA in Table 6-1 with:

Partially Compliant: Coastal Zone Consistency will be pursued from the ADEM during PED.

Main Report, Table 6-1 (Page 6-17)

Replace the Compliance Status for the NHPA in Table 6-1 with:

Compliant: A Programmatic Agreement between the USACE and the Alabama SHPO has been executed to comply with Section 106 of the NHPA.

Main Report, Section 6.3.6 (Page 6-20)

Delete USGS from list of cooperating agencies.

Main Report, Section 7.0 (Page 7-1)

Delete period before RECOMMENDATION in the header for the Section.

Main Report, Section 7.0 (Page 7-4)

Delete item p.

Appendix A, Engineering, Section 2.10.4.2 (Page 2-25)

Replace reference to Table 5-2 with reference to Table 2-5.

Appendix A, Engineering Section 4.11.1.1 (Page 4-27)

Add the following paragraph after the last paragraph:

Through agency coordination, the EPA requested additional analysis to evaluate and predict the possible movement of material currently existing in the relic shell mined areas due to placement activities associated with this project. The USACE acknowledges this need and will conduct additional surveying and geotechnical analysis, as well as coordination with dredging industry contractors, during PED to refine the exact locations and methods for material placement within the relic shell

mined areas to minimize potential displacement of the existing bottom material. All conditions of the ADEM 401 water quality certification and coastal zone management certification will be adhered to.

Appendix A, Engineering, Section 4.11.1.2 (Page 4-29)

Replace the first paragraph of the section with:

Approximately 18.6 million cubic yards of new work material (24.1 million total volume minus the 5.5 million cubic yards going in the Relic Shell Mined Area) are anticipated to be placed in the expanded ODMDS. The existing approximately 4,000 acre ODMDS was selected by the USACE, Mobile District, under Section 103 of the Marine Protection Research and Sanctuaries Act (MPRSA). The EPA, Region IV is currently designating an expanded site pursuant to Section 102 of the MPRSA which encompasses a portion of the historically used Section 103 ODMDS to accommodate future dredged material placement needs for the Mobile Harbor Federal Navigation Project and this effort is expected to be completed during the PED phase. Additional information and details regarding the ongoing ODMDS coordination is provided in Section 3.7.3 of Appendix C.

Appendix A, Engineering, Attachment A-1

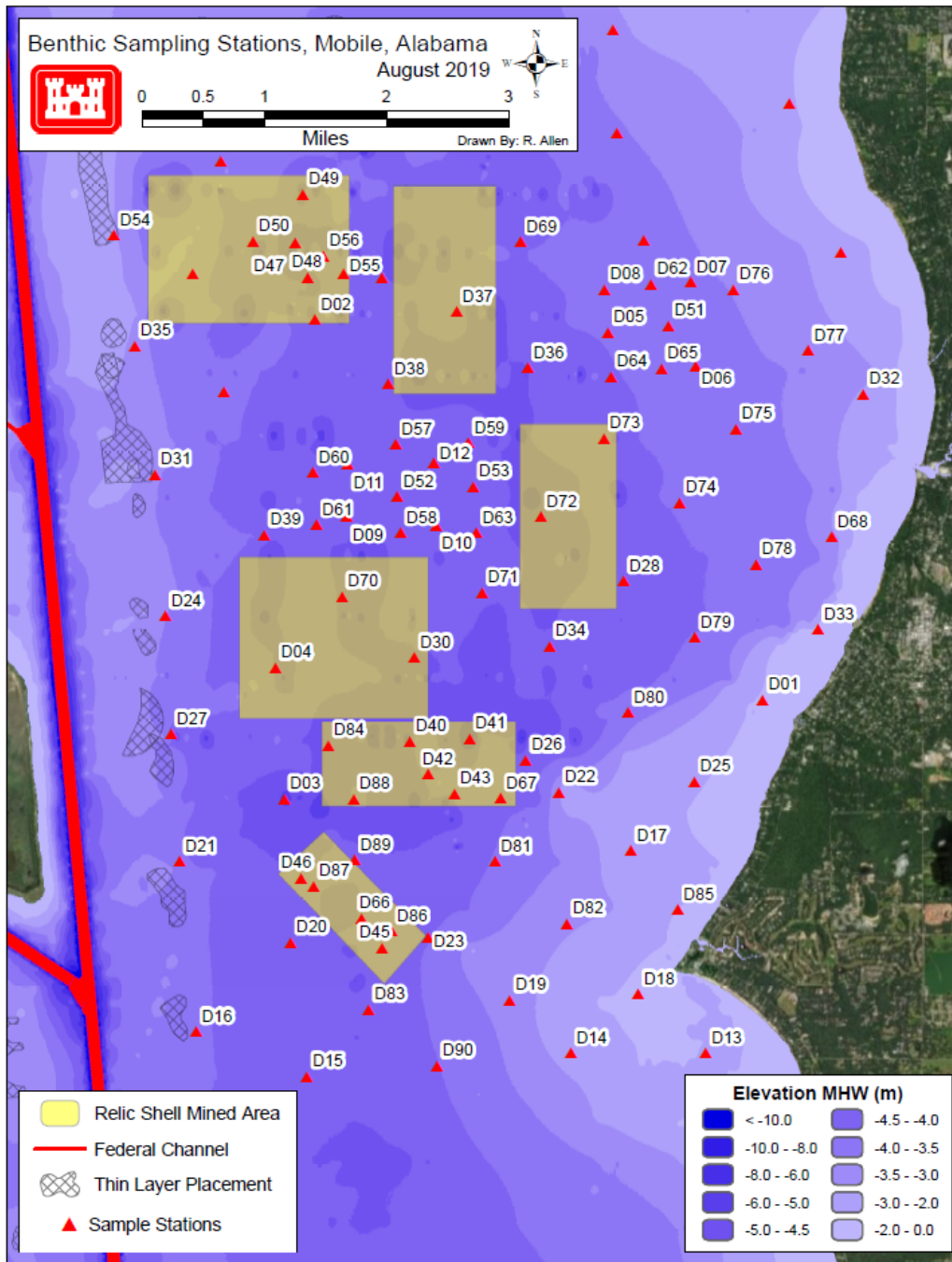
Delete “Draft” from the cover and headers of the ERDC Modeling Report.

Appendix A, Engineering, Attachment A-1

At the end of the Attachment, add the Supplemental information titled “Analysis of the Wilmott’s IA’s and Comparisons Between Predicted Mean and Variance with Observed” included at the back of this document.

Appendix C, Environmental, Figure 2-29 (Page 2-69)

Replace with the figure below:



Appendix C, Environmental, Section 3.7.3 (Page 3-30)

Delete last sentence of second complete paragraph.

Appendix C, Environmental, Section 3.8.9.2.1.1 (Page 3-70)

After the third sentence of the last paragraph of the section insert the following:

The simulated DO levels do vary seasonally and do capture low DO events, but DO remained above the threshold that initiated oyster mortality (exposure to DO <math>< 2.4</math> mg/l for 10,000 consecutive seconds). Modeled DO is similar between Without- and With-Project, so in the event that simulated DO is below the mortality threshold, we expect

oyster larvae to experience similar conditions under the Without- and With-Project scenarios. However, there are uncertainties associated with any model prediction and this uncertainty could be masking DO events below the mortality threshold.

Appendix C, Environmental, Section 3.16.1 (Page 3-88)

Replace the last paragraph of the section with:

Indirect impacts associated with hazardous materials and petroleum products in Mobile Harbor and channel are likely. If the channel is not widened and deepened, less efficient loading and the use of larger vessels would increase the number of vessels calling. Since the new Super Panamax vessels would not be able to load to capacity due to inadequate channel depths, they must be light-loaded in order to transit the channel. An increased number of load restricted vessels would be needed to carry the same amount of cargo, resulting in increased maritime traffic. As a result, amounts of hazardous materials and petroleum products traveling in the channel in the project vicinity would increase, but this increase would be insignificant due to compliance with state and Federal regulations related to the transport and handling of hazardous materials. The amount of associated hazardous and toxic materials travelling by rail and vehicles would be unaffected.

Appendix C, Environmental, Section 3.18.2.1 (Page 3-93)

Replace final sentence of the first paragraph of the ODMDS section with:

EPA Region 4 has prepared an EA, Modification of the Mobile ODMDS, Mobile, Alabama (2018) and will pursue final rule making spring/summer 2020 to modify the existing EPA Section 102 Mobile ODMDS to include a portion of the previously selected USACE Section 103 Mobile North ODMDS.

Appendix C, Environmental, Section 3.25.1 (Page 3-106)

Replace the last paragraph of the section with:

Indirect impacts to public and occupational health and safety are possible under the No Action Alternative. If the channel is not widened and deepened, less efficient loading and the use of larger vessels would increase the number of vessels calling. Since the new Super Panamax vessels would not be able to load to capacity due to inadequate channel depths, they must be light-loaded in order to transit the channel. An increased number of load restricted vessels would be needed to carry the same amount of cargo, resulting in increased maritime traffic. Over the long-term, increased maritime traffic may increase the possibility of accidents or the potential for spills of petroleum products in Mobile Bay. However, with compliance with state and Federal regulations related to

the transport and handling of hazardous materials, and operating procedures that mitigate navigation risks associated with current channel depths, these impacts would be negligible.

Appendix C, Environmental, Section 3.26 (Page 3-110)

Replace the last sentence of Cultural Resources paragraph at the bottom of the page with:

A PA has been executed to guide the completion of the Phase II survey and to mitigate any adverse effects to historic properties if impacts to listed, eligible, or potentially eligible cultural resources cannot be avoided.

Appendix C, Environmental, Section 4.4.4 (Page 4-19)

Add the following paragraph after the last paragraph of the section:

The relic shell mined area was identified for beneficial use of dredged material based upon cooperating agency discussions to restore sediment to the system. Deep holes dredged during mining of relic shell prior to 1982 is documented to have deepened bay bottom in the region as well as possibly contributed to degraded bay bottom characteristics and decreased ecological productivity in the area (May 1971, May 1976, Schroder et. al. 1998, Miller-Way et al. 1995, Reine et al. 2013; Reine et al. 2014, Byrnes et. al. 2013, and Nwokebuihe et al. 2016). Several cooperating agencies identified the area due to its degraded conditions and low dissolved oxygen levels during the summer months. Although not an ecosystem restoration project, the USACE, Mobile District will sample the sites for a minimum of 2 years to assess water quality conditions, sediment composition, and benthic recovery. As with the pre-construction monitoring, the USACE, Mobile District will also coordinate this effort with the state and Federal agencies. Based upon impact findings to aquatic resources, no compensatory mitigation would occur. As such, the relic shell mined site is not intended for compensatory mitigation. However, under its Regional Sediment Management principles, the USACE, Mobile District seeks beneficial use of dredged material in every one of its navigation projects. Beneficial use is often supported by environmental agencies, including EPA, Region IV, due to its potential benefits.

Appendix C, Environmental, Section 4.7.5.3 (Page 4-39)

Replace penultimate sentence in first paragraph of the section with:

Channel widening would result in relatively minor effects of shallow water habitat.

Appendix C, Environmental, Section 4.7.5.3 (Page 4-39)

Delete last sentence of the first paragraph of the section.

Appendix C, Environmental, Section 4.8 (Page 4-56)

Replace last paragraph on the page with the following paragraph:

Under the RP, water quality in the immediate vicinity of the dredging area and open-water placement sites would be temporarily impaired for a short period of time due to an increase in turbidity. The dredging and placement would be controlled and monitored so that none of these operations would cause an increase in turbidity greater than 50 NTUs above background levels outside a 400-ft mixing zone. Adverse effects on biota from changes in water quality would be temporary and localized. No permanent adverse impacts are anticipated.

Appendix C, Environmental, Section 4.6.2 (Page 4-28)

Add **Section 4.6.2.3 Port of Mobile Expansion Projects** with the following:

The Port of Mobile has established a five-phase long-term plan to grow the terminals annual capacity to 1.5 million TEUs. To date, Phases 1 and 2 have been completed which provided an intermodal container transfer facility, along with 20 acres of additional container yard space and installed two new super Post-Panamax cranes to serve new business through the terminal, including containers bound for Walmart's 2.6 million square foot import distribution center. Phase 3 expansion is underway and adds a 400-foot dock extension, super Post-Panamax crane rails and upgrades to the fender system to accommodate 14,000 TEU ships.

Future phased development, as with prior expansions, is market driven. Phases 4 and 5 expansion activities would include developing yard area on an adjacent 35 acres and investing in equipment and automation to increase operational efficiencies and throughput capacity at the terminal.

Appendix C, Environmental, Section 4.7.11 (Page 4-46)

Replace ? in the first sentence of the last paragraph with 3.15.

Appendix C, Environmental, Section 4.8 (Page 4-56)

Delete the penultimate sentence in final paragraph at the bottom of the page.

Appendix C, Environmental, Attachment C-1, Figures 4.3 and 4.3 (Pages 144 and 145)

Delete reference to *Thalassia testinudum*.

Appendix C, Environmental, Attachment C-1, Section 6.3 (Page 200)

Add the following at the bottom of the section:

Our approach utilizing a guild construct to reduce the FAMP dataset containing 160+ species into a limited number of functional groups did not directly address project based impacts on spawning habitats and early life history stages, but it did provide an indirect measure of potential impacts to the guild response (i.e., functional ecological response) to modeled changes in salinity levels as a result of the project. This effort evaluated the relationship between guild abundance and the associated salinity levels in which they occur and proposed that changes in salinity levels will have a minimal impact on the fisheries populations within Mobile Bay.

*The “Freshwater Only” guild was represented by 13 species with the Silverside Shiner, *Notropis candidus*, comprising 94% of the total abundance. This guild occurs primarily in freshwater conditions with salinity < 5 ppt. Members of this guild are rarely collected in Mobile Bay, and within the project area their occurrence is primarily limited to the lower reaches of Mobile Bay tributaries (e.g., Alabama River, Mobile River, Tensaw River and Tombigbee River) where changes in salinity levels are dynamic and may occur seasonally dependent on upriver discharge conditions thereby resulting in localized range contraction/expansion scenarios (i.e., seasonal upstream or downstream expansion). Additional dominant species include Freshwater Drum, *Aplodinotus grunniens*, and Emerald Shiner, *Notropis atherinoides*. All three species are large river inhabitants and common within the Tombigbee and Alabama River systems (Boschung and Maiden 2004). None of these species would become established in low estuarine conditions associated with the freshwater transitional and estuarine zones of Mobile Bay as these habitats do not offer suitable spawning conditions. Therefore, it is likely that members of this guild would not be impacted by modeled projected salinity increases within the project area.*

*“Freshwater Entering Estuary” guild contains 21 species with Sailfin Molly (*Poecilia latipinna*), Threadfin Shad (*Dorosoma petenense*), Blue Catfish (*Ictalurus furcatus*), Largemouth Bass (*Micropterus salmoides*), Redear Sunfish (*Lepomis microlophus*) and Redspotted Sunfish (*Lepomis miniatus*) contributing to 90% of the total abundance for this group. Members of this guild are well documented for their salinity tolerance. Sailfin Molly successfully reproduce in a variety of habitats ranging from freshwater lakes and swamps to salt marshes and estuarine lagoons. Experimental transfers of populations acclimated to fresh or brackish waters indicate both populations are tolerant of ambient salinities ranging from 0-70 ppt for freshwater populations and 0-80 ppt for brackish populations (Nordlie et al. 1992) with mortalities occurring beyond these threshold levels. Although considered*

euryhaline, the species is less tolerant of abrupt salinity changes (Nordlie and Walsh 1989). Observations noted in the FAMP dataset indicates Sailfin Molly within the Mobile Bay project area occur in salinities ranging 0-24 ppt (\bar{X} = 8.2 ppt, ± 1.7 95% CI).

Threadfin shad occur primarily in freshwater but enter coastal waters as well. In coastal Mississippi waterways, the species occurs in salinities of 0.0-35.55 ppt (Ross 2001). Within Mobile Bay the species occurs in 0-35 ppt (\bar{X} = 14.8 ppt, ± 0.8 95% CI). Blue Catfish enter brackish waters in Mississippi with salinities up to 3.7 ppt and occasionally in salinities of 11-15 ppt (in Ross 2001); similar occurrences were noted in Louisiana (Perry 1968). Within Mobile Bay specimens occurred in a range of salinities (0-7.53 ppt; \bar{X} = 0.5 ppt, ± 0.2 95% CI) but were generally found in low salinity conditions. Largemouth bass occur in coastal areas in salinities up to 10 ppt but exhibit poor growth in salinities > 4 ppt; survival is limited during extended exposure to salinities > 12 ppt (in Ross 2001). FAMP data for Mobile Bay depicts similar conditions with occurrence in salinities ranging 0-17 ppt but generally found in low salinity conditions (\bar{X} = 2.3 ppt, ± 0.6 ; 95% CI). Redear Sunfish and Redspotted Sunfish do better in coastal conditions than Largemouth Bass and other sunfishes but exhibit poor growth when salinity exceeds 4 ppt (Ross 2001). As with Largemouth Bass in Mobile Bay, both species are generally found in low salinity conditions (\bar{X} = 2.2 ppt, ± 0.6 ; \bar{X} = 2.6 ppt, ± 1.1 95% CI, respectively).

The biological response of this guild to ambient changes in salinity levels associated with the project are similar to those outlined for the Freshwater Only guild (e.g., localized range contraction/expansion) and due to their relative level of salinity tolerance would likely be minimally impacted. Other than Sailfin Molly it is unknown about the extent of reproduction that occurs within these low salinity reaches for most guild members. However, most members of this guild are considered primarily freshwater inhabitants with expansion into brackish waters not considered critical for the species to maintain local population levels.

The "Resident Estuarine" guild included 21 species with Bay Anchovy (*Anchoa mitchelli*, 94% of total abundance), Inland Silverside (*Menidia beryllina*), Rainwater killifish (*Lucania parva*) and Sheepshead minnow (*Cyprinodon variegatus*) comprising the largest proportion of the total abundance (99.33%). Bay Anchovy is a pelagic species common in brackish waters and is tolerant of a wide range of salinities (*euryhaline*). Spawning occurs in open water from March to October in more saline (30- 37 ppt), deeper waters of bays, tidal passes and around barrier islands. Larvae migrate to shallow low salinity areas of bays and estuaries where the optimal salinity is 3-7 ppt. The optimal range for juveniles is 3-10 ppt (Sable et al. 2016). Within Mobile Bay, Bay Anchovy occurred in salinities ranging 0-38 ppt (\bar{X} = 16.9 ppt, ± 0.3 95% CI) and likely represented both juvenile and adult life history stages.

Inland Silverside occur in a variety of habitats including coastal estuaries and are common at salinities 11-20 ppt (Echelle and Mosier 1982). The spawning period varies regionally and salinity for coastal populations ranges 0-26.5 ppt with most populations spawning at salinities 4.5-18.5 ppt (Middaugh and Hemmer 1992). Occurrences within Mobile Bay were documented in salinities ranging 0-38 ppt with

most occurrences within moderately saline conditions (\bar{X} = 7.3 ppt, ± 0.6 95% CI).

The Rainwater Killifish (*Lucania parva*) inhabits primarily brackish water (0.7-24.2 ppt). Peak spawning is May-June with adults moving into lower salinity waters for spawning and then returning to zones of higher salinity after breeding (in Hendrickson and Cohen 2015). Within Mobile Bay, occurrences have been in 0-27 ppt but more often in lower salinity conditions (\bar{X} = 2.6 ppt, ± 0.5 95% CI). The Sheepshead Minnow (*Cyprinodon variegatus*) is noted for its tolerance of extreme changes in salinity (0-35.6 ppt) but found primarily in salinities < 20 ppt (in Hendrickson and Cohen 2015). Similar to other members of the guild, occurrences within Mobile Bay were documented in salinities ranging 0-32 ppt with most occurrences within moderately saline conditions (\bar{X} = 6.3 ppt, ± 1.3 95% CI).

The “Marine Entering Freshwater” guild was the most speciose guild (98 species) and was associated with salinity ranging 20-33 ppt. Eight species comprised over 92% of the total abundance and included Spot (*Leiostomus xanthurus*), Gulf Menhaden (*Brevoortia patronus*), Atlantic Croaker (*Micropogonias undulatus*), Pinfish (*Lagodon rhomboides*) Spotfin Mojarra (*Eucinostomus argenteus*), Sand Seatrout (*Cynoscion arenarius*), Striped Mullet (*Mugil cephalus*) and Hardhead Catfish (*Ariopsis felis*). Many of the species within this guild are considered estuarine dependent for at least some part of their life cycle (Able 2005). Many species within this guild spawn offshore (e.g., Spot, Gulf Menhaden, Atlantic Croaker) with larvae/juveniles maturing in low salinity estuarine environments and then transitioning along a gradient to higher salinity areas as they mature.

Spot spawn offshore with larvae moving into low salinity tidal creeks to develop into juveniles then transition along a gradient to areas of higher salinity. Adults migrate seasonally between estuarine and coastal waters (ASMFC 2010). Mobile Bay occurrences have been noted in 0-38 ppt and generally in higher salinity areas (\bar{X} = 17.2 ppt, ± 0.4 95% CI). Similarly, Gulf menhaden spawn offshore during December- February with developing larvae drifting into low salinity estuaries to mature. Individuals grow rapidly in the estuaries and move along higher salinity gradient as they mature (VanderKooy and Smith 2015). Mobile Bay occurrences have been noted in 0-38 ppt and generally in higher salinity areas (\bar{X} = 12.8 ppt, ± 0.6 95% CI).

Atlantic Croaker is an estuarine dependent species noted as being extremely euryhaline (0-36 ppt). Young life stages migrate into upstream low salinity habitats and then move downstream as they grow. There is support that Atlantic Croaker can detect and respond to rates of salinity change and will actively avoid unsuitable salinity conditions. Laboratory experiments indicate juvenile Atlantic Croaker grew better at a constant 5 ppt compared to experimental conditions when rates were decreased from 20 to 5 ppt or held at a constant 20 ppt (Peterson et al. 1999). Mobile Bay occurrences have been noted in 0-38 ppt and generally in higher salinity areas (\bar{X} = 17.4 ppt, ± 0.4 95% CI).

Pinfish are considered euryhaline (0-75 ppt) with juveniles inhabiting

vegetated shallow estuaries and mangroves. Adults occur in vegetated deeper channels, jetties and offshore reefs. Adults migrate offshore to spawn in late fall to early winter with a similar inshore drift pattern as noted for Spot and Gulf Menhaden (Forward et al. 1998). Observations within Mobile Bay illustrate the euryhaline characteristic (0-38 ppt) but fish are often associated with higher salinity conditions (\bar{X} = 21.5 ppt, ± 0.6 95% CI). Sand Seatrout spawning takes place in reaches of the lower estuary and nearshore GOM waters. Larvae are transported by wind, tide and current to low salinity areas of the upper estuary. Larval and juvenile Sand Seatrout have been collected in 0-26 ppt with highest catches occurring in < 15 ppt. Larger juveniles are most frequently observed in > 15 ppt and adults occur in salinities up to 45 ppt (Sutter and McIlwain 1987). Mobile Bay occurrences have been noted in 0-38 ppt and generally in higher salinity areas (\bar{X} = 17.5 ppt, ± 0.5 95% CI).

Hardhead Catfish spawn in shallow estuarine waters and males exhibit mouth brooding. The species occurs in salinity from 0-60 ppt and may occasionally enter freshwater (Boschung and Mayden 2004). Within Mobile Bay, the fish has been observed in salinity ranging 0-38 but generally in areas with higher salinity (\bar{X} = 18.5 ppt, ± 0.5 95% CI).

Considering both the Resident Estuarine and Marine Entering Estuary guilds, the majority of these species are considered estuarine dependent species and are generally adapted to varying salinity conditions within the Mobile Bay and Mississippi Sound in response to natural phenomenon such as freshwater influxes and seasonal wind and weather patterns. To examine the influence of increased freshwater on estuarine conditions, Christensen et al. (1997) developed a BioSalinity Index (BSI) to evaluate the effect of a measurable shift in salinity structure on the relative abundance and distribution of a species. Because a significant difference exists between adult and juvenile life stage sensitivity, with juveniles exhibiting lower sensitivity to salinity changes than adults, a separate BSI was developed for each life history stage. The index was developed for 44 NOAA Estuarine Living Marine Resources Program (ELMR) species that are considered commercially and/or recreationally important finfish and macroinvertebrates in GOM estuaries that exhibit ontogenetic shifts in salinity habitat association. Ten species included within their 44 were significant contributors in terms of total abundance to the Mobile Bay FAMP dataset for the Resident Estuarine and Marine Entering Estuary guilds: Bay Anchovy, Gulf Menhaden, Hardhead Catfish, Sheepshead Minnow, Inland Silverside, Pinfish, Atlantic Croaker, Sand Seatrout, Spot and Striped Mullet. For the Mobile Bay estuary (identified in the paper) all were considered to exhibit low sensitivity (i.e., highly tolerant) to shifts in salinity for the juvenile life history stage with Sheepshead Minnow characterized as moderately sensitive (i.e., moderately tolerant). Given that most of these species occur in a wide range of salinities, many are euryhaline, and are tolerant to shifts in salinity, it is likely that members of these two guilds would not be impacted by modeled projected salinity increases within the project area.

*For our analyses, the “Marine Only” guild contained nine species and Red Snapper (*Lutjanus campechanus*) comprised the largest percentage of the total abundance within this guild (91%). This species is one of the most economically*

important reef fish in the northern Gulf of Mexico (GOM). Spawning occurs offshore from April through September with pelagic larvae drifting until they undergo metamorphosis and settle on the bottom where they seek structure (Gallaway et al. 2009). Adults are off shore residents occurring near structure along the continental shelf (Patterson et al. 2007). Age-0 individuals occasionally occur within Mobile Bay, but primarily within the lower bay extent and often near structure (FAMP dataset). Thus, modeled salinity changes within the Mobile Bay project area would have little impact on productivity and recruitment of this fishery. In contrast, Hernandez et al. (2016) proposed that reduced salinity associated with high discharge years in GOM drainages could negatively affect body condition in larval Red Snapper in nearshore habitats.

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Appendix C, Environmental, Attachment C-7

Replace ATTACHMENT C-7, DRAFT PROGRAMMATIC AGREEMENT AMONG THE U.S. ARMY CORPS OF ENGINEERS, THE ALABAMA STATE HISTORIC PRESERVATION OFFICER, AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION REGARDING THE MOBILE HARBOR, MOBILE ALABAMA, GENERAL REEVALUATION STUDY with the attached document labeled: ATTACHMENT C-7, PROGRAMMATIC AGREEMENT AMONG THE U.S. ARMY CORPS OF ENGINEERS, THE ALABAMA STATE HISTORIC PRESERVATION

OFFICER, AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION REGARDING THE MOBILE HARBOR, MOBILE ALABAMA, GENERAL REEVALUATION STUDY.

Appendix D, Real Estate, Section 9 (Page 16)

Delete incomplete sentence at bottom of Section 9.

Appendix D, Real Estate, Section 11 (Pages 17 and 18)

Replace Table 7.1 and 7.2 with the following:

Table 7.1

BASELINE COST ESTIMATE FOR REAL ESTATE (BCERE)	
CATEGORY	COST
A. Lands:	
I. Lands	\$40,000.00
II. Improvements	\$0.00
III. Severance Damages	\$0.00
IV. Minerals	\$0.00
V. Total Lands & Damages	\$40,000.00
B. ADMINISTRATIVE COSTS	
I. Federal Review of Non-Federal Sponsor (includes Nav. Serv. coordination w/ NFS & Substitute Facility)	
1. Sub-Total:	\$20,000.00
2. Contingency (25%)	\$5,000.00
3. Sub-Total:	\$25,000.00
II. Non-Federal Sponsor Administrative Costs (includes Nav. Serv. Coordination, Authorization for Entry, & Substitute Facility)	
1. Administrative Costs	\$35,000.00
2. Contingency (25%)	\$8,750.00
3. Sub-Total:	\$43,750.00
III. Public Law 91-646 Relocation Costs (Substitute Facility)	\$1,800,000.00
IV. Total RE Cost Estimate:	\$1,908,750.00

Table 7.2

Chart of Accounts				
01A	PROJECT PLANNING	FEDERAL	NON-FEDERAL	TOTALS
	Other			
	Project Partnership Agreement (OC)	\$ -	\$ -	\$ -
01AX	Contingencies (25%)	\$ -	\$ -	\$ -
	Subtotal	\$ -	\$ -	\$ -
01B	LANDS AND DAMAGES			
01B20	Acquisition by non-Federal sponsor	\$ -	\$35,000.00	\$35,000.00
01B40	Acq/Review of non-Federal sponsor	\$20,000.00	\$ -	\$20,000.00
01BX	Contingencies (25%)	\$5,000.00	\$8,750.00	\$13,750.00
01R	RE PAYMENTS	FEDERAL	NON-FEDERAL	TOTALS
01R1	LAND PAYMENTS	\$ -	\$ -	\$ -
01R1A	By Government	\$ -	\$ -	\$ -
01R1B	By non-Federal sponsor	\$ -	\$40,000.00	\$40,000.00
	By Government on behalf of non-Federal			
01R1C	sponsor	\$ -	\$ -	\$ -
01R1D	Review of non-Federal sponsor	\$ -	\$ -	\$ -
01RX	Contingencies (25%)	\$ -	\$ -	\$ -
01R2	PL 91-646 Assistance Payments			
01R2A	By Government	\$ -	\$ -	\$ -
			\$	\$
01R2B	By non-Federal sponsor (Sub. Facility)	\$ 0	1,800,000	1,800,000
	By Government on behalf of non-Federal			
01R2C	sponsor	\$ -	\$ -	\$ -
01R2D	Review of non-Federal sponsor	\$ -	\$ -	\$ -
	TOTALS	\$25,000.00	\$1,883,750.00	\$1,908,750.00

Appendix D, Real Estate, Section 17 (Pages 19 and 20)

Replace Section 17 with the following:

*There are no anticipated impacts to roads, highways, railroads, pipelines or other public utilities within or traversing the channel. However, due to the nature of this navigation project and the fact that subject channel traverses an area where pipelines are known to exist, the project Risk Register and the Real Estate Risk Checklist (attached hereto as **Exhibit "D"**) does identify the potential and inherent risk associated with deepening and/or widening the channel.*

Furthermore, due to this inherent risk, it is noted that the NFS shall be required to provide the real property interests, acquire or compel the removal of obstructions, and perform or ensure the performance of relocations required for construction, operation, and maintenance of the Project, if deemed necessary. For each relocation of a utility, or portion thereof, located in or under navigable waters of the United States that is required to accommodate a channel depth over 45 feet, the NFS shall pay to the owner

of the utility at least one half of the owner's relocation costs, unless the owner voluntarily agrees to waive all or a portion of the Non-Federal Sponsor's contribution. The NFS shall pay an additional 10 percent of construction costs less any credit afforded by the Government for the real property interests and relocations, over a period not to exceed 30 years.

In accordance with ER 405-1-12, "ANY CONCLUSION OR CATEGORIZATION CONTAINED IN THIS REAL ESTATE PLAN, OR ELSEWHERE IN THIS PROJECT REPORT, THAT AN ITEM IS A UTILITY OR FACILITY RELOCATION TO BE PERFORMED BY THE NON-FEDERAL SPONSOR AS PART OF ITS LERRD RESPONSIBILITY IS PRELIMINARY ONLY. THE GOVERNMENT WILL MAKE A FINAL DETERMINATION OF THE RELOCATIONS NECESSARY FOR THE CONSTRUCTION, OPERATION, OR MAINTENANCE OF THE PROJECT AFTER FURTHER ANALYSIS AND COMPLETION AND APPROVAL OF FINAL ATTORNEY'S OPINIONS OF COMPENSABILITY FOR EACH OF THE IMPACTED UTILITIES AND FACILITIES."

Typically, for deep draft navigation projects, a facility or utility relocation takes the form of a relocation or removal of a pipeline traversing the project limits which could impede the proposed dredging and/or other project requirements. While, as previously discussed in this section, the current proposed project does not indicate any pipeline relocations of this nature, the study has identified a potential adverse impact to the Town of Dauphin Island's potable water supply as a result of the proposed channel deepening. The potential impact of increasing salinity content of the aquifer on potable water production at the Dauphin Island Water Treatment Facility could decrease the amount of permeate (potable water) production. As such, it is deemed in the best interest to recommend an alteration to the existing water treatment facility and pumping station located on Dauphin Island in accordance with ER 405-1-12-8(a-c), Substitute Facility Doctrine.

The substitute facility doctrine is the underpinning for the concept of relocations as applied to implementation of water resources projects and can be used in this instance as the cost of constructing this substitute facility (i.e. alteration to the existing water treatment facility and pumping station) in lieu of just compensation paid to the facility owner. This facility/utility alteration will in fact serve the Town of Dauphin Island (the utility owner) in the same manner and as reasonably well as the existing facility if in fact an impact would occur to the salinity levels of the potable water due to the deepening of the channel.

Further, the term "relocation" in this situation means providing a functionally equivalent facility to the owner of the existing facility/utility when such action is authorized in accordance with applicable legal principles of just compensation and will take the form of an alteration of the affected facility/utility or part thereof.

The proposed facility/utility alteration is categorized as relocation based on the following necessary findings:

- a. The proposed project could potentially negatively impact the ongoing function or operation of the water treatment facility.*

- b. The Town of Dauphin Island, acting by and through the Dauphin Island Water and Sewer Authority (DIWSA), does in fact have a compensable real property interest in the land on which the impacted portion of the facility is located.*
- c. The facility/utility does serve a public purpose by means of providing infrastructure and conveyance of public drinking water supply.*
- d. The owner does have a responsibility to modify the water treatment facility and appurtenances thereto as a result of both legal and factual necessity.*
- e. A fair market value being applied to this proposal is not obtainable and would result in a manifest injustice to the public, as such, we recommend this substitute facility*

The cost for the facility alteration is conservatively estimated at \$1.8M and would be executed by the NFS under the guidance set forth under the aforementioned guidance. Under this guidance, the costs incurred by the NFS would be applied towards their cost share of the project. These costs will be reflected in the Project Partnership Agreement which will be signed prior to construction of the channel modifications and any upgrades to the Dauphin Island Water Treatment Facility.

Supplemental Information

For

Appendix A, Engineering, Attachment A-1

Analysis of the Wilmott's IA's and Comparisons
Between Predicted Mean and Variance with Observed

Analysis of the Wilmott's IA's and Comparisons Between Predicted Mean and Variance with Observed

Wilmott (1981) gave guidance for evaluating model performance. His specific criticism was on the inadequacy of using the correlation coefficient for model evaluation. He devised the skills score using Index of Agreement (IA)

$$d = 1 - \frac{\sum_{i=1}^N (P_i - O_i)^2}{\sum_{i=1}^N [|P_i - \bar{O}| + |O_i - \bar{O}|]^2} \quad (1)$$

Here, d is IA. P represents prediction and O represents observation. Overbar denotes mean and i denotes individual samples. In essence, d depends on both the specific potential error (denominator) based on distribution of observed and predicted variate around the observed mean and the mean square error (numerator) representing the closeness of prediction to observation. He demonstrated that this descriptive statistic, IA, reflects the degree to which the observed variate is accurately estimated by the simulated variate. This IA, ranging from 0 to 1 with 1 representing perfect comparison, is used in this study to test the model performance.

For water levels at the 9 National Oceanic and Atmospheric Administration (NOAA) tide gage locations in the model domain displayed in Figures 12-16, of Appendix A-1 to which this document is attached, Wilmott's IAs were computed from hourly records from observation and hourly data from model simulations. The Wilmott's IAs are displayed in Table 1 below.

Table 1. Index of Agreement (IA) for simulated water levels

NOAA Tide Gage Station	IA
Pensacola, FL	0.93
Weeks Bay, Mobile Bay, AL	0.95
Mobile State Docks, AL	0.95
Coast Guard Sector Mobile, AL	0.96
Dauphin Island, AL	0.93
Dock E, Port of Pascagoula, MS	0.94
Pascagoula NOAA Lab, MS	0.95
Bay Waveland Yacht Club, MS	0.95
Shell Beach, LA	0.91

The IA values for water levels at NOAA tide gage stations were all above 0.9. Note that the locations are extended to whole modeling domain well beyond Mobile Bay. Figures 1-3 show comparisons of predicted vs observed water levels at NOAA gage locations in Mobile Bay.

Analysis of the Wilmott's IA's and Comparisons Between Predicted Mean and Variance with Observed

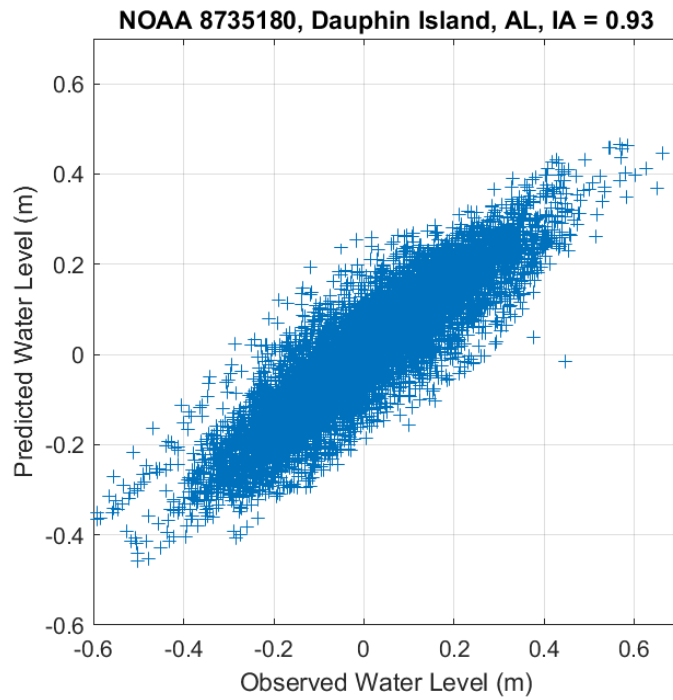


Figure 1. Comparison of predicted vs observed water levels at NOAA gage location at Dauphin Island

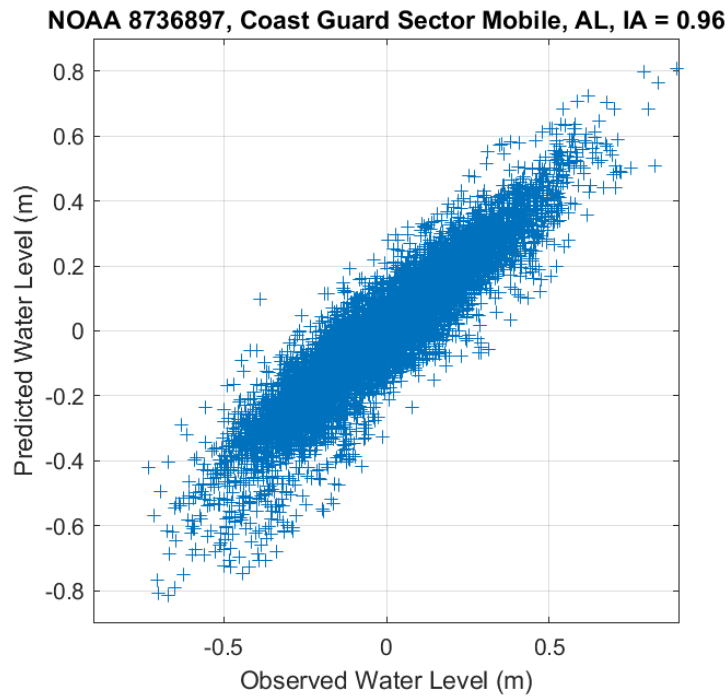


Figure 2. Comparison of predicted vs observed water levels at NOAA gage location at Mobile Coast Guard Station

Analysis of the Wilmott's IA's and Comparisons Between Predicted Mean and Variance with Observed

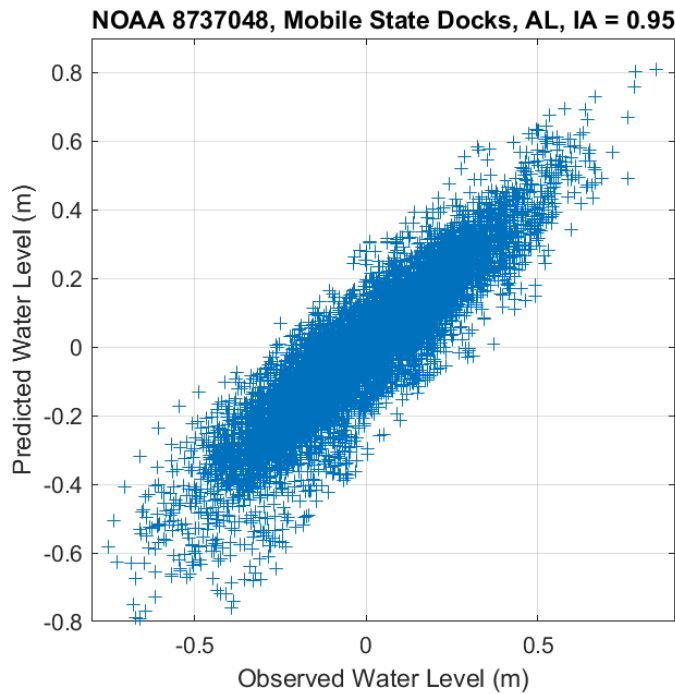


Figure 3. Comparison of predicted vs observed water levels at NOAA gage location at Mobile State Dock

There were a total 27 surveys of salinity profiles that are represented in Figures 20-28 of Appendix A-1 to which this document is attached. In each survey, sampling times varied along the survey line as well as along each vertical locations. Thus 6 hours of model data around each sampling time at each locations were used for model evaluation. At each survey depth at each survey location, an envelope formed by model data was compared to survey data and selected for computation of Wilmott's IA. The Wilmott's IAs are displayed in Table 2 below. Again, the IA values are above 0.93 for all the transect locations throughout year 2010. Figure 4 is an example of salinity comparison near Middle Bay light (MB).

Table 2. Index of Agreement for simulated salinity at profile survey locations

Profile Survey Station	IA
DI	0.94
M1	0.93
M2	0.95
M3	0.96
M4	0.96
MB	0.96
Middle Bay Light NEP Station	0.96

Analysis of the Wilmott's IA's and Comparisons Between Predicted Mean and Variance with Observed

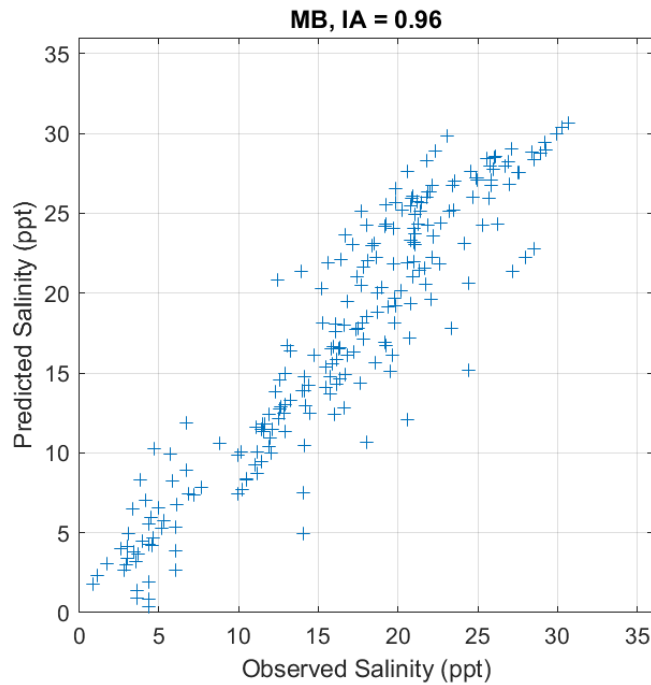


Figure 4. Comparison of predicted vs observed salinity at Middle Bay Light Transect location over 2010

The parameters available for water quality data are based on discrete data with scattered values over several observations at each station as shown in Figures 73-80 of Appendix A-1 to which this document is attached. As such, statistical parameters such as IA and/or root mean square error do not necessarily provide meaningful information. Table 3 shows number of observations for selected water quality parameters modeled. Except dissolved oxygen that has 147 observation points, the number of observations for water quality parameters are under 70. With this limits in number of observations, IA for key water quality parameters including DIP, Nitrate, DO, and Water Temperature are above 0.5, which indicate acceptable prediction over observation. Most of reasonable statistics for a water quality model whose kinetics represents large temporal and spatial scale processes, compared to the hydrodynamic model would be as suggested an evaluation of the model bias. Modeled parameters were compared with observed parameters where observed data were available. Because limited number of observations were available at each station whereas predictions were given continually, reasonable statistical analyses would be to compare first and second order moments, i.e., mean and variance. Tables 4 and 5 provide comparisons for mean and variance values.

Table 3. Number of Observations and IA

Analysis of the Wilmott's IA's and Comparisons Between Predicted Mean and Variance with Observed

	DIP	DO	NH3N	Nitrate	Salt	TSS	Temp
# of observation	39	147	39	39	70	25	51
IA	0.56	0.68	0.14	0.76	0.93	0.29	0.99

Table 4. Comparison of Mean values

	DIP	DO	NH3N	Nitrate	Salt	TSS	Temp
Observed	9.72E-03	6.61	0.04	0.17	11.38	21.68	15.75
Predicted	9.68E-03	8.57	0.06	0.14	8.71	16.32	16.84

Table 5. Comparison of Variances

	DIP	DO	NH3N	Nitrate	Salt	TSS	Temp
Observed	4.60E-05	13.13	0.00	0.03	131.95	697.39	140.28
Predicted	7.69E-05	5.25	0.01	0.02	96.00	23.30	109.44

Based on these comparisons, predicted water quality parameters were comparable to observed ones. Unlike other water quality parameters as uncertainties of kinetic coefficients were evident, predicted water temperature and salinity exhibit statistically good agreement with observed ones. For example, IA values for water temperature (Fig 5) and salinity at the selected stations were 0.99 and 0.93, respectively. The dissolved oxygen (DO) has positive bias, about 1.96 mg/L, and the IA is about 0.7 (Fig 6). Considering uncertainty in spatial distribution of sediment oxygen demand as such, the statistics indicate the water quality model is calibrated for project impact assessment. The information provided above will be reflected in an ERRATA Sheet to the final GRR/SEIS.

Analysis of the Wilmott's IA's and Comparisons Between Predicted Mean and Variance with Observed

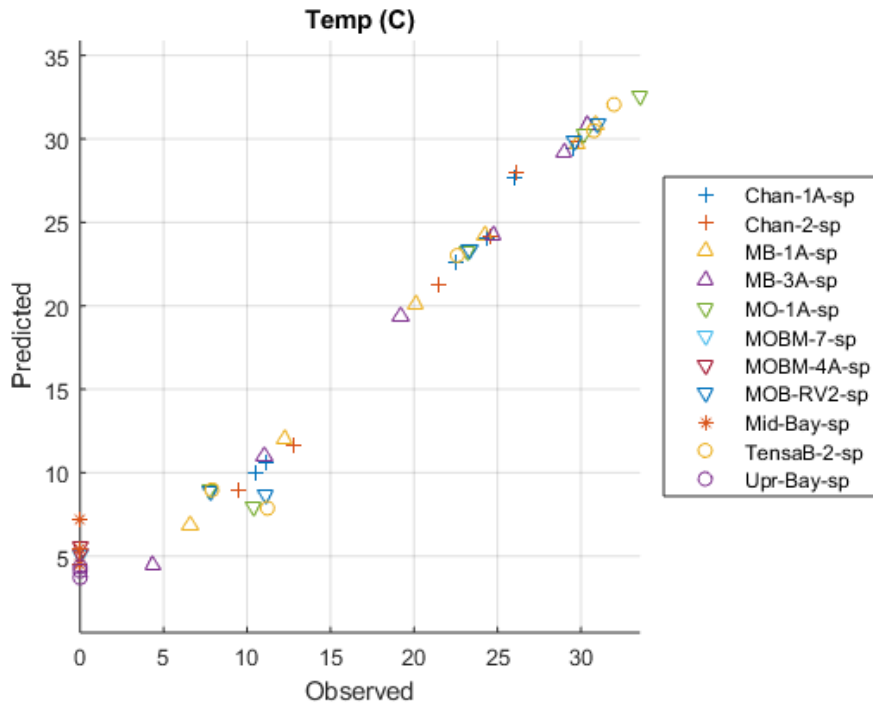


Figure 5. Comparison of predicted vs observed water temperatures at selected stations.

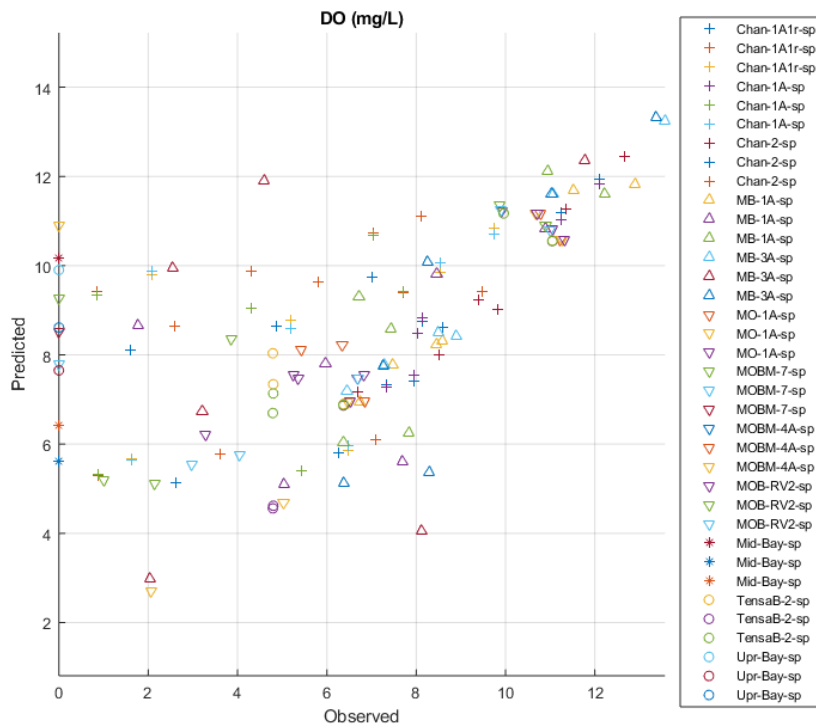


Figure 6. Comparison of predicted vs observed dissolved oxygen at selected stations

- Wilmott, C.J., 1981. On the Validation of Models. *Physical Geography* 2: 184- 194.

ENVIRONMENTAL APPENDIX C

ATTACHMENT C-7

**PROGRAMMATIC AGREEMENT
AMONG
THE U.S. ARMY CORPS OF ENGINEERS,
THE ALABAMA STATE HISTORIC PRESERVATION
OFFICER, AND THE ADVISORY COUNCIL ON
HISTORIC PRESERVATION REGARDING THE MOBILE
HARBOR, MOBILE ALABAMA, GENERAL
REEVALUATION STUDY**

**PROGRAMMATIC AGREEMENT
BETWEEN
THE U.S. ARMY CORPS OF ENGINEERS AND
THE ALABAMA STATE HISTORIC PRESERVATION OFFICER REGARDING
THE MOBILE HARBOR, MOBILE ALABAMA, GENERAL REEVALUATION
STUDY**

WHEREAS, the U.S. Army Corps of Engineers, Mobile District (Corps), is making navigation improvements to federally authorized Mobile Harbor navigation project (Project) as authorized in the in Section 201(a) of the Water Resources Development Act (WRDA) of 1986, as amended by Section 302 of the WRDA of 1996; and

WHEREAS, the Project is being developed to improve Mobile Harbor and reduce navigation risks within the Mobile River, Upper Bay, Lower Bay, and Entrance Channels in Mobile Harbor; and

WHEREAS, the Corps proposes to deepen the existing channel an additional 5 feet (existing 45-foot deep channel in the bay to 50 feet and existing 47-foot deep channel in the bar to 52 feet); adding an additional 100 feet of widening for a distance of 3 miles beginning at the upper end of the bend area at the 50-foot depth; including bend easing with the deepening at the upper end of the bar channel; and modification to the Choctaw Pass turning basin to ensure safe operations at the 50-foot depth, and disposal of new work dredged material in the Relict shell mined area, the Mobile Ocean Dredged Material Disposal Site (ODMDS), and in the Sand Island Beneficial Use Area (SIBUA) Expansion should any bar channel material be identified in sufficient quantity to warrant placement; and

WHEREAS, the Project comprises both the development and implementation of the Project, and the Corps will be the Lead Federal Agency for compliance with 54 U.S.C. § 306108 (National Historic Preservation Act (NHPA) Section 106); and

WHEREAS, the Corps has determined that improvements to Mobile Harbor constitutes an Undertaking, as defined in 36 C.F.R. § 800.16(y), and therefore is subject to Section 106 of the NHPA; and

WHEREAS, the Corps has determined that the Mobile Harbor General Reevaluation Report (GRR) with an Integrated Supplemental Environmental Impact Statement (SEIS) has the potential to affect properties that could be eligible for listing in the National Register of Historic Places (NRHP) and have consulted with the Alabama State Historic Preservation Officer (SHPO) pursuant to the NHPA; and

WHEREAS, the Corps has determined that the Project's Area of Potential Effects (APE) includes areas within Mobile Bay and Harbor including a 5.3 hectare area of the Choctaw Basin, the Bay Channel, the Bar Channel, the Relict shell mined areas within Mobile Bay, the ODMDs, and the SIBUA Expansion as described and depicted on maps in Appendix A to this agreement; and

WHEREAS, the Corps has identified at least 2 potential Historic Properties in the channel widening portion of the APE, that may be affected by the undertaking; and

WHEREAS, the Corps has identified a landform sensitive for pre-Contact Native American inundated sites in the channel bend easing portion of the APE; and

WHEREAS, the Corps as lead federal agency, with the concurrence of SHPO, has decided to comply with Section 106 of the NHPA for the Undertaking through the execution and implementation of a Programmatic Agreement (Agreement), following 36 C.F.R. § 800.14(b); and

WHEREAS, the Alabama State Port Authority (ASPA) is the non-Federal sponsor for the Project and has been invited to be a Concurring Party to this Agreement; and

WHEREAS, in accordance with 36 C.F.R. § 800.2(c)(2)(ii)(A), 800.3(f)(2), and 800.14(b)(2)(i), the Corps has contacted Federally Recognized Native American Tribes, via letter(s), phone call(s), email(s) and meetings, to invite them to consult on the Mobile Harbor GRR with an Integrated SEIS and this Agreement, including the Absentee-Shawnee Tribe of Oklahoma, the Alabama-Coushatta Tribes of Texas, the Alabama-Quassarte Tribal Town, the Caddo Nation of Oklahoma, the Catawba Indian Nation, the Cherokee Nation, the Chickasaw Nation, the Chitimacha Tribe of Louisiana, the Choctaw Nation of Oklahoma, The Coushatta Tribe of Louisiana, Eastern Band of the Cherokee Nation, the Eastern Shawnee Tribe of Oklahoma, the Jena Band of Choctaw Indians of Louisiana, the Kialegee Tribal Town of Oklahoma, the Miccosukee Tribe of Indians of Florida, the Mississippi Band of Choctaw Indians, Muscogee (Creek) Nation, the Poarch Band of Creek Indians, the Quapaw Tribe of Indians of Oklahoma, Shawnee Tribe of Oklahoma, the Seminole Nation of Oklahoma, the Seminole Tribe of Florida, the Thlopthlocco Tribal Town, Tunica-Biloxi Indian Tribe of Louisiana, and the United Keetoowah Band of Cherokee Indians in Oklahoma; and

WHEREAS, in accordance with 36 C.F.R. § 800.2(c)(5), the Corps has contacted additional interested parties via letter(s), phone call(s), email(s), and meetings, to invite them to consult on the Mobile Harbor GRR with an Integrated SEIS and this Agreement, including other non-Federally listed Tribes and Native American individuals and other interested parties; and

WHEREAS, in accordance with 36 C.F.R. § 800.14(b)(3), the Corps invited the Advisory Council on Historic Preservation (ACHP) per 36 C.F.R. § 800.6(a)(1)(C) to participate in consultations to resolve potential adverse effects of the Mobile Harbor Improvement Project, including development of this Agreement and in a letter dated May 7, 2019 the ACHP has chosen not to participate; and

WHEREAS, in accordance with 36 C.F.R. § 800.6(a)(4) and 36 C.F.R. § 800.14(b)(2)(ii), the Corps held a series of public meetings to notify the public of the Mobile Harbor GRR with an Integrated SEIS and provide an opportunity for members of the public to comment on the Project and the Section 106 process. These were conducted on March 16, 2017, September 16, 2017, and February 22, 2018 in Downtown Mobile, South Mobile County, and Daphne, Alabama; and

NOW, THEREFORE, the signatories agree that the Undertaking shall be implemented in accordance with the following stipulations in order to take into account the effects of the undertaking on Historic Properties.

STIPULATIONS

The Corps shall ensure that the following measures are carried out:

I. TIME FRAMES AND REVIEW PROCEDURES

A. Document and Deliverable Review. For all documents and deliverables produced in compliance with this Agreement, the Corps will have thirty (30) calendar days to review. After completing its review, the Corps shall provide a hard copy draft document via mail or digital copies via email to the SHPO, Concurring Parties, and Federally Recognized Tribes, and other interested parties for review. Any written comments provided by the SHPO, Federally Recognized Tribes, and other interested parties within thirty (30) calendar days from the date of receipt shall be considered in the revision of the document or deliverable. The Corps shall document and report the written comments received for the document or deliverable and how comments were addressed. The Corps shall provide a revised final document or deliverable to the SHPO for concurrence. The SHPO shall have thirty (30) calendar days to respond. Failure of the SHPO, Concurring Parties, and Native American interested parties and Tribes to respond within thirty (30) calendar days of any submittal shall not preclude the Corps from moving to the next step in this Agreement. A copy of the

final document shall be provided to the Signatories and to any consulting parties who request it, as appropriate per **Stipulation X (Confidentiality)**.

B. Disagreement. Should the SHPO, Federally Recognized Tribes, or an interested party object to the findings of NRHP eligibility and/or findings of effect within the final document or deliverable submitted for concurrence, the Corps, SHPO, Federally Recognized Tribes, and interested parties shall consult for a period not to exceed fifteen (15) calendar days following the receipt of SHPO's, a Federally Recognized Tribe's, or an interested party's written objection in an effort to come to agreement on the issues to which the SHPO, Federally Recognized tribe, or interested party has objected. Should the SHPO, a Federally Recognized Tribe, or interested party be unable to agree on the issues to which the SHPO, a Federally Recognized Tribe, or an interested party has objected, the SHPO, and the Corps shall proceed in accordance with **Stipulation XI (Dispute Resolution)**, below. The timeframe to consult to resolve a disagreement or objection may be extended by mutual consent of the Signatories.

II. AREA OF POTENTIAL EFFECTS

- A. DETERMINATION OF THE AREA OF POTENTIAL EFFECTS.** The APE for Project activities has been determined by the Corps as Lead Federal Agency. It includes portions of Mobile Harbor, portions of the Mobile Harbor Channel, and offshore dredge disposal sites that may be affected by proposed navigation improvement measures. Maps of the APE are provided in Appendix A.
- B. APE REVISIONS.** If the APE boundaries are revised during the course of the Project, the Corps will delineate the revised areas and consult on that revision in accordance with **Stipulation I (Timeframes and Review Procedures)**, and the Corps shall determine the potential for Project activities in a revised APE to affect potential Historic Properties which could include an additional Phase I underwater remote sensing survey according to **Stipulation III A (Identification of Historic Properties)**.
- C. ODMDS.** The ODMDS was previously subjected to an underwater remote sensing survey in 1983 and a portion of this large disposal area has been in continuous use since 1970 (Plate 4, Appendix A). If necessary, the Corps may propose to use the previously unutilized portions of the ODMDS subjected to the 1983 survey. If the Corps proposes to use any portion of the unused ODMDS, the Corps will delineate the proposed area and conduct a Phase I underwater remote sensing survey for the presence of Historic Properties according to **Stipulation III.A. (Identification of Historic Properties)**. If any magnetic anomalies, acoustic contacts, and reflectors are detected during the survey which

could represent Historic Properties they will be evaluated according to **Stipulation III B (Evaluation and Determination of Effect)**.

III. IDENTIFICATION, EVALUATION, AND DETERMINATION OF EFFECT

The Corps shall complete any identification and evaluation of Historic Properties prior to proceeding with construction. Much of the APE has already been inventoried utilizing current remote sensing methods and equipment. Specifically, remote sensing surveys of the Choctaw Basin, the Bay Channel, the Bar Channel, the relict shell mined areas within Mobile Bay, and the SIBUA Extension portions of the APE have recently been completed. These identified various potential Historic Properties which will be subjected to a Phase II investigation and evaluation.

A. Identification of Historic Properties. Pursuant to 36 C.F.R. § 800.4 and in consultation with the Signatories and consulting parties of this agreement, the Corps shall conduct Phase I remote sensing surveys to identify Historic Properties when the APE boundaries are revised to included areas that have not been surveyed or have not been subjected to prior dredging or use as a disposal site pursuant to 36 C.F.R. § 336.0(6). Prior to surveying these areas, the Corps shall coordinate with the SHPO, Federally Recognized Tribes, and other interested parties according to **Stipulation II (Area of Potential Effect)** of this Agreement. The scope of the Phase I inventory and contents of the survey report are listed below:

1. Submit a scope of work (SOW) for Phase I fieldwork for review and approval by the SHPO and for review and comment by Federally Recognized Tribes and other interested parties.
2. Conduct archival research to determine the known history and pre-Contact history of the area prior to fieldwork.
3. Conduct an underwater remote sensing survey to locate potentially NRHP eligible objects, vessels, or sites of the entire APE utilizing a magnetometer, sidescan sonar, sub-bottom profiler, GPS, and depth finder.
4. Prepare a survey report that includes the nature of the project, methods, pre-Contact and historic contexts, and inventory of anomalies, an evaluation of all anomalies for significance and integrity, conclusions, and recommendations. A draft and draft final survey report will be submitted to the SHPO, Federally Recognized Tribes, and other interested parties for review and comment following **Stipulation I (Timeframes and Review Procedures)** of this Agreement.

B. Evaluation and Determination of Effect. Anomalies and acoustic contacts determined to be cultural resources will be assessed by a qualified professional for their eligibility for listing in the NRHP consistent with the *Secretary of Interior's Standards for Evaluation*, 36 C.F.R. § 60.4. If during the Phase I remote sensing survey of the APE, magnetic anomalies, acoustic contacts, and reflectors are detected which could represent Historic Properties, these magnetic anomalies, acoustic contacts, and reflectors could be subjected to a Phase II evaluation to determine if they are NRHP eligible resources. The scope of Phase II evaluations along with a description of the contents of the evaluation report are listed below:

1. Submit a SOW for Phase II fieldwork for review and approval by the SHPO and for review and comment by Federally Recognized Tribes and other interested parties.
2. Phase II Objectives: The objective of the Phase II evaluation is to collect data regarding site significance and integrity from which determinations of NRHP eligibility can be made. Field methods for the Phase II investigation could include additional remote-sensing work to capture more detailed data on magnetic anomalies, acoustic contacts, and reflectors and the use of archaeological divers to assess previously identified anomalies and contacts for NRHP eligibility.
3. Rational: Completed Phase I Remote-Sensing surveys of the Mobile Harbor APE identified two (2) potential Historic Properties and a natural landform sensitive for inundated pre-Contact Native American sites in the Channel widening and bend easing portions of the APE. However, as these are all submerged, the integrity and NRHP eligibility of these resources are currently unknown. Further investigation is therefore required to determine if implementation of the Project will impact any Historic Properties.
4. A draft Phase II Survey, Evaluation, and Determination of Effects report will be prepared within 60 days following the completion of the fieldwork. The draft report will include a description of project purposes, specific methods guiding the Phase II resource survey work including the results of fieldwork with site descriptions and locational data. The report will also contain evaluations of site significance using NRHP eligibility criteria and determinations of effects. Specific sites requiring mitigation measures will also be identified in this report. The Corps shall prepare and submit the draft and final Phase II Survey, Evaluation, and Determination of Effects Reports in accordance with **Stipulation I (Timeframes and Review Procedures)**. Confidentiality regarding the nature and location of archaeological sites and any other cultural resource discussed in any Phase II report under this agreement shall be maintained. Also, if any information provided to the Corps by Native American tribes or others who wish to control the dissemination of that information, the Corps will make a

good faith effort to do so, to the extent permissible by law according to **Stipulation X (Confidentiality)** of this Agreement.

If SHPO, any Federally Recognized Tribes, or other interested parties disagree with the Corps' determinations of NRHP eligibility and effects, the Corps shall notify the SHPO, Federally Recognized Tribes, and other parties of the dispute and consult with the SHPO. If the dispute cannot be resolved, the Corps shall seek a formal determination of eligibility from the Keeper of the National Register. The Keeper's determination will be final in accordance with 36 C.F.R. 63.4.

Avoidance of adverse effects to Historic Properties is always the preferred treatment approach. However, it may not be possible to redesign the Project in order to avoid resources within the APE. The Corps will apply the criteria of adverse effect, pursuant to 36 C.F.R. § 800.5(a)(1), to all Historic Properties within the APE. If the Corps determines that Historic Properties will be adversely affected, **Stipulation IV (Historic Properties Treatment Plan)**, below, will be followed.

IV. HISTORIC PROPERTIES TREATMENT PLAN

If it is determined that project activities will result in adverse effects, the Corps, in consultation with the SHPO, Federally Recognized Tribes, and other interested parties shall develop a Historic Properties Treatment Plan (HPTP) to resolve all adverse effects resulting from the Project, which would be appended to this PA. The HPTP shall outline the minimization and mitigation measures necessary to resolve the adverse effects to Historic Properties. Proposed mitigation measures may include, but are not limited to, oral history, interpretive brochures, data recovery, or publications depending on their criterion for eligibility. Development of appropriate measures shall include consideration of Historic Property types and provisions for avoidance or protection of Historic Properties where possible.

If adverse effects are identified, the HPTP shall be in effect before construction commences. The HPTP may be amended and appended to this PA without amending the PA.

A. Review: The Corps shall submit the Draft HPTP to the SHPO, Federally Recognized Tribes, and other interested parties for review and comment pursuant to **Stipulation I (Timeframes and Review Procedures)**.

B. Reporting: Reports and other data pertaining to archaeological site locations and the treatment of effects to Historic Properties will be distributed to Federally Recognized Tribes and other interested parties, tribes, and other members of the public, consistent with **Stipulation X (Confidentiality)** of this PA, unless parties have indicated through consultation that they do not want to receive a report or data.

C. Amendments/Addendums/Revisions: If a Historic Property that is not covered by the existing HPTP is discovered within the APE subsequent to the initial inventory effort, or if there are previously unexpected effects to a Historic Property, or if the Corps and SHPO agree that a modification to the HPTP is necessary, the Corps shall prepare an addendum to the HPTP. The Corps shall then submit the addendum to the SHPO, Federally Recognized Tribes, and other interested parties for review and comment, and if necessary, shall follow the provisions of **Stipulation IX (New Discoveries)**. The HPTP may cover multiple discoveries for the same property type.

D. Data Recovery: When data recovery is proposed, the Corps, in consultation with the SHPO, Federally Recognized Tribes, and other interested parties shall ensure that specific Research Designs are developed consistent with the *Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation* and the ACHP's "Recommended Approach for Consultation on Recovery of Significant Information from Archaeological Sites" (ACHP, May 18, 1999).

V. QUALIFICATIONS

A. Professional Qualifications: All technical work required for historic preservation activities implemented pursuant to this Agreement shall be carried out by or under the direct supervision of a person or persons meeting, at a minimum, the *Secretary of Interior's Professional Qualifications Standards* for archeology or history, as appropriate (48 FR 44739). "Technical work" here means all efforts to inventory, evaluate, and perform subsequent treatment such as data recovery excavation or recordation of potential Historic Properties that is required under this Agreement. This stipulation shall not be construed to limit peer review, guidance, or editing of documents by SHPO and associated Project consultants.

B. Historic Preservation Standards: Historic preservation activities carried out pursuant to this Agreement shall meet the *Secretary of Interior's Standards and Guidelines for Archaeology and Historic Preservation* (48 FR 44716-44740), as well as standards and guidelines for historic preservation activities established by the SHPO. The Corps shall ensure that all reports prepared pursuant to this Agreement will be provided to the Signatories, Federally Recognized Tribes, and other interested parties, and are distributed in accordance with **Stipulation X (Confidentiality)**, and meet published standards of the Alabama Historical Commission, Administrative Code, Chapter 460-X-9.02(4) as updated in 2006 (Standards for Reports) and *Preservation Planning Bulletin* Number 4(a), "Archaeological Resources Management Reports (ARMR): Recommended Contents and Format" (December 1989).

VI. CONSULTATION WITH TRIBES AND INTERESTED PARTIES

A. In consultation with Federally Recognized Tribes and other interested Native American parties or individuals, the Corps will make a reasonable and good-faith effort to identify Historic Properties of traditional religious and cultural importance. As the Lead Federal Agency, the Corps shall ensure that consultation regarding site condition assessment, monitoring efforts, and determinations of eligibility and effects with other interested Native American parties and individuals continues throughout the implementation of the Agreement. The Corps shall be responsible for transmitting all relevant documents and deliverables to Federally Recognized Tribes and other interested Native American parties or individuals as part of their tribal consultation responsibility.

B. Federally Recognized Tribes and other interested Native American parties and individuals may choose not to sign this Agreement as a Concurring Party. However, the Corps will make a good faith effort to contact Federally Recognized Tribes and other interested Native American parties and individuals, not acting as Concurring Parties to the Agreement, with potential interest in consulting on site condition assessment efforts and on the proposed treatment of Historic Properties or potential Historic Properties. Efforts to identify these individuals or groups may include using online databases, consultations for previous projects, and using personal and professional knowledge. The Corps will then contact each identified organization and individual by phone, mail, or email inviting them to consult on additional Phase I efforts, Phase II investigations, site assessment efforts, and proposed treatments of Historic Properties or potential Historic Properties. Consultations may be carried out through either letters of notification, public meetings, environmental assessments/environmental impact statements, and/or other methods requested by a Federally Recognized Tribe or other interested Native American parties or individuals. Failure of any contacted group or individual to comment within thirty (30) calendar days shall not preclude the Corps from proceeding with the Project.

C. The Corps shall make a reasonable and good-faith effort to ensure that Native American Tribes or other interested parties, acting as either Concurring Parties or those expressing interest in the project, will be invited to participate in the implementation of the terms of this Agreement. Review periods shall be consistent with **Stipulation I (Timeframes and Review Procedures)**. The Corps shall ensure that all reviewers from Federally Recognized Tribes and other interested parties shall receive copies of all reports.

VII. TREATMENT OF HUMAN REMAINS

A. In the event that Native American human remains, as well as Native American funerary objects, sacred objects, or objects of cultural patrimony are encountered within the APE during the Project, those remains and objects are subject to the Native American Graves Protection and Repatriation Act

(NAGPRA) (25 U.S.C. 3001 *et seq.*) and treatment under NAGPRA's implementing regulations at 43 C.F.R. Part 10. When NAGPRA items are discovered inadvertently, an appropriate Corps official must be notified immediately upon the discovery. The Corps shall follow the requirements of 43 C.F.R. §10.3 for consultation; notification; development of excavation, treatment, and disposition plans as needed; and the requirements of 43 C.F.R. §10.6 for NAGPRA item disposition. The Corps will also notify the SHPO, Federally Recognized Tribes, other interested Native American parties, and individuals within 24 hours in the event that Native American human remains, Native American funerary objects, sacred objects, or objects of cultural patrimony are encountered. Confidentiality regarding the nature and locations of Native American remains, funerary objects, sacred objects, or objects of cultural patrimony under this agreement shall be maintained. Also, if any information provided to the Corps by Native American tribes or others who wish to control the dissemination of that information, the Corps will make a good faith effort to do so, to the extent permissible by law according to **Stipulation X (Confidentiality)** of this Agreement.

B. In the event non-native human remains or unmarked human burials are encountered within the APE, those remains will be subject to the Alabama Historical Commission, Administrative Code, Chapter 460-X-10 (Burials) and Alabama's Burial Act, § 13A-7-23.1, as amended. When unmarked human burials or non-native human skeletal remains are inadvertently found, the appropriate Corps official must be notified immediately upon the discovery. The Corps will follow the requirements regarding notification, treatment, and jurisdiction under Chapter 460-X-10(f) (Notification).

VIII. PUBLIC CONSULTATION AND PUBLIC NOTICE

A. The interested public will be invited to provide input during the implementation of this document. The Corps shall carry this out through letters of notification, public meetings, and environmental assessment/environmental impact statements. The Corps shall ensure that any comments received from members of the public are taken under consideration and incorporated where appropriate. Review periods shall be consistent with **Stipulation I (Timeframes and Review Procedures)**. In seeking input from the interested public, locations of Historic Properties will be handled in accordance with **Stipulation X (Confidentiality)**. In cases where the release of location information may cause harm to the Historic Property, this information will be withheld from the public in accordance with Section 304 of the NHPA (54 U.S.C. § 307103).

IX. NEW DISCOVERIES

A. If new and unanticipated Historic Properties are inadvertently discovered during implementation of the Undertaking, the Mobile District will cease all work in the vicinity of the discovery until it can be evaluated. If the property is

determined to be NRHP eligible, the Corps shall consult with the SHPO, Federally Recognized Tribes, and other interested parties to develop a treatment plan according to **Stipulation IV (Historic Properties Treatment Plan)**.

B. The Corps will implement the HPTP once it has been reviewed by Federally Recognized Tribes and other interested parties according to **Stipulation I (Timeframes and Review Procedures)** and the HPTP has been approved by SHPO.

X. CONFIDENTIALITY

Confidentiality regarding the specific nature and location of the archaeological sites and any other cultural resource discussed in this Agreement shall be maintained to the extent allowable by law. Dissemination of such information shall be limited to appropriate Corps personnel, contractors, Federally Recognized Tribes, the SHPO, and other parties involved in planning, reviewing and implementing this Agreement and in accordance with Section 304 of the NHPA (54 U.S.C. § 307103). When information is provided to the Corps by Native American tribes or others who wish to control the dissemination of that information more than described above, the Corps will make a good faith effort to do so, to the extent permissible by law.

XI. DISPUTE RESOLUTION

A. Should any signatory or concurring party to this Agreement object at any time to any actions proposed or the manner in which the terms of this agreement are implemented, the Corps shall consult with such party to resolve the objection. If the Corps determines that such objection cannot be resolved, the Corps will:

1. Forward all documentation relevant to the dispute, including the District's proposed resolution, to the ACHP. The ACHP shall provide the Corps with its advice on the resolution of the objection within thirty (30) days of receiving adequate documentation. Prior to reaching a final decision on the dispute, the Corps shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the ACHP, signatories and concurring parties, and provide them with a copy of this written response. The District will then proceed according to its final decision.
2. If the ACHP does not provide its advice regarding the dispute within the thirty (30) day time period, the Corps may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, the Corps shall prepare a written response that takes into account any timely comments regarding the dispute from the signatories and concurring parties to the Agreement, and provide them and the ACHP with a copy of such written response.

3. The Corps' responsibility to carry out all other actions subject to the terms of this Agreement that are not the subject of the dispute remain unchanged.

B. At any time during implementation of the measures stipulated in this Agreement should an objection pertaining to the Agreement be raised by a Native American Tribe, or a member of the public, the Corps shall notify the Signatory and Concurring Parties and take the objection under consideration, consulting with the objecting party and, should the objecting party request, any of the Signatory and Concurring Parties to this Agreement, for no longer than fifteen (15) calendar days. The Corps shall consider the objection, and in reaching its decision, will consider all comments provided by the other signatories and concurring parties. Within fifteen (15) calendar days following closure of the comment period, the Corps will render a decision regarding the objection and respond to the objecting party. The Corps will promptly notify the other signatories and concurring parties of its decision in writing, including a copy of the response to the objecting party. The Corps' decision regarding resolution of the objection will be final. Following issuance of its final decision, the Corps may authorize the action that was the subject of the dispute to proceed in accordance with the terms of that decision. The Corps' responsibility to carry out all other actions under this Agreement shall remain unchanged.

C. Should any Signatory Party to this Agreement object in writing to the determination of National Register eligibility, the objection will be addressed pursuant to 36 C.F.R. § 800.4(c)(2).

XII. NOTICES

A. All notices, demands, requests, consents, approvals or communications from all parties to this Agreement to other parties to this Agreement shall be either personally delivered, sent by United States Mail, or emailed, and all parties shall be considered in receipt of the materials five (5) calendar days after deposit in the United States mail or the on the day after being emailed.

B. If Signatory and Concurring Parties agree in advance in writing or by email, facsimiles, emails, or copies of signed documents may be used as if they bore original signatures.

C. If Signatory Parties agree, hard copies and/or electronic communications may be used for formal communication amongst themselves for activities in support of **Stipulation I (Time Frames and Review Procedures)**.

XIII. AMENDMENTS, NONCOMPLIANCE, AND TERMINATION

A. Amendments: Any Signatory to this Agreement may propose that the Agreement be amended, whereupon the Corps shall consult with the SHPO to consider such amendment. This Agreement may be amended when such an amendment is agreed to in writing by both signatories. The amendment will be effective on the date a copy signed by both signatories is filed with the ACHP.

All attachments to this Agreement, and other instruments prepared pursuant to this agreement including, but not limited to, the maps of the APE may be individually revised or updated through consultation consistent with **Stipulation I (Timeframes and Review Procedures)** and agreement in writing of the Signatories without requiring amendment of this Agreement, unless the Signatories through such consultation decide otherwise. In accordance with **Stipulation VI (Consultations with Tribes and Other Interested Parties)** and **Stipulation VIII (Public Consultation and Public Notice)**, the Federally Recognized Tribes, and other interested parties, will receive amendments to the Project's description, any Phase I or Phase II survey reports and maps of the APE, and HPTPs, as appropriate, and copies of any amendment(s) to the Agreement.

B. Termination: Any signatory to this Agreement may terminate this Agreement. If this Agreement is not amended as provided for in **Stipulation XIII.A. (Amendments)** or if any Signatory proposes termination of this Agreement for other reasons, the Signatory proposing termination shall notify the other Signatories in writing, explain the reasons for proposing termination, and consult with the other Signatory to seek alternatives to termination, within thirty (30) calendar days of the notification.

1. Should such consultation result in an agreement on an alternative to termination, the Signatories shall proceed in accordance with that agreement and amend the Agreement as required.
2. Should such consultation fail, the Signatory proposing termination may terminate this Agreement by promptly notifying the other Signatories and Concurring Parties in writing.
3. Beginning with the date of termination, the Corps shall ensure that until and unless a new agreement is executed for the actions covered by this Agreement, such undertakings shall be reviewed individually in accordance with 36 C.F.R. § 800.4-800.6.

C. Duration: This Agreement shall remain in effect for a period of five (5) years after the date it takes effect and shall automatically expire and have no further force or effect at the end of this five-year period unless it is terminated prior to that time. No later than ninety (90) calendar days prior to the expiration date of

the Agreement, the Corps shall initiate consultation to determine if the Agreement should be allowed to expire automatically or whether it should be extended, with or without amendments, as the Signatories may determine. Unless the Signatories unanimously agree through such consultation on an alternative to automatic expiration of this Agreement, this Agreement shall automatically expire and have no further force or effect in accordance with the timetable stipulated herein.

XIV. EFFECTIVE DATE

This Agreement shall take effect on the date that it has been fully executed by the Corps and SHPO.

EXECUTION of this Agreement by the Corps and SHPO and the implementation of its terms evidence that the Corps has taken into account the effects of this undertaking on Historic Properties and afforded the ACHP an opportunity to comment.

**PROGRAMMATIC AGREEMENT
BETWEEN
THE U.S. ARMY CORPS OF ENGINEERS AND
THE ALABAMA STATE HISTORIC PRESERVATION OFFICER REGARDING
THE MOBILE HARBOR, MOBILE ALABAMA, GENERAL REEVALUATION
STUDY**

SIGNATORIES TO THIS AGREEMENT:

U.S. ARMY CORPS OF ENGINEERS, MOBILE DISTRICT

BY: *Sebastien P. Joly* DATE: *9 Jun 19*
Sebastien P. Joly, Colonel, U.S. Army Corps of Engineers, District Commander

ALABAMA STATE HISTORIC PRESERVATION OFFICER

BY: *Lee Anne Wofford* DATE: *July 26, 2019*
Lee Anne Wofford, Deputy State Historic Preservation Officer

**PROGRAMMATIC AGREEMENT
BETWEEN
THE U.S. ARMY CORPS OF ENGINEERS AND
THE ALABAMA STATE HISTORIC PRESERVATION OFFICER REGARDING
THE MOBILE HARBOR, MOBILE ALABAMA, GENERAL REEVALUATION
STUDY**

CONCURRING PARTIES:

ALABAMA STATE PORT AUTHORITY

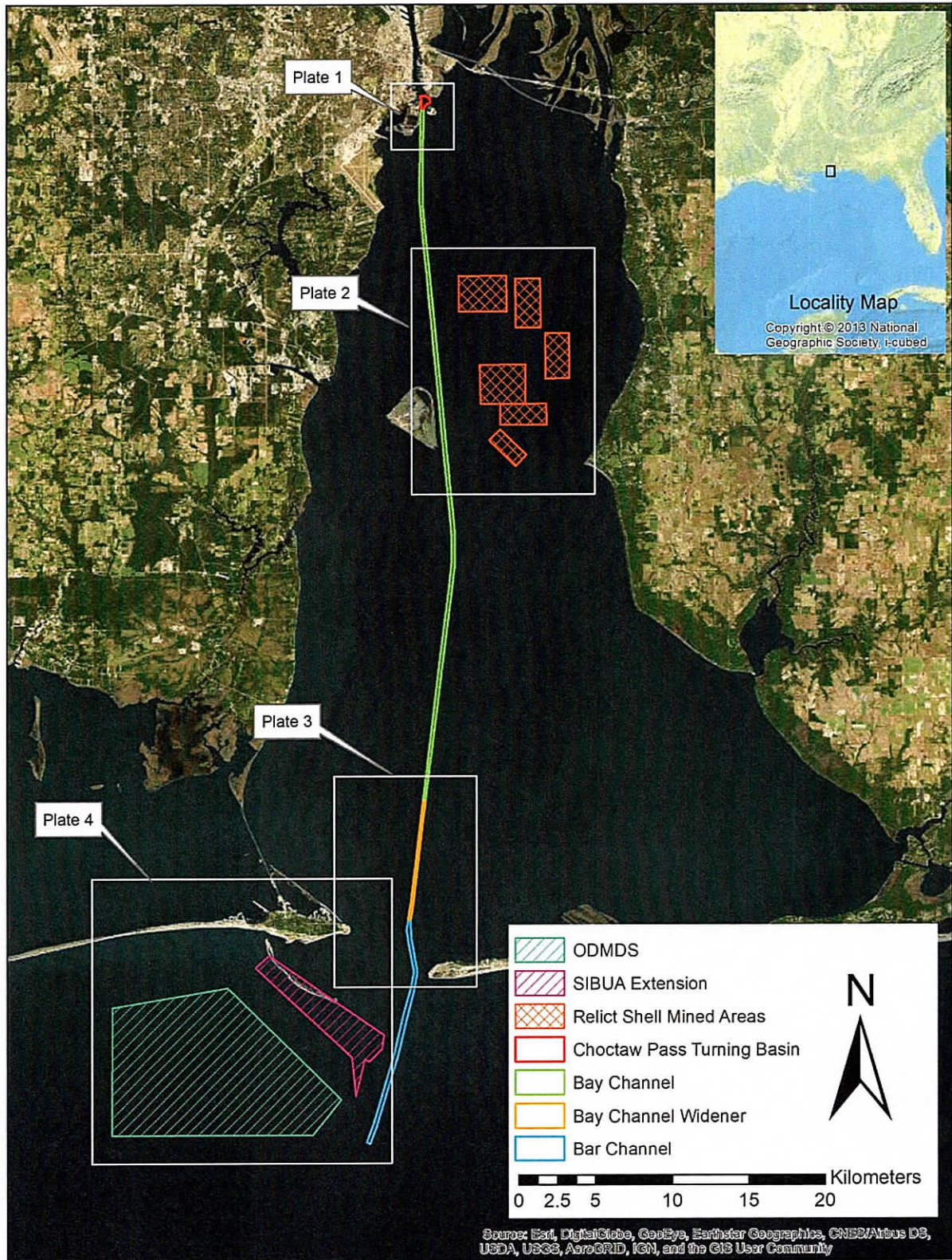
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CHOCTAW NATION OF OKLAHOMA

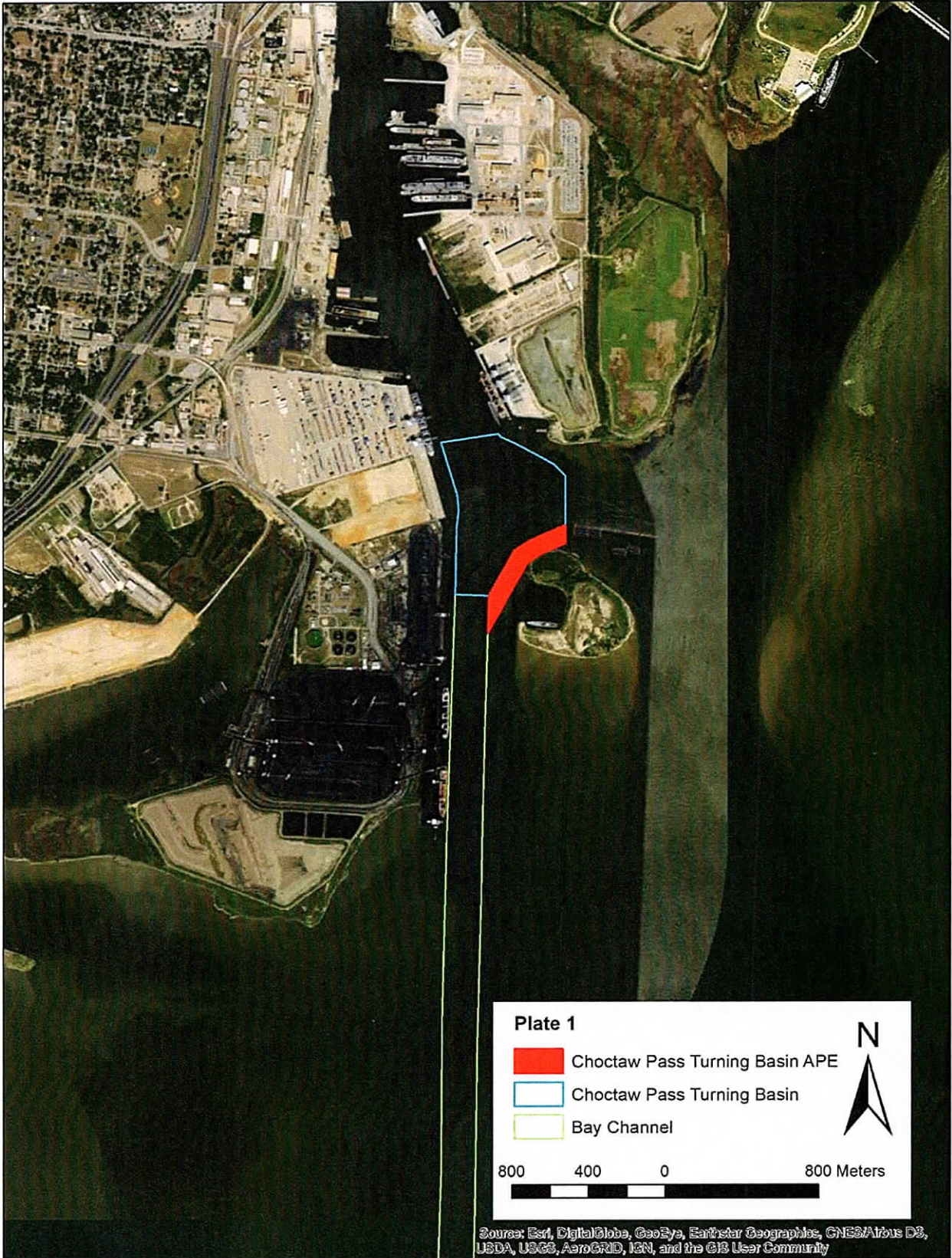
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Chief Gary Batton

MUSCOGEE CREEK NATION

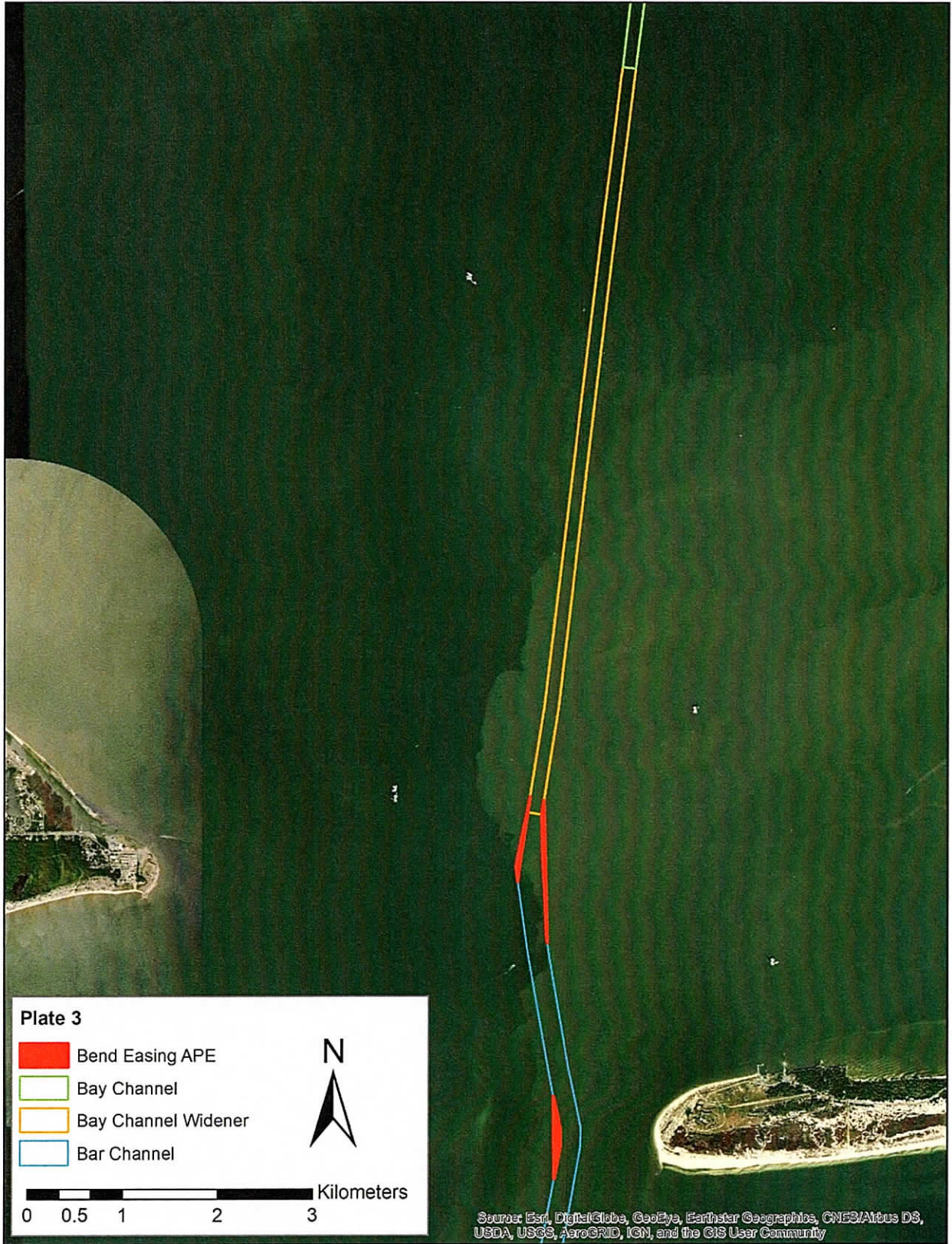
BY: _____ DATE: _____
Chief James Floyd



Overview of Mobile Harbor General Reevaluation Study project area.







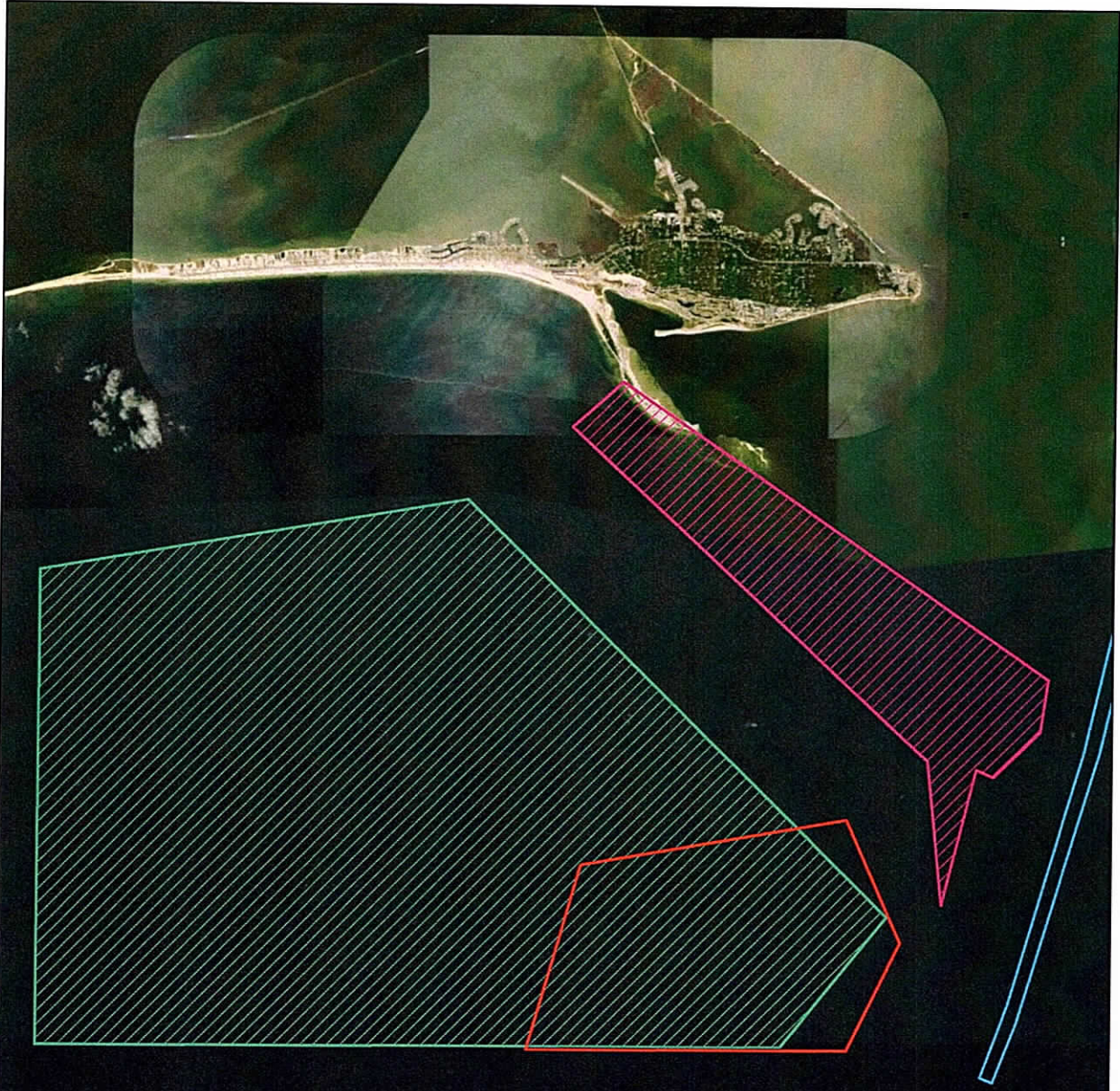






Plate 4

-  Currently Used ODMDS
-  Historic ODMDS
-  SIBUA Extension
-  Bar Channel



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community