MEMORANDUM FOR RECORD

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

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

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

1.1 Applicant: Sea Island Acquisition, LLC

1.3 Activity location: The project site is located within the surf zone of the Atlantic Ocean, along the Sea Island shoreline, in Glynn County, Georgia (Latitude: 31.1833, Longitude: 81.3310). The proposed 255-acre sand borrow area is located in the Atlantic Ocean, approximately 4 miles east/southeast of the Sea Island project area.

1.3 Description of activity requiring permit: To construct and maintain a new T-head groin south of the existing southern groin and place sand along approximately 17,000 linear feet (LF) of beach located between an existing north groin, and the proposed new T-head groin. A hydraulic cutter-head dredge would pump between 1,315,000 to 2,500,000 cubic yards (CY) of sand from the offshore source, to various locations along the beach. Temporary sand-training dikes would be constructed on the beach, and used to contain the discharge of sand and water, parallel to the shore. Once it is dewatered, bulldozers and other equipment would be used to move the sand up and down the beach, to shape the beach to the design template. Following completion of beach renourishment, sand fencing and/or native vegetation would be installed in strategic locations in the dunes in accordance with a Georgia Department of Natural Resources (DNR)-approved vegetation plan.

The project would consist of the following four reaches: Reach 1 extends 1,200' south of the southern groin (i.e. to the new groin); Reach A extends 4,000 LF north of the southern groin to approximately East 9th Street; Reach B extends

9,000 LF from East 9th Street to East 34th Street; and Reach C extends 3,500 LF from East 34th Street to the northern groin. Subsequent sand recycling activities would be accomplished with excavators, dump trucks, and other heavy equipment. Recycling activities would occur during/for the following times/reasons: (1) up to once per year outside of turtle nesting season to maintain the project; (2) at any time to correct unusual erosion rates or to correct damage caused by discrete events, upon notice to the Corps, Georgia Department of Natural Resource, Coastal Resources Division (Georgia CRD); and (3) in the event of an approaching storm, to shape dunes to raise low lying areas for upland protection, upon notice to the Corps and Georgia CRD. Material for recycling activities would be obtained from any location above mean lower low water from Reach A or Reach C.

1.3.1 Proposed avoidance and minimization measures: Refer to Section 5.

1.3.2 Proposed compensatory mitigation: The Corps has determined that compensatory mitigation is not required as the project would not result in a loss in aquatic function to a special aquatic site.

1.4 Existing conditions and any applicable project history: The project site is located within the surf zone of the Atlantic Ocean, along the Sea Island shoreline, in Glynn County, Georgia (Latitude: 31.1833, Longitude: 81.3310). A proposed 255-acre sand borrow area is located in the Atlantic Ocean, approximately 4 miles east/southeast of the Sea Island project area. Sea Island is an approximately 5-mile long barrier island that is separated from Little St. Simon's Island to the north by the Hampton River and from St. Simon's Island to the west and south by Village Creek, the Black Banks River and Gould's Inlet.

Approximately 3 miles of the shoreline has been hard armored with revetments and/or sea walls. In addition, two t-head groins and a breakwater are located along the shoreline. Based on google earth imagery, the northern groin is approximately 600 feet in length whereas the southern groin extends 500 feet.

The surf zone, which includes subtidal and intertidal areas, generally includes the area from the point at which waves are cresting off a beach to the highest point at which a wave washes on shore.

Barrier islands are constantly being shaped by a combination of natural processes such as wind, waves, and currents. Regarding the history of shoreline change on Sea Island, the applicant's agent, provided the following:

"*The history of shoreline shifting on Sea Island is in response to a number of interactive factors: sea level rise, tidal currents and wave-energy distribution, which together influence the position of the shoreline…*

Regardless of the cause of sea level rise, tidal records along the Georgia coast indicate a rise rate of about one foot per century. Long-term time scales (periods ranging from 1,000 to 5,000 years) indicate sea level rise of 10 to 50 feet. This is sufficient to inundate broad swathes of the coast and shift the shoreline landward.

During the periods of time from 250 to 500 years ago, sea level has risen 2.5 to 5 feet, respectively. To put this in historic terms, sea level was about 2.5 feet lower when Americans were declaring their independence, and sea level was about 5 feet lower when Columbus discovered the "New World". Even at these amounts of rise, the impact may be significant to the location of the shoreline.

To understand the effects of sea level rise on the Sea Island shoreline we must consider the slope of the land surface that the ocean is flooding over. In effect, the slope of the continental shelf is the record of inundated land following sea level rise, and the Georgia Coastal Plain is the surface that is yet to be flooded in the future (unless the long-term trend of sea level rise were to change). The average slopes of these two surfaces (the Georgia Coastal Plain and the Georgia continental shelf) are quite similar, both about 0.05-0.06 degrees. Thus, the rising sea may be thought of as flooding upward across this gently sloping surface during sea level rise. The average amount of landward shoreline retreat is the amount of sea level rise divided by the tan B, where B is the average slope of the plain. On an average Coastal Plain slope of 0.06 degrees the shoreline would shift about 950 feet after a one-foot rise in sea level. Put another way, one century's worth of sea level rise produces an average landward shoreline shift of 950 feet, or 0.95 feet per year. Over a period of twenty-five years it may result in a 25-foot landward shift in a shoreline.

Note that the above scenario is based on average large-scale slopes. On local scales the surface of the coastal plain is much more complex with coastal drainage networks, offshore shoals, sand bars, beaches, washover fans, estuaries, shorefaces, marshes, etc. Therefore the average rate of 0.95 feet per

year must be thought of as a long-term regional average. Locally, rates will be both higher and lower than this average. Yet it is a framework where we can begin our understanding of sea level rise as applied to Sea Island.

Sea Island is located between a major tidal inlet (Hampton River Entrance) and an intermediate sized inlet (Gould's Inlet). The major and intermediate designation is based on the relative amounts of water that pass through these inlets during tidal exchanges. The amount of water exchanged through the inlet is called the tidal prism and is a function of tidal range and the area of the marsh drainage basin. The mean tidal range is about 6.8 feet but expands to about 9.0 feet during spring phases and shrinks to just less than 5 feet at neap phases.

The Hampton River channel is entrenched in an ancient branch of the Altamaha River. The channel extends well seaward of the Little St. Simons and Sea Island shorelines and curves around to the north in front of Little St Simons Island. Griffin and Henry (1984) demonstrated that the inlet margin at Sea Island has been relatively stable since 1860 and it is not expected to migrate laterally out of the deep, ancient channel. The main axial channel of the Hampton River entrance is ebb dominated and terminates at a distal shoal several miles offshore. Hampton River has strong ebb tide currents that reach far out into the ocean during maximum ebb. The tidal discharge is much larger and stronger than those of smaller tidal drainage systems that are more strongly influenced by longshore drift. The seaward end of the channel has a large ebb delta that impacts the sediment budgets of both Sea Island and Little St. Simons Island. Millions of cubic yards of sand are stored in the bars and shoals of the ebb delta. The ebb delta is composed of two marginal shoals and one distal shoal at the end of the ebb channel. The outer parts of the ebb delta extend about 2.5 to 3 miles offshore.

The marginal shoal along the south side of the ebb channel separates the ebb-dominated channel from a flood-dominated marginal channel. This flood-dominated marginal channel is "funnel-shaped" and broadens to the southeast and pinches toward the Hampton River entrance. The flood dominance is driven by jet/plume dynamics and wave refraction. Northward flowing flood currents have been observed along the Sea Island shoreline as far as 1.35 miles south of the Hampton River entrance.

The marginal shoals themselves are often made up of sand bars separated by shallow tidal channels. In some tidal delta configurations, wave and tidal currents can provide natural nourishment to Sea Island by driving sand bars landward. However, a slight change in the configuration can also produce a negative

sediment budget that erodes material from the north end of Sea Island back toward the Hampton River. These natural patterns occur in alternating and as yet unpredictable intervals.

At the south end of Sea Island, Gould's Inlet has a small inlet and tidal prism compared to the large tidal prism of the Hampton River entrance. Even so, the Gould's Inlet ebb delta extends about 0.5 to 0.75 miles offshore, is over 1 mile wide, and contains millions of cubic yards of sand in its sand shoals and sand bars. In the 1860's, Gould's Inlet had a broad mouth (approximately 1 mile wide) (Griffin and Henry, 1984) with spits entering the inlet from both the north and the south (Figure 2). Spits on both sides of an inlet indicate that the direction of sand drift varies on either side of the inlet. This is a natural process caused by wave refraction around inlet ebb deltas. The broad opening allows for the tidal discharge to be spread across a wider area, thus decreasing its force per cross-sectional area. The result is an inlet mouth that is wider than the offshore width of the tidal delta. Over the past one hundred fifty years Gould's Inlet and its tidal delta system have moved laterally several thousand feet to the south.

An 1869 map shows there were three principal tidal drainage basins behind the barrier coast of St. Simons, as shown in Figure 2. They are from north to south respectively, Village Creek, Black Bank River and Postell Creek. At that time, Village Creek drained north to the Hampton River, whereas the smaller Postell Creek and Black Bank systems drained through Gould's Inlet. As late as 1924, there was a clear drainage divide between Village Creek and Black Bank River. It is not known how the evolution of these marsh drainage patterns has influenced the discharge (flow) history of Gould's Inlet.

The Gould's Inlet ebb delta has a tidal circulation pattern driven by alternating ebb and flood dominated channels separated by sand bars. The configuration of sand bars and channels determines the patterns of sand exchange between adjacent shores of East Beach and Sea Island. For example, in the 1950's, 1960's and 1970's as the Gould's Inlet system migrated southward, the northern shore of East Beach was eroding, and the Sea Island side of the inlet was accreting. Today, the Gould's Inlet system has a large, ebb-dominated channel pressed up against the northern tip of East Beach. The channel is held in place by the Johnson Rocks that were put there in the 1960's, and the inlet throat cannot migrate any further to the south.

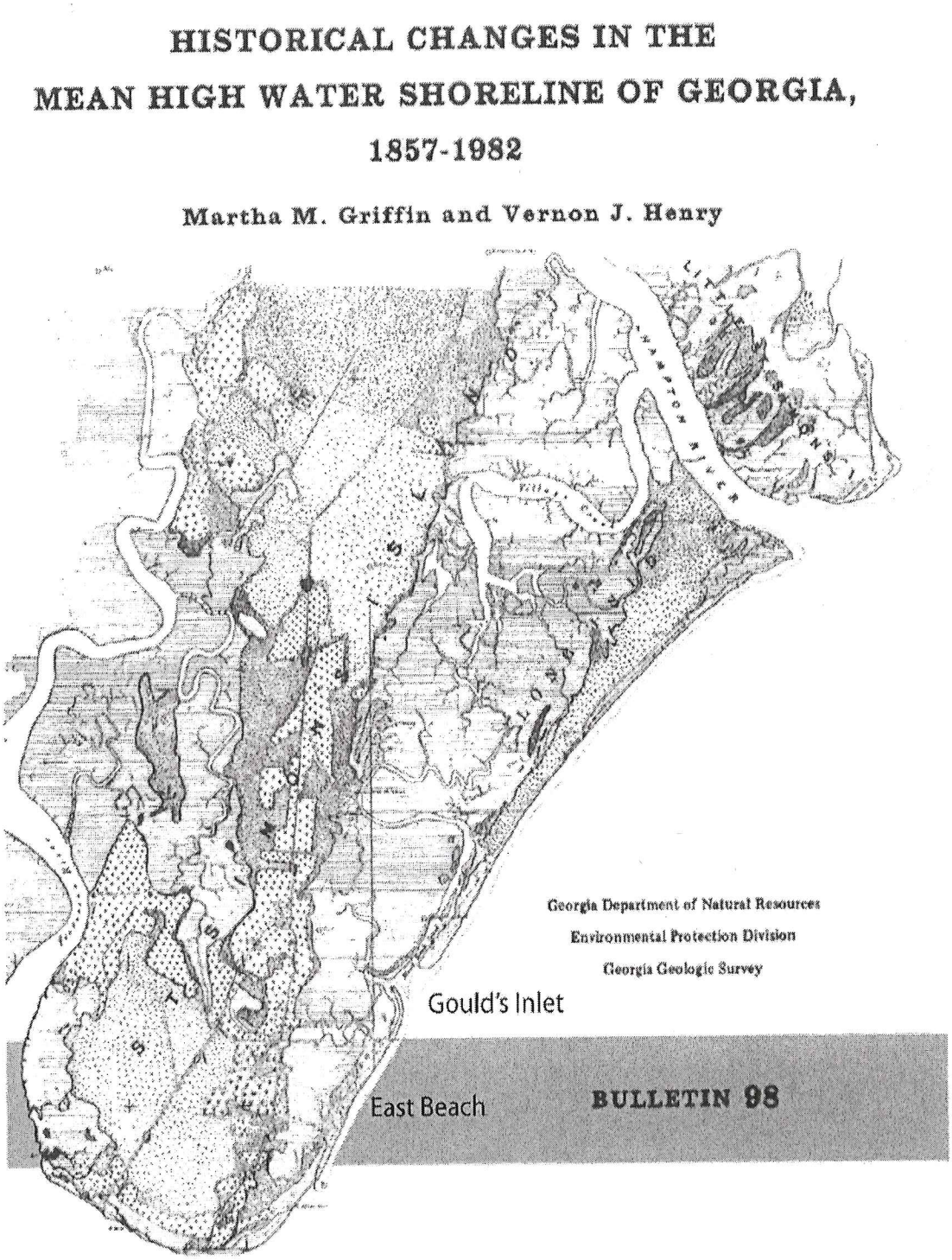

Figure 2. 1869 Map, Screen captured image from Griffin and Henry, 1984. Gould's Inlet and East Beach are labeled for this report.

In the 1990's, the main ebb channel (through the ebb delta) channel tended to be almost perpendicular to the coastline. East Beach gained sufficient quantities of sand to bury the Johnson Rocks from Gould's Inlet to the beaches south of the King and Prince Hotel, and Black Bank spit was accreting in a southerly direction. During the interval from 2003 through 2014, Google Earth imagery illustrates the dynamic nature of Gould's Inlet and adjacent shores. In 2003, the main ebb channel tended to be almost perpendicular to the coastline. This allowed for large volumes of sand to be stored in sand bars on both the north and south sides of the ebb channel. Between 2003 and 2008, a flood delta was forming on the landward side of the inlet in Black Bank channel. This changed the sediment exchange dynamics between Black Bank Spit and the ebb delta. Between 2008 and 2014, the evolving shape of the ebb delta coincided with a widening of the inlet throat and a northward migration of the tip of Black Bank spit. By 2014, the marginal shoal on the south side of the inlet was in a favorable configuration for sand migration toward East Beach.

While a cause and effect relationship has not been verified between ebb delta configuration and shoreline change, large-scale aerial observations are obvious. The amount of erosion (or accretion) attributed to inlet dynamics versus sea level rise is difficult to decipher. But it is apparent that shorelines within a couple thousand feet of Gould's Inlet, on both East Beach and Sea Island, have shifted at much higher rates than shores not influenced by ebb deltas. The amount of accretion has not been surveyed and quantified, but it appears that several millions of cubic yards of sand have accumulated naturally on East Beach, and that some parts of the shoreline have advanced seaward an average of 5-10 feet per year.

As noted above, the effects of sea-level rise on shoreline retreat are generally more important for long-term time scales. At shorter time scales (< 100 years), waves have a more direct role on shoreline shifts than sea-level rise.

Sand being transported along the shoreline by a wave-driven current is called longshore drift. The direction of longshore drift is controlled by the angle between the breaking wave crest and the shoreline. The average annual direction of wave approach for the Sea Island area is out of the east, producing a mean significant wave height of 3.6 feet, and mean peak wave period of 5 seconds (Olsen Associates, 1988). Since Sea Island has a northeast-southwest orientation, unrefracted waves coming directly onshore out of the east tend to set up a southerly longshore transport. These currents do not cause erosion or accretion, it is the gradients in these currents that can cause erosion or accretion. For example, if you consider a specific section of beach where waves carry 10 buckets of sand onto that beach and then 10 buckets of sand out of that beach,

there is no gradient. Under this scenario that beach does not change. However, if 10 buckets leave the south side of that beach and 10 buckets leave the north side of that beach, there is a gradient with a deficit. These gradients in longshore drift are caused by wave refraction.

The shallow continental shelf and large inlet shoal systems tend to refract (bend) waves as they approach the shoreline. At the northern end of Sea Island waves refract around the ebb delta and bend clockwise and northward along the Sea Island shoreline. At the southern end of Sea Island waves refract around the Gould's Inlet tidal delta and bend counter clockwise and southward toward Gould's inlet. From an island-wide perspective, wave-driven currents diverge away from the center of Sea Island toward the inlets. This produces a long-term sediment deficit at the central Sea Island beaches that is additive onto the long-term effects of sea level rise.

Griffin and Henry (1984) documented amounts of shoreline shift as of 1980, observed from historic charts. Over the 120-year period between 1860 and 1980, Griffin and Henry (1984) showed periods of shoreline recession and accretion along various sections of Sea Island's ocean shoreline.

Using Griffin and Henry's data, Olsen Associates (1988) converted shift amounts into shoreline-shift rates for six sections of Sea Island (as shown in Figure 3) at four different time intervals based on historic map availability (1860 to 1924, 1924 to 1955, 1955 to 1974 and 1974-1980). Note that the time intervals between surveys varied greatly in length. The period from 1860 to 1924 spanned 64 years, the period from 1924 to 1955 spanned only 31 years. Between 1955 and 1974 only 19 years elapsed and between 1974 and 1980 only 6 years elapsed. The Griffin and Henry data have been summarized in tabular form by Olsen Associates (1988), as shown in Figure 4.

Several important things stand out in a review of this historic data. Prior to 1974 the data illustrate that the shoreline at the northern part of Sea Island was retreating landward at about 15 to 20 feet per year and the central part of the island was relatively stable. The Griffin and Henry data illustrate that the Sea Island spit was considerably more dynamic with two periods of rapid (> 60 feet per year) seaward shoreline shifts, or accretion. One occurred between 1860 and 1924 and the other between 1955 and 1974. The intervals between these rapid changes were noticeably quieter. All of these fluctuations in shoreline position occurred well before any engineering work was done at the Sea Island shoreline. Using profile data from Oertel, Olsen Associates (1988) constructed a table of MLW shoreline change rates for the period 1979 to 1988 for the 28 profile locations shown in Figure 5. These rates were based on actual survey data collected on the beaches. During the period 1979 to 1988, the maximum rate of shoreline shift (-17.7 feet per year) occurred in the central island shoreline. The second highest rate (-14.7 feet per year) occurred toward the

south end of Sea Island (Fig. 5 Profile Group F). At the same time, Black Bank spit (Profile Group G) was elongating at 80 feet per year, and the most northern part of the island was retreating at about 10 feet per year.

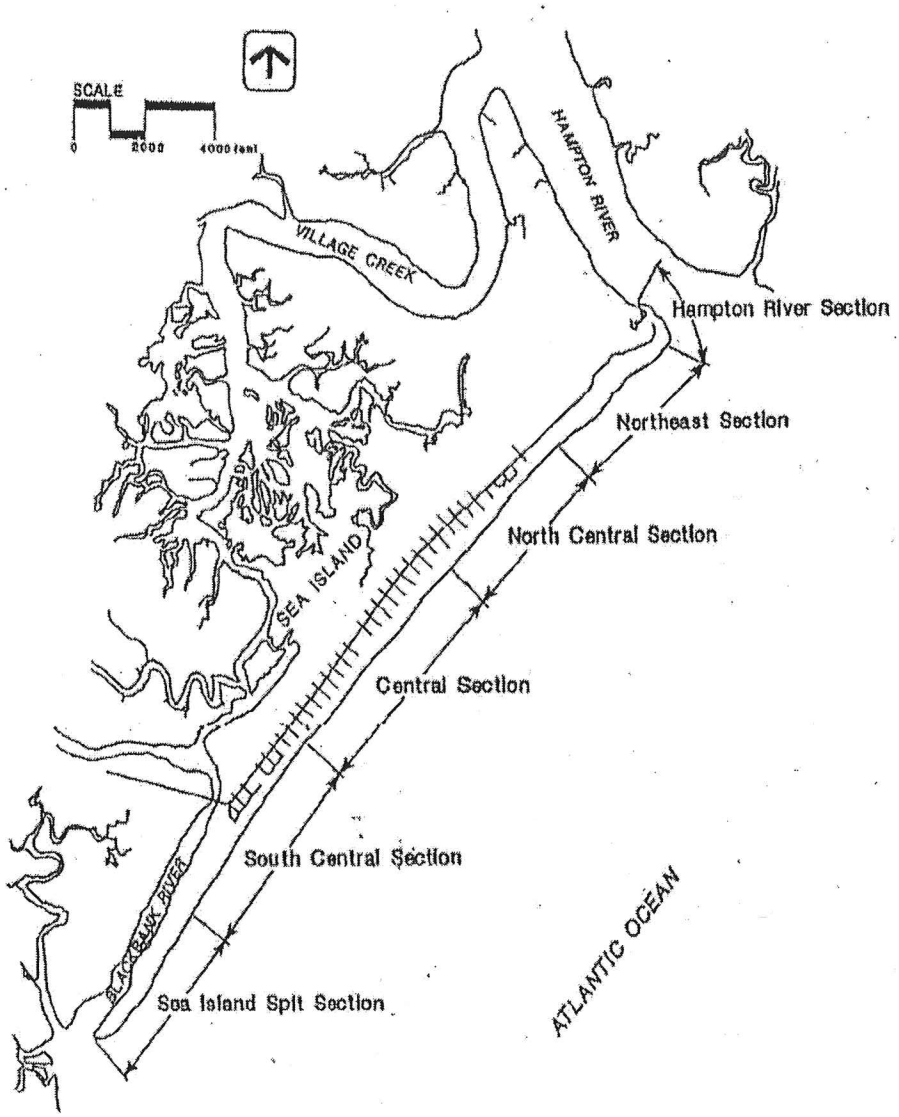

Figure 3. Six shoreline sections for change rates in Figure 4 (Olsen, 1988)

TABLE 4-1: SEA ISLAND MHW SHORELINE CHANGE RATES (ft/yr)
(Source: Griffin & Henry, 1984)

Time Interval	Hampton River	Northeast	North Central	Central	South Central	Sea Island Spit
1860-1924	-5.0	-30.8	0	3.1	3.9	69.4
1924-1955	19.4	-20.0	-15.3	-6.5	-8.1	6.1
1955-1974	11.6	-18.4	-16.8	0	-5.2*	64.5
1974-1980	-8.3	0	-18.7	0	-13.3	-0.1
Section Weighted Averages	3.8	-24.5	-7.5	-0.1	-1.5	48.8

* Shoreline was armored during this time interval.

Figure 4. Tabular presentation of shoreline shift data in Olsen (1988).

More recent analyses (Oertel, 2012) of beach profile surveys from the south end of Sea Island (between profiles 23-28 in Figure 5) for the 18-year period between 1990 and 2008 illustrate MHW and MLW recession rates of about -9.6 ft/yr and -3.3 ft/yr, respectively. During the 4-year interval between 2008 and 2012 the MHW shift rate was about -2.8 feet per year.

Aerial photos (e.g. Google Earth) can also be employed to estimate shoreline change. But analyses of short-time intervals between aerial photographs can be misleading, particularly when tidal stages are not known. High-tide lines (shorelines) on aerial photographs must be deduced from light/dark patterns on images and at best only represent the high tide of that day. Photos rarely coincide with periods of mean high water (MHW), which is an 18.6 year average of high tides. In that regard, even the most precisely deduced high-tide shorelines from aerial photography are at best high-tide shorelines of that day. Since there is the natural variation of high water between spring and neap tides, the range may vary between 3-4 feet, and high-water shorelines on these low sloping beaches may be many 10's of feet away from a surveyed mean high water (MHW) shoreline. Also, if an aerial photograph happened to follow a

particular stormy period of northeastern storms, beach recovery may not have occurred. The use of survey data can be used to standardize shorelines to MHW. Long time intervals between measurements at fixed shoreline positions tend to reduce the impacts of short-term anomalies in data.

After considering data from Griffin and Henry (1984), Olsen (1988), and Oertel (1990- 2012) it is clear there have been real fluctuations in the rates of shoreline shift on Sea Island. Rates ranged from -3 feet per year for long-term averages to -10 feet per year. If we plan to project these rates into the future, it would be advisable to use long-term rates, not short-term intervals."

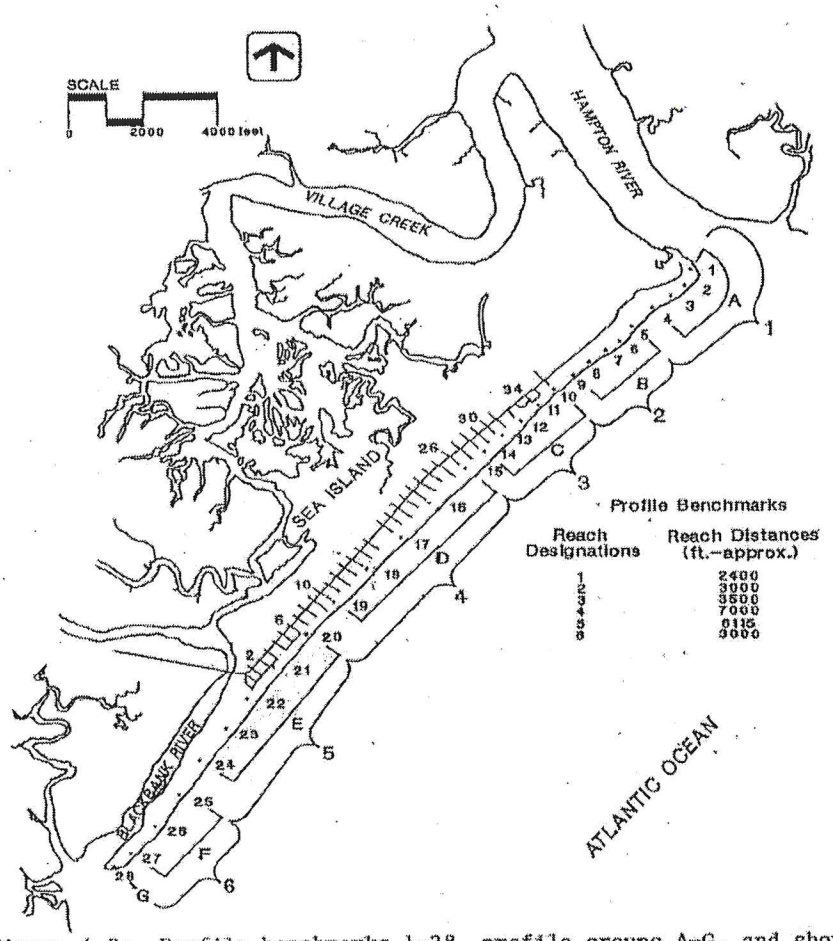

Figure 4-2: Profile benchmarks 1-28, profile groups A-G, and shoreline reaches 1-6, utilized to describe the analysis of survey data measured along Sea Island.

TABLE 4-2: SEA ISLAND MONITORING STUDY; MLW SHORELINE CHANGE RATES (ft/yr)

	Profile Group						
	A	B	C	D	E	F	G
November 1979-April 1988*	-10.3	-5.9	1.4	-17.7	-10.2	-14.7	80.9

*Shoreline was armored during this time interval.

Figure 5. Map of shoreline reaches of Sea Island with table of MLW-shoreline shifts rates for the period 1979-1988 (Olsen, 1988).

According to the applicant, shoreline retreat has been occurring at varying rates along the Sea Island shoreline since at least 1860 and has undergone numerous cycles of erosion and accretion. By the 1970's, the waves were eroding property along the shoreline and property owners began hard armoring the shoreline

through the placement of rock and/or concrete revetments. By the mid 1980's revetments armored approximately 3 miles of the Sea Island shoreline. According to the applicant, the revetments halted the shoreline retreat but the beach continued to erode and by the late 1980's there was no high tide beach for many areas of the Sea Island shoreline. As a result, three beach renourishment events were conducted between 1986-1997 and in the early 1990's two t-head groins were constructed to retain the nourishment volume on Sea Island.

Project History: The Corps has issued several DA permits since the mid-1980s authorizing the construction (and extension) of the existing groins as well as to perform beach renourishment activities (i.e. pumping sand from offshore locations and/or sand recycling maintenance events). For a complete project history, please see Attachment A of this document.

1.5 Permit Authority: Section 10 of the Rivers and Harbors Act (33 USC 403) and Section 404 of the Clean Water Act (33 USC 1344).

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

2.1 Determination of scope of analysis for National Environmental Policy Act (NEPA):

The scope of analysis includes the specific activity requiring a Department of the Army permit. Other portions of the entire project are included because the Corps does have sufficient control and responsibility to warrant federal review.

Final description of scope of analysis: The Corps has determined that the NEPA scope of analysis is the entire 5-mile shoreline of Sea Island (i.e. from the Hampton River to Gould's inlet) as well as the offshore borrow site.

2.2 Determination of the "Corps action area" for Section 7 of the Endangered Species Act (ESA): The Corps has determined that the ESA action area is the entire 5-mile shoreline of Sea Island (i.e. from the Hampton River to Gould's inlet) as well as the offshore borrow site.

2.3 Determination of permit area for Section 106 of the National Historic Preservation Act (NHPA):

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

Final description of the permit area: The Corps has determined that the permit area is the entire 5-mile shoreline of Sea Island (i.e. from the Hampton River to Gould's inlet) as well as the offshore borrow site.

3.0 Purpose and Need

3.1 Purpose and need for the project as provided by the applicant and reviewed by the Corps: The Applicant's stated purpose and need is "to restore the Sea Island (GA) beach to provide storm protection for adjacent uplands, restore wildlife habitat, restore recreational functions, and to provide a reservoir for sand recycling to address existing erosion patterns."

3.2 Basic project purpose, as determined by the Corps: Based on the above need and purpose statement, as well as information provided by the applicant, the Corps has determined that the basic purpose of the proposed project is storm protection.

3.3 Water dependency determination: N/A, activity is not located in a special aquatic site.

3.4 Overall project purpose, as determined by the Corps: The Corps has determined that the overall project purpose is to protect upland lots and development located along the shoreline of Sea Island from storm damage.

4.0 Coordination

4.1 The results of coordinating the proposal on Public Notice (PN) are identified below, including a summary of issues raised, any applicant response and the Corps' evaluation of concerns.

On October 15, 2015, Sea Island Acquisitions submitted a Department of the Army (DA) application requesting authorization to construct a T-head groin and create a dune ridge and 150' wide beach by discharging sand between the proposed groin and the existing southern groin. The sand would be excavated from the existing catchment basins located adjacent to the northern and southern groins. On December 18, 2015, the Corps published a PN advertising the above project.

On March 6, 2018, the applicant amended the above application. Specifically, the amended application included the construction of the T-head groin as well as beach renourishment activities along 17,000 linear feet of the Sea Island shoreline (i.e. from the existing northern groin to the proposed T-head groin). In addition, all sand utilized for the project would be hydraulically dredged from an offshore borrow site and pumped onto the Sea Island beach including the area between the proposed groin and existing southern groin. Due to the changes above, the Corps published an addendum to the original PN on March 20, 2018, readvertising the project. Below are comments received in response to both PNs as well as the applicant's responses and the Corps' evaluations.

Were comments received in response to the PN? Yes

Were comments forwarded to the applicant for response? Yes

Was a public meeting and/or hearing requested and, if so, was one conducted? Yes, a public meeting/hearing was requested but was not held.

Several commenters expressed concerns regarding the effects the existing groins have had on the spit, Gould's Inlet, and the Black Banks River as well as the potential effects the new groin would have on the above areas. One commenter provided the written testimony of Dr. Chester Jackson and Dr. Bret Webb from the Georgia Office of State Administrative Hearings (OSAH) regarding the historical change of the Sea Island shoreline before and after the current groins were constructed. Several commenters expressed concerns regarding the effects the proposed project would have on St. Simons Island (including East Beach) and the Golden Isles. One commenter expressed concerns regarding the potential effect the project would have on the tourism industry of St. Simons Island. In addition, several commenters expressed concerns regarding the effects the proposed project would have on the sand sharing system of the Golden Isles.

Applicant's Response: "Prior to groin construction, Sea Island was armored and waves were lapping on the revetment. With no sand to pull and carry along the shoreline, there was no sand source updrift of the groins to supply the adjacent areas. The sand lying within the groins is the result of the Sea Island nourishment project, where over a million cubic yards of sand was pumped from an offshore source onto the area between the groins. Therefore, the sand present between the groins today was not captured and prevented from drifting down the beach, and thus the current condition of the areas south of the existing groin is due to the lack of shoreline protection, not from the existing groins. Even if the existing south groin were contributing to erosion to the south, those impacts

would be ameliorated by the project, as has been explained by David Basco, P.E., PhD. in his testimony in the appeal of the Shore Protection Committee permit and as found by the Administrative Law Judge."

Regarding the potential effects the existing groins have had and the new groin may have on Gould's Inlet and the Black Banks River, the applicant stated, "The proposed project will have no effect on the Black Banks River or Gould's Inlet. The shoreline dynamics that form the Inlet are discussed in detail in the report submitted as Attachment D to the application, produced by George F. Oertel, PhD and David Basco, PhD/PE titled *Sea Island Beaches Shoreline Dynamics and Erosion-control Projects* dated July 2015. The proposed project is too small (120,000 yds3) and too far away to influence the dynamics of the Inlet or the Black Banks River, which has millions of cubic yards of sand contained in its shoals."

Corps Evaluation: Based on information provided in the above report, multiple processes (including the construction of the existing groins) have contributed to the Island's current sand deficit and shoreline erosion, including at the Spit.

According to the applicant, shoreline retreat has been occurring at varying rates/times along the Sea Island shoreline since at least 1860. By the 1970's, the waves were eroding property along the shoreline and as a result, property owners began hard armoring the shoreline through the placement of rock and/or concrete revetments. By the mid 1980's revetments armored approximately 3 miles (60%) of the Sea Island shoreline. This hard armoring halted the shoreline retreat, however it did not restore the high tide beach in these areas. As stated in the Corps' Coastal Engineering Manual (CEM), "coastal armoring is designed to protect the upland, but does not prevent erosion of the beach profile...Thus an eroding beach will continue to erode. If the armoring had not been placed, the width of the beach would have remained relatively the same, but with increasing time, would have been located progressively landward." Given the above, it appears that the Sea Island shoreline at that time was experiencing erosion/shoreline retreat due to natural processes and would continue to erode with or without armoring.

The absence of a high tide beach reduces the amount of sediment along the shoreline and subsequently the amount of sediment available to be redistributed by waves and the longshore drift (i.e. moved downdrift to the spit). In addition, hardened structures do not absorb energy from incoming waves. Instead, these structures tend to deflect (or displace) the energy onto the adjacent shorelines and as a result erosion often occurs downdrift and/or up drift of the structures. Therefore, the hard armoring of the shoreline has also contributed to the sand deficit and erosion of the Island.

During the evaluation of the application, Savannah District solicited

Mr. Kevin Conner, a coastal engineer in the Wilmington District, to complete an independent review of the above report by Oertel and Basco in conjunction with the following reports provided by the public: (1) *Impacts to Sea Island's Sand-Sharing System and Alternative Shore Protection Methods*, prepared by Bret M. Webb, Ph.D., P.E., D.CE; and (2) *Summary of Historical Shoreline Change for the Sea Island, Georgia's South Groin Region, 1869 to 2013*, prepared by Chester W. Jackson, Jr., Ph.D.

Mr. Conner's review concluded that the existing T-head groins are currently trapping some of the material (sand, silt, clay, etc.) that is naturally coming from the north, and moving south. The southern end of the spit is currently eroding and would continue to erode as long as the existing groin system remains in place. Therefore, regardless of whether the new proposed groin is constructed, the existing hard armoring (which has been in place to some extent since the 1980's) would continue to contribute to the erosion of the spit. Furthermore, the area between the southern groin and proposed new groin represents only an 8 percent increase, when compared to the area currently between the northern and southern groins. According to Mr. Conner, it is unlikely that the construction of a new shorter groin just south of the existing southern groin will interrupt sediment transport in any measurable way under the current system.

Since receipt of the above comments (and subsequent response from the applicant), the application was amended to include the construction of the groin and renourishment of 17,000 linear feet of Sea Island shoreline. The renourishment would consist of hydraulically dredging 1.3 to 2.5 million CYs of sand from an offshore borrow site, and pumping it onto the existing beach between the northern groin and the new proposed groin. Therefore, the project would introduce between 1.3-2.5 million CYs of sand from an offshore source into the groin field, and subsequently supplement the sand sharing system. It is likely that the introduction of this additional sand would allow the beach between the groins to eventually reach an equilibrium state and thus allow some sand to bypass the groins and travel downdrift to the spit and potentially to St. Simon's Island, including East Beach.

In addition, any draft permit issued for the proposed project would include requirements to monitor sand movement within the southern groin and proposed new groin as well as down drift of the groins. This monitoring would be accomplished through extensive surveying of the shoreline in these areas both pre and post construction. Should the monitoring/surveying indicate that the new groin is trapping sand, the applicant would be required to submit a corrective action plan (i.e. sand bypass, adjustment/removal of the new groin, etc.). For specific monitoring requirements, refer to section 11.

One commenter stated that "groins are widely known to cause accelerated downdrift erosion and are largely disfavored as a result." The commenter goes

on to quote excerpts from the Corps of Engineers' Coastal Engineering Manual. Specifically, the commenter states "The Corps' own Coastal Engineering Manual describes groins as "probably the most misused and improperly designed of all coastal structures " and explains that "[c]oastal structures such as ... groins ... are probably the most dramatic cause of man-induced coastal erosion." *See* USACE Manual at IV-1-7; V-3-59. It should come as no surprise, therefore, that the Manual goes on to recognize that "[c]oastal zone management policy in many countries and the United States presently discourages the use of groins for shore protection." *Id.* at V-3-61."

Applicant's Response: "Despite the comments criticizing the use of groins generally, the Corps' Coastal Engineering Manual (CEM) clarifies that "[m]odern coastal engineering practice is to combine beach nourishment with groin construction to permit sand to immediately begin to bypass the groin field." CEM at V-3-59 to -61...The CEM further states that groins should be considered in various shoreline protection scenarios, including: "To reduce the loss of beach fill, but provide material to downdrift beaches in a controlled manner." *Id.* at V-3-61. The CEM also notes that in evaluating the functional properties attributed to groins, it is accepted practice that groin fields should be filled, and explaining that groin fields should be tapered if located adjacent to an unprotected beach. *Id.* Table V-3-8 at 68. Thus, the proposed groin must be evaluated in the context of its use and design as well as the surrounding conditions to determine whether the proposed use is consistent with accepted Corps practice.

The use of the groin in this case is to satisfy the immediate project purpose of upland storm protection in conjunction with beach nourishment. While groins constructed and designed to simply trap existing sand and not in conjunction with beach nourishment activities may be disfavored, that is not the case when a groin is installed in conjunction with a beach nourishment project.

The use of groins in conjunction with beach nourishment has proved successful along the Georgia coast. Although the coast of Georgia has 15 recognized barrier islands, only four are developed and have vehicular access. Of those islands with vehicular access, only Tybee Island and Sea Island have conducted beach nourishment projects, and both those islands have obtained authorization to build groins (and have installed groins) in conjunction with beach nourishment projects. The Tybee nourishment projects have been federal projects implemented by the Corps.

In this case the proposed project design meets modern engineering practices for groin construction and will be combined with an extensive beach nourishment project. As a result, allegations as to the potential negative effects of improperly constructed groins are misplaced. While certain experts have opined that improperly designed groins may have adverse effects, properly designed groins can in fact mitigate adverse effects as recognized by other coastal scientists as

referenced in the CEM and other scientific literature. *See* Science and Technology Committee, American Shore & Beach Preservation Association, *Reintroducing Structures for Erosion Control on the Open Coasts of America* (Jan. 2011) (Attachment D).

As set forth in the Supplemental Comments of David R. Basco, PhD, PE—not only a noted coastal engineer but also the author of the chapter in the Corps' CEM addressing shore protection projects—the CEM recommends use of tapered (shorter length) groins at the end of a groin field to aid in the transition of sand bypassing the last groin and returning to the downdrift beach. Basco Supplemental Comments § 5.3 (Attachment B). As Dr. Basco has stated: "The groin in the . . . Project creates a tapered groin system extending from the existing south groin." *Id.* As designed, "the beach fill template extends seaward of the end of the groin to insure sand bypassing of the groin." *Id.* In addition, the new rock groin will be "leaky," which will allow sand to move downdrift."

Corps' Evaluation: The Corps is satisfied with the applicant's response. In addition, it appears that the erosion occurring along the Sea Island shoreline is the result of a combination of multiple processes and factors. Specifically, the Sea Island spit is currently sand starved and eroding as a result of a combination of natural processes (i.e. sea level rise, wind, waves, etc.), the past hard armoring of the shoreline (i.e. existing sea walls, revetments and groins) and insufficient inputs of sand into the Sea Island beach system.

As stated above, Mr. Conner's review concluded that the existing T-head groins are currently trapping some of the material (sand, silt, clay, etc.) that is naturally coming from the north, and moving south. The southern end of the spit is currently eroding and would continue to erode as long as the existing groin system remains in place. Therefore, regardless of whether the new proposed groin is constructed, the existing hard armoring (which has been in place to some extent since the 1980's) would continue to contribute to the erosion of the spit. Furthermore, the area between the southern groin and proposed new groin represents only an 8 percent increase, when compared to the area currently between the northern and southern groins. According to Mr. Conner, it is unlikely that the construction of a new shorter groin just south of the existing southern groin will interrupt sediment transport in any measurable way under the current system.

In addition, any draft permit issued for the proposed project would include requirements to monitor sand movement within the southern groin and proposed new groin as well as downdrift of the groins. This monitoring would be accomplished through extensive surveying of the shoreline in these areas both pre and post construction. Should the monitoring/surveying indicate that the new groin is trapping sand, the applicant would be required to submit a corrective

action plan (i.e. sand bypass, adjustment/removal of the new groin, etc.). For specific monitoring requirements, refer to section 11.

Several commenters opposed the project stating concerns over the project's potential to result in adverse effects to wildlife, including threatened and endangered species.

Applicant's Response: Regarding threatened and endangered species, the applicant's agent provided a biological assessment documenting that the following species may be within or near the project site: Green sea turtle (*Chelonia mydas*), Hawksbill sea turtle (*Eretmochelys imbricata*), Leatherback sea turtle (*Dermochelys coriacea*), Loggerhead sea turtle (*Caretta caretta*), Kemp's Ridley sea turtle (*Lepidochelys kempii*); Piping Plover (*Charadrius melodus*), Red knot (*Calidris canutus rufa*), Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*), Shortnose Sturgeon (*Acipenser brevirostrum*), West Indian Manatee (*Trichechus manatus*), and the North Atlantic Right Whale (*Eubalaena glacialis*). In addition, critical habitat for the Piping plover has been designated both north and south of the project area and critical habitat for the North Atlantic right whale has been designated adjacent to and east of the project area.

Corps Evaluation: The potential effects to threatened and endangered species, critical habitat and wildlife have been evaluated in Sections 6.4.1 and 7 below.

Several commenters expressed concerns regarding the financial stability and ownership of the Sea Island Acquisitions.

Applicant's Response: "No legal basis for requiring a bond has been identified, and no need for such has been shown. Sea Island Acquisitions, LLC, as well as its predecessor the Sea Island Company, has consistently met its obligations to comply with the conditions of Corps permits. Ownership of the applicant has recently been consolidated into one family, which provides additional stability, continuity and long-term commitment to the company. Compliance with all Department of the Army permits is required as part of both general and special conditions to each permit, and the permittee is liable to comply and adhere to such conditions."

Corps Evaluation: The Corps is satisfied with the agent's response.

Several commenters expressed concerns about the authorization of a project in the public trust for a private project and a barrier island that is not accessible to the public.

Applicant's Response: "Shoreline protection projects are recognized in numerous sections of current Department of the Army regulations. Remedies available to landowners can be authorized both by General Permit [Nationwide Permit 13 (NWP 13)] and by Standard Permit for those projects that exceed General Permit thresholds. In the decision document prepared for NWP 13 for compliance with the National Environmental Policy Act (NEPA) and impact analysis under Subparts C through F of the 404(b)(1) Guidelines (40 CFR Part 230), a landowner's right to protect their property is clearly stated. In Section 1.4 of said document in the discussion of Public Comments and Response, page 5: Coastal and riparian areas are dynamic landscapes. They are constantly changing as a result of erosional and depositional processes. Landowners seek Department of the Army authorization for bank stabilization activities to protect their property and provide safety. The purpose of NWP 13 activities is to protect land on which residences, commercial buildings, infrastructure, and other features are located. The Corps regulations recognize that a riparian landowner has a right to protect his or her property from erosion (see 33 CFR 320.4(g)(3)). [emphasis added]

In the referenced section of 33 CFR Part 320.4(g), the ability of a landowner, both public and private, to protect their property is further supported:

(g) Consideration of property ownership. Authorization of work or structures by DA does not convey a property right, nor authorize any injury to property or invasion of other rights.

(1) An inherent aspect of property ownership is a right to reasonable private use. However, this right is subject to the rights and interests of the public in the navigable and other waters of the United States, including the federal navigation servitude and federal regulation for environmental protection.

(2) Because a landowner has the general right to protect property from erosion, applications to erect protective structures will usually receive favorable consideration. However, if the protective structure may cause damage to the property of others, adversely affect public health and safety, adversely impact floodplain or wetland values, or otherwise appears contrary to the public interest, the district engineer will so advise the applicant and inform him of possible alternative methods of protecting his property. Such advice will be given in terms of general guidance only so as not to compete with private engineering firms nor require undue use of government resources.

(3) A riparian landowner's general right of access to navigable waters of the United States is subject to the similar rights of access held by nearby riparian landowners and to the general public's right of navigation on the water surface. In the case of proposals which create undue interference with access to, or use of, navigable waters, the authorization will generally be denied. [emphasis added].

It is clear that the applicant has a fundamental right to protect their upland property and therefore should receive favorable consideration of their proposal, provided that the proposed project is not contrary to the public interest.

Sea Island acknowledges that the State owns the beach below the mean high water mark, which moves with accretion and erosion. While there is no public access to the beach on Sea Island from the upland (just as there is very limited and controlled access to most of Georgia's barrier islands), there is an unfettered right for any person to land a boat on the beach at Sea Island. Kayakers routinely paddle down Postell Creek or Black Bank River, land at the Spit, and walk along the Sea Island beach. There is no effort to interfere with that use now, and there will be none after construction of the proposed project. One commenter questions whether issuing a permit for this project—construction of a perpendicular groin and beach renourishment--is an appropriate use of the State-owned foreshore and water bottoms. That objection has been foreclosed by enactment of the Shore Protection Act (originally entitled the Shore Assistance Act) and a decision of the Georgia Supreme Court affirming permits issued pursuant to the Act.

Passage of the Shore Assistance Act (the "Act") was prompted by severe erosion on Sea Island in the 1960s and 1970s. Revetments had been constructed along the Sea Island beach as early as the mid-1960s, and the State took steps to regulate these activities. The Act was passed in 1979 and requires a permit for any structure, shoreline engineering activity or land alteration within the "dynamic dune field," which extends to the ordinary high water mark, or on lands below the high water mark. O.C.G.A. § 12-5-237. The Act set up a Committee to review and act on applications for permits, .C.G.A. § 12-5-235, and established procedures and standards by which such permits would be evaluated. O.C.G.A. § 12-5-239. The Act clearly contemplates the issuance of permits for shoreline engineering projects on State-owned land to protect private property, and directs the Committee to consider the public interest, defined to mean whether there will be unreasonably harmful alteration of the dynamic dune fields, submerged lands or the sand-sharing system, unreasonable interference with the conservation of marine life, wildlife or other resources, or unreasonable interference with reasonable access and recreational use and enjoyment of public properties impacted by the project. The General Assembly has thus authorized this use of State-owned property, if a permit is properly issued by the Committee.

Shortly after passage of the Act, dozens of permits were issued for shoreline engineering projects on Sea Island, commencing with revetments to protect individual property owners to halt the alarming recession of the beachfront. Later, the Sea Island Company undertook projects to restore and renourish the beach. After several attempts with small renourishment projects and short groins, in 1990 Sea Island obtained permits to dredge more than a million cubic yards of

sand to renourish the beach and to construct terminal groins to hold the sand in place. Along with permits from the Shore Protection Committee and the Corps of Engineers, Sea Island also secured a mineral lease from the State of Georgia and paid for the sand that was pumped onto the Sea Island beach. Sea Island also obtained a "revocable license" from the State of Georgia to encroach on State-owned land below the high water mark. That project was extremely successful and continues to this day to protect...property as well as creating recreational beach and wildlife habitat.

The present project is merely a small extension to the south of the...Sea Island beach renourishment project, anchored by two groins. The project will include a new, shorter groin to the south, and renourishment of the beach between the new groin and the existing south groin. The material used for renourishment will not be dredged from offshore but will be moved from the catchment basin of the existing project; it is material previously dredged and previously paid for pursuant to a mineral lease from the State.

The authority of the Committee to issue permits for shoreline engineering activities that extend onto state-owned property was challenged and upheld by the Georgia Supreme Court in the case of Rolleston v. State of Georgia, 245 Ga. 576 (1980). As the Supreme Court noted, "the General Assembly clearly contemplated that under the Act, the Shore Assistance Committee could issue permits involving the state's property." Id. at 581. That case also rejected a challenge to the revocable licenses issued by the State to allow the construction of revetments on State property. In that case, as in this application, the permitting of some limited use of State-owned property is a reasonable and permissible decision by the State, when it is needed to protect private property and where it does not unreasonably damage the sand-sharing system, unreasonably harm wildlife, or unreasonably interfere with reasonable access to and recreational use of public properties.

For this project the Shore Protection Committee has issued a permit, which was upheld by an Administrative Law Judge of the Office of State Administrative Hearings and, subsequently, by the Superior Court of Fulton County."

Corps Evaluation: The Corps is satisfied with the applicant's response. Since receipt of the above comments/applicant response, the application was amended to include the construction of the groin and renourishment of 17,000 linear feet of Sea Island shoreline. The renourishment would consist of hydraulically dredging 1.3 to 2.5 million CYs of sand from an offshore borrow site, and pumping it onto the existing beach between the northern groin and the new proposed groin. Although the project was amended, it does not change the Corps evaluation of the response.

In addition, Georgia Department of Natural Resources, Coastal Resources Division, (Georgia DNR, CRD) issued a separate shoreline protection act permit for the additional renourishment and hydraulic dredging of the material from the offshore borrow site.

One commenter expressed concern about boating access out of Gould's inlet.

Applicant's Response: "The proposed project will have no effect on boating access in Gould's Inlet. The shoreline dynamics that form the Inlet are discussed in detail in the report submitted as Attachment D to the application, produced by George F. Oertel, PhD and David Basco, PhD/PE titled *Sea Island Beaches Shoreline Dynamics and Erosion-control Projects* dated July 2015. The proposed project is too small (120,000 yds3) and too far away to influence the dynamics of the Inlet, which has millions of cubic yards of sand contained in its shoals."

Corps Evaluation: The Corps is satisfied with the applicant's response.

Several commenters expressed concerns regarding the potential breach of the borrow area located south of the proposed project and the potential for the spit to be bisected.

Applicant's Response: "In their recent comments, SELC has raised the concern that the proposed new groin could contribute to a breach of the existing island at the former borrow area. This concern is misplaced. As discussed above, the applicant has demonstrated that the proposed project will greatly increase the quantity of sand on the beach south of the existing groin and will also provide more sand to the beach south of the proposed groin. For this reason alone, the proposed project is not likely to increase the potential for a breach in the island. Speculation that the groin could cause a breach is unsupported by the science, as explained in the Dr. Kana's supplemental comments.
Dr. Kana has opined: "The proposed project will not cause a breach of Sea Island. To the contrary, the project will inject a large volume of sand into the sand-sharing system including the southern end of the island. … The resulting bypassing sand will reduce the underlying (i.e. historical) erosion rate for the area and, therefore, reduce the threat of a breach in the vicinity of nourishment."

The low-lying area south of The Reserve development, including the borrow area, has long been vulnerable to normal shoreline erosion processes. The frontal dune along the borrow area was breached in 2015 prior to issuance of Shore Protection Committee Permit #438 and prior to Hurricane Matthew and Hurricane Irma, which caused further erosion and overwash to the area. At the present time, the former borrow area, which was tidal marsh as recently as 2016, is now completely covered with sand, with some overwashed sand being deposited on the Black Banks River side of the feature.

Dr. Kana notes: "The spit south of the proposed project is subject to changes in Gould's Inlet and has experienced highly variable rates of change since the mid-1980s...These variable changes do not correlate with the timing of nourishment and construction of the south groin in 1991. Instead, the stability of the south spit is highly influenced by natural changes in Gould's Inlet or...shoreline changes....The spit was eroding before any groins were built as documented by Griffin and Henry (1984) and others. Likewise, there is no evidence to support the theory that the proposed groin would increase the likelihood of a breach...Given the amount of time that the existing groin has been in place, over 25 years, without precipitating a breach near the structure, the proposed groin (with concomitant nourishment) will not likely cause a breach of Sea Island. The amount of sand that will be added to the sand-sharing system includes advance nourishment to allow bypassing and a return of sand to the downdrift beach. This project will immediately provide a net gain of sand to the downdrift beach.

The commenter notes overwash in the former borrow area south of The Reserve. Overwash occurs naturally when storm-induced waves exceed the height of the existing dunes, causing sand to be deposited inland of the beach and dune system. The south end of Sea Island, south of The Reserve, is historically lower and more dynamic in erosion and accretion patterns than the remainder of the island due to the natural oscillation of the Gould's Inlet ebb tidal delta. The variability of the Gould's Inlet delta is beyond the control of the applicant, and the proposed groin is too small to have a measurable effect on the naturally-occurring processes occurring downdrift of the proposed project. The project will introduce more sand bypassing around the proposed groin, but, despite this additional sand, overwash may continue to occur. The project reduces the likelihood of a breakthrough at the location of the former borrow area. However, relocation of tidal inlets is a natural process that occurs from time to time in similarly situated barrier islands."
Corps Evaluation: The Corps is satisfied with the applicant's response. As stated above the erosion occurring along the Sea Island shoreline is the result of a combination of multiple processes and factors. Specifically, the Sea Island shoreline, including the Spit, is currently sand starved and eroding as a result of a combination of natural processes (i.e. sea level rise, wind, waves, etc.), the past hard armoring of the shoreline (i.e. existing sea walls, revetments and groins) and insufficient inputs of sand into the Sea Island beach system.

As stated above, Mr. Conner's review concluded that the existing T-head groins are currently trapping some of the material (sand, silt, clay, etc.) that is naturally coming from the north, and moving south. The southern end of the spit is currently eroding and would continue to erode as long as the existing groin system remains in place. Therefore, regardless of whether the new proposed groin is constructed, the existing hard armoring (which has been in place to some extent since the 1980's) would continue to contribute to the erosion of the spit.

Furthermore, the area between the southern groin and proposed new groin represents only an 8 percent increase, when compared to the area currently between the northern and southern groins. According to Mr. Conner, it is unlikely that the construction of a new shorter groin just south of the existing southern groin will interrupt sediment transport in any measurable way under the current system.

In addition, any draft permit issued for the proposed project would include requirements to monitor sand movement within the southern groin and proposed new groin as well as downstream of the groins. This monitoring would be accomplished through extensive surveying of the shoreline in these areas both pre and post construction. Should the monitoring/surveying indicate that the new groin is trapping sand, the applicant would be required to submit a corrective action plan (i.e. sand bypass, adjustment/removal of the new groin, etc.). For specific monitoring requirements, refer to section 11.

Two Commenters expressed concern regarding authorizing a project to facilitate construction in an area not eligible for Federal flood insurance and its effects on the overall cost of the property insurance rates in the area.

Applicant's Response: "The area of the Reserve at Sea Island was included in the Coastal Barrier Resources Act System because it was designated in 1990 as an undeveloped coastal barrier; this designation was based solely on the land's geology and relative development, not on its suitability for future development. CRBA does not restrict or prevent private development of coastal barriers and does not include any regulations regarding private development of coastal barriers. The Coastal Barrier Resource Act (CBRA) was enacted to prevent federal expenditures and assistance in areas deemed to be at high risk from natural forces, such as hurricanes, so as not to encourage development at potential federal expense. The applicant is fully aware that the subject property is not eligible for federal or state assistance. Therefore, any damage to the development will be borne privately—there will be no taxpayer funds used for construction, insurance or reconstruction in the case of damage."

Corps Evaluation: The Corps is satisfied with the applicant's response.

Several commenters expressed concern about the lack of alternatives considered in the original application. In addition, several commenters stated that SIA has not demonstrated the project complies with the Clean Water Act Section 404(b)(1) Guidelines and thus the proposed project should not be permitted.

Applicant's Response: "The applicant discussed reasonable and viable alternatives at Section 5 of the application, including alternatives located both outside and within SPA jurisdiction. By selecting the preferred alternative, and

pre-filling the cell created by the proposed groin, natural sand bypass will occur almost immediately back to the natural beach. The preferred alternative provides for protection to the uplands while creating suitable nesting habitat for sea turtles. In addition, beach renourishment without a groin does not work, at least not without repeated maintenance, as demonstrated generally and on Sea Island in particular. Dr. Oertel's response to comments explains that in 1986 over 100,000 cu yards was dredged from the Black Bank River pursuant to CMPC and Corps permits and placed on the beach pursuant to permits from the Shore Assistance Committee of DNR and the Corps and a Mineral Lease from the State of GA. The original permit was to dredge 144,000 cu yards, place 100,000 on the beach and stockpile the rest for future use. In 1987, just a year later, the permit was amended on an emergency basis to allow dredging of an additional 48,000 cu yards for a total of 192,000. Severe storms had washed away the material previously placed on the beach. The beach renourishment without terminal groins was not successful, and in 1989 Robert G. Dean and George Oertel submitted a recommendation for a beach renourishment project with two terminal groins. David Basco, P.E., PhD., calculated that the half-life of a nourishment project at this site without the terminal groin would be 2-3 months."

Corps Evaluation: On October 15, 2015, Sea Island Acquisitions submitted a Department of the Army (DA) application requesting authorization to construct a T-head groin and create a dune ridge and 150' wide beach by discharging sand between the proposed groin and the existing southern groin. The sand would be excavated from the existing catchment basins located adjacent to the northern and southern groins. On December 18, 2015, the Corps published a PN advertising the above project.

On March 6, 2018, the applicant amended the above application. Specifically, the amended application included the construction of the T-head groin as well as beach renourishment activities along 17,000 linear feet of the Sea Island shoreline (i.e. from the existing northern groin to the proposed T-head groin). In addition, all sand utilized for the project would be hydraulically dredged from an offshore borrow site an pumped onto the Sea Island beach including the area between the proposed groin and existing southern groin. The amended application also included an updated alternative analysis. Please refer to Section 5 for the Corps 404(b)(1) alternative analysis.

Two commenters stated that the applicant should consider the following alternatives: (1) Nourish from the existing southern groin to the proximal end of the spit and (2) Remove the existing southern groin and nourish the beach to the terminus of the Spit. One commenter expressed concerns regarding the Applicant's interpretation of the conservation easement that has been placed on the southern portion of the Island (i.e. downdrift of the proposed groin). Specifically, the commenter believes that the conservation easement should not

preclude the Applicant from nourishing the beach downdrift of the proposed groin.

Applicant's Response: "The new groin proposed by Sea Island as part of this project is essential to hold the nourishment sand in place so that it can serve the purpose of storm protection. Without the groin, the nourishment material would quickly wash away. At the hearing on the Shore Protection Committee permit, Dr. Basco testified that the half-life of a nourishment project from the existing south groin to the end of the island would be only 1 to 3 months…The Supplemental Report of Bret M. Webb, attached to the SELC comment letter dated June 28, 2018, acknowledges that even if the beach nourishment project south of the south groin were extended in length from 1,200 feet to almost a mile, the half-life of the nourishment sand would be increased only to "over 1.35 years."

This is obviously not a practicable alternative, as Dr. Basco has concluded… Dr. Kana expressed the same conclusion: "a project with such a short half-life is clearly not a practicable alternative when considering that the proposal would be outside the scope of the overall project purpose, which is to provide storm protection to the developed Sea Island shoreline, and given the great expense and logistical requirements for subsequent nourishments."

A beach nourishment project of this short a duration would be prohibitively expensive, particularly given the tremendous costs required to mobilize and demobilize the dredge, pipes and other heavy equipment involved. In this instance Sea Island was fortunate to locate a nearby, readily available source of sand within State waters; finding suitable material for repeated future nourishment projects is by no means assured. Moreover, regulatory requirements add to the expense and uncertainty inherent in future nourishment projects.

Further, as to the suggestion that Sea Island undertake a beach nourishment project from the existing south groin to the south end of the island without the benefit of the proposed new groin, this option would be barred by the existing Conservation Easement that applies from the southern boundary of The Reserve development to the south end of the island. Under the terms of the Conservation Easement, Sea Island is prohibited from conducting a beach nourishment project in this area.

In order to preserve the natural and scenic benefits of the undeveloped south end, and to render it off-limits for any future development, Sea Island conveyed to the St. Simons Land Trust a Conservation Easement that limits its use of the south end. The Conservation Easement is broadly worded to assure that the land will be "retained forever predominantly in its natural and scenic condition for conservation purposes." Any residential, commercial, or industrial use is

prohibited, as is any change or alteration of the natural, open space, or scenic features of the property. The Conservation Easement includes a long list of specific activities that are prohibited. As particularly relevant to SELC's proposed alternative, the Conservation Easement prohibits: the use of motorized vehicles, except for emergency access and in connection with turtle patrols and other scientific studies; the placing or filling of soil on the property; the construction of any roads; and any change, disturbance, alteration, or impairment of the natural, open space, or scenic features of the property.

A shoreline engineering activity is allowed at the northern edge of the Conservation Easement tract, but *only* if it is confined to the area within 160 feet of the southern boundary of The Reserve, which is the area where the proposed groin of the proposed project will be located. As a result, any activity to construct or maintain a beach nourishment project south of that location would be prohibited by the Conservation Easement.

The limitations and restrictions of the Conservation Easement extend not only to the high water line on the beach but also to the low water line "to the extent of [the Company's] right, title and interest in and to the land lying between the high water line and the low water line." As owner of the adjacent upland, Sea Island has some rights below the high water line. *See State v. Ashmore*, 235 Ga. 136 (1976). In short, the Conservation Easement imposes severe limitations on any activity anywhere on the covered tract (including the vast majority of the south end of the island), including down to the low water line.

Nevertheless, SELC has maintained that it might be possible to undertake a beach nourishment project along the full length of the south end without violating the Conservation Easement. This suggestion is unfounded. Nourishment material placed below the high tide line without dunes and without the benefit of a groin to slow the dispersion of the material would likely be unpredictable and short lived. Also, adding additional quantities of sand into the Gould's Inlet area could have unintended consequences. The Supplemental Comments of Dr. Basco address the alternatives proposed by SELC and the Supplemental Report of Dr. Webb.1

SELC's first suggested alternative is placement of a nearshore berm with the hope that the material in the berm would move onshore. As explained in Dr. Basco's Supplemental Comments, the construction of nearshore berms with the expectation that the material will wash onto the beach is very much in the experimental stage. In Dr. Basco's expert opinion, the scientific evidence is not sufficient to support a conclusion that a feeder berm placed in nearshore waters will move landward in sufficient quantity to become a subaerial beach nourishment design adequate for storm damage mitigation. As a result, this alternative is not practicable, and Dr. Webb appears to have abandoned this alternative, as it is not discussed in his most recent comments.

Despite the obvious restrictions imposed by the Conservation Easement, SELC asserts that beach nourishment below mean high water should be considered and would be feasible. Even assuming (incorrectly) that the restrictions of the Conservation Easement might not extend to the low water line, beach nourishment along the beach up to the high water mark is not a viable or practicable alternative to use of the terminal groin specified by the Project design. As Dr. Basco points out, it is not practicable to place beach nourishment on the beach up to the high water mark without equipment, including vehicles, on the beach above the high water mark, as that would limit the ability to spread and shape the sand. Moreover, Dr. Webb's suggestion that all equipment could move out of the Conservation Easement area and back to the Project area before every high tide would severely limit the working hours for the project and significantly add to the cost.

Another alternative suggested by Dr. Webb is placement of beach nourishment material in the swash zone below the low water mark. The Supplemental Comments of Dr. Basco explain multiple reasons why beach nourishment south of the Project site below mean low water is not a practicable alternative to the terminal groin. Construction of the proposed beach berm at the Project site but without a groin, and placement of beach nourishment material below mean low water to the south, would create a vertical elevation differential of over 10 feet between the nourished Project beach berm (at elevation +6 ft NAVD88) and the downdrift beach nourished only up to mean low water (at elevation -4 ft NAVD88 and below). As a result of that vertical differential "the sand from the Permitted Project would very quickly move downward, laterally, and seaward." This, in turn, "would cause the Permitted Project beach nourishment volume to quickly disappear and diminish the storm damage mitigation benefits of the project." As a result, a beach berm below mean low water would not accomplish the project purposes of erosion control and protection of The Reserve development from storms and high tides.

At the administrative hearing on the Shore Protection Committee permit, the ALJ heard testimony concerning SELC's argument that there are reasonable and viable alternatives to the groin. The ALJ concluded that "the evidence at the hearing was insufficient to support a finding that a beach nourishment project without a groin is a reasonable or viable alternative to the permitted project." Recent submittals by SELC continue to fail to demonstrate a practicable, reasonable, or viable alternative to the proposed groin."

Regarding removal of the southern groin, the applicant states "The position and length of the existing south groin dictate the beach width on the updrift side. As can be seen in aerial photography, erosion on Sea Island is greatest in the middle of the developed shoreline, caused by the focused waves emanating from the Hampton River Inlet and Gould's Inlet into the embayment between Hampton River Inlet and Gould's Inlet. In order to maintain a functional beach width at the

center of the island, the groins were designed at a length sufficient to hold the minimal amount of sand in the groin fillets (the widest beach width), and the beach tapers to its narrowest point at the center of the island. If the south groin was removed, there would be an immediate and sustained loss of beach width at the center of the island. This would greatly shorten the useful life of the beach nourishment project and would compromise its success, which contemplates periodic backpassing of sand from the fillet of the south groin back to the center of the beach. The only way to offset this effect would be to conduct larger and more frequent nourishment projects, which would be contrary to the Section 404(b)(1) Guidelines when considering cost and logistics in determining the LEDPA. Further, the rapid and sustained loss of dry sand beach at the center of the island, which is indicative of the existing conditions, would result in a loss of a substantial amount of sea turtle nesting habitat.

The groins were constructed with Campbell units as they were thought at the time to be more moveable than a standard rock groin structure. It has since been determined that due to their large size, they in fact require much larger equipment to move, require more time and effort to move, and result in far more disturbance to modify their position than standard rock groins. With almost 30 years of exposure to the elements, the Campbell units have weathered and might be compromised if moved. At any rate, removal would be very costly.

Dr. Basco notes that experts opined in the 1980s that sediment on Sea Island moves both north and south; we now have 60-70 years of physical evidence that sand naturally moves away from the middle of Sea Island producing a large gradient in sediment transport rates. As a result, Dr. Basco explains, Dr. Webb's opinion that the project half-life of a beach nourishment project from the north groin to the end of the island, if the south groin were removed, would be 24.25 years is not correct. "This estimate of a project half-life is totally incorrect because it assumes a constant longshore diffusitvity coefficient (related to the breaking wave height and resulting sediment transport rate) over the entire project length when clearly, the physical evidence shows otherwise. The physical evidence shows that over 27 years, the middle-section needed sand re-nourishment 8 times or about every 3.5 years." Dr. Basco concludes that "removal of the South-end groin would force unreasonable and impracticable measures for management of the beach."

Dr. Kana also disputes Dr. Webb's calculation of a half-life of 24.25 years for a nourishment project from the north groin to the south tip of the island, with no south groin in place. Dr. Kana has explained the meaning of project half-life and set forth a rough calculation of a 6.25 year-long approximate half-life. "However, this assumes a post-nourishment erosion rate approximately matching the long-term historical erosion rate. In actuality, nourishment project tend to erode at a faster rate because of the unnatural bulge in the shoreline created by the added sand. This higher rate has the effect of reducing the half-life further." Moreover,

according to Dr. Kana, the absence of the existing and proposed groins "would certainly accelerate the overall erosion and prevent the mitigating benefits of recycling which further impact the project half-life. Importantly, the absence of a fillet to allow for recycling would result in an inability to address erosion hotspots, thus decreasing the project's effectiveness in serving the project purpose."

Corps Evaluation: The Corps has completed the alternative analysis for the proposed project. Please refer to Section 5 below.

One commenter expressed concerns regarding the potential impacts that sea level rise has on coastal environments and how those impacts have occurred and would continue to occur on Sea Island. To document this, the commenter reviewed aerial imagery and concluded that in the 1988 aerial imagery (prior to the construction of the south groin) the beach along Sea Island appeared to be intact and contained a high tide dry beach along Reach 1 ranging from 130-175 feet. According to the commenter, aerial imagery also indicated that since construction of the southern groin, the dry sand beach has been reduced to 10-40 feet and that "the substantial reduction in the beach width below the south jetty did not begin in earnest until after the south jetty was constructed. The commenter also stated that Reach 1 is "substantial distinct from the other Reaches…Therefore, the analysis for Reach 1 of what is the Least Environmentally Damaging Practicable Alternative should not be considered in the same context as for the Reaches north of the existing south jetty."

Applicant's Response: "Burnside's comments focus on The Reserve (also referred to as Reach 1)…As for the discussion of future sea level rise, storm frequency, and storm intensity, the authors cited by Burnside vary in the particulars, but all projections support the applicant's need and right to protect upland property and infrastructure. The Reach 1 project is a vital component of the larger overall project, and, at the direction of the Corps, the Reach 1 Reserve project and the larger beach nourishment project were combined into one application to be reviewed as a comprehensive beach management plan for the entire island. Notably, the costs of construction and maintenance of the project, as well as the risk of damage from storms and tides, are born by the private property owners, not by the public.

With respect to long-term project viability, the applicant notes that with the large infusion of sand with the beach nourishment project, there will be ample sand within the groin system to keep The Reserve segment adequately filled. Sea Island was able to maintain a functional shoreline for over 25 years from the initial nourishment in 1990 by utilizing an authorized sand recycling program to address erosional hotspots that developed along the project shoreline. It took two hurricanes occurring only a year apart to cause the loss of sand within the project limits to an extent that led to the submittal of the amended project currently under

review. The project is financed entirely by private funding, and future management and maintenance will be the sole responsibility of the applicant; no local, state, or federal funds, or insurance, will be expended to construct or maintain the project."

Corps Evaluation: The Corps is satisfied with the applicant's response.

One commenter stated that the project would significantly degrade waters of the United States.

Applicant's Response: "Under 40 C.F.R. § 230.10(c), no discharge of dredged or fill material may be permitted that would result in the "significant degradation of the waters of the United States," except as provided under Section 404(b)(2) of the Clean Water Act.

The proposed project will provide necessary storm protection to upland property in a manner that minimizes adverse effects by restoring beach and dune habitats while minimizing effects at other shoreline locations. The placement of beach quality sediments into the sand-sharing system will augment the 1990 nourishment project and will contribute sand not only to the project beach, but also to downdrift locations through the bypassing of the existing and proposed groins. The proposed project will result in the restoration of sea turtle habitat along a major portion of the developed shoreline. Other concerns relating to sea turtle and shorebird habitat are addressed in the prior section. Concerns expressed by some commenters as to the potential loss of recreational areas are likewise misplaced. The proposed project also will not prevent recreational public use, subject to property ownership rights and state boating regulations. The addition of (at a minimum) 1.3 million cy of beach quality sediments in the project area will significantly enhance sea turtle and shorebird habitat as well as recreational areas along the Sea Island beachfront. Measures to further minimize the effects of the project have also been incorporated into the project design."

Corps Evaluation: The Corps is satisfied with the applicant's response. Please refer to Section 12.3.

One commenter stated that the Corps should deny SIA's application because the proposed project purpose is too narrow.

Applicant's Response: "The majority of the Sea Island shoreline is protected by existing shoreline protection projects, which consist of rock revetments and sloping concrete seawalls, together with the north and south groins and the beach nourishment deposited between the two groins in the 1990s. However, due to recent hurricanes, this shoreline protection system is in need of restoration and an infusion of beach nourishment material. In addition, there is an area south of the existing south groin (The Reserve), which has had no

revetment or other protection and has continued to erode since the initial nourishment project in 1990. The project seeks to install a tapered groin, constructed dune, and beach nourishment to provide storm protection for this section of the island.

Contrary to some of the comments, the project purpose is not residential development. The applicant is not seeking a § 404 permit to develop The Reserve. Indeed, the company has already completed infrastructure development of the upland property at The Reserve— construction of roads and bridges, installation of utilities—without the need for any permit from the Corps. Although no dwellings have yet been constructed at The Reserve, the subdivision has been approved by Glynn County and the lots are available for sale. The applicant has expended significant resources to obtain relevant zoning approvals and construction permits for access roads and utilities to service the upland development, all of which have been constructed. Construction of the homes on the upland will be above and outside of any Corps jurisdiction and will not require any Corps permits."

Corps Evaluation: The applicant's stated purpose and need is "to restore the Sea Island (GA) beach to provide storm protection for adjacent uplands, restore wildlife habitat, restore recreational functions, and to provide a reservoir for sand recycling to address existing erosion patterns." Based on this purpose and need, the Corps has determined that the basic project purpose is storm protection and that the overall project purpose is to protect upland lots and development located along the shoreline of Sea Island from storm damage.

One commenter stated that the National Environmental Policy Act (NEPA) requires the Corps to prepare an Environmental Impact Statement (EIS). The commenter also stated that an EIS is necessary to determine the extent of the direct, indirect and cumulative impacts to the Spit and Federally threatened and endangered species and that "the effect of the project on the coastal ecosystem should not be discounted as insignificant."

Applicant's Response: The National Environmental Policy Act (NEPA) establishes procedures that a federal agency must follow when analyzing the effects of proposed federal actions. An agency initially must determine whether the proposed action constitutes a "major Federal action" defined as an action "significantly affecting the quality of the human environment." 42 U.S.C. § 4332(C); 40 C.F.R. § 1508.18; *Sierra Club v. Van Antwerp*, 526 F.3d 1353, 1363 (11th Cir. 2008). In making this determination, agencies often prepare an Environmental Assessment or "EA". *See Sierra Club v. U.S. Army Corps of Eng'rs*, 295 F.3d 1209, 1215 (11th Cir. 2002); *see also* 33 C.F.R. § (Corps regulation on Environmental Assessments). If the agency finds that the proposed action will have "significant" environmental impacts, NEPA instructs agencies to prepare an Environmental Impact Statement (EIS). 42 U.S.C. §

4332(2)(C). If, however, the agency prepares an EA and concludes that the proposed action is not likely to have significant impacts, the agency may issue a Finding of No Significant Impact (FONSI), thus completing the NEPA process. 40 C.F.R. § 1508.13; 33 C.F.R. § 230.11.

In determining whether a proposed action will likely have a significant effect on the human environment, federal agencies must consider, among other factors, the following: (1) "Unique characteristics of the geographic area such as proximity to. . . ecologically critical areas"; (2) "The degree to which the effects on the quality of the human environment are likely to be highly controversial"; (3) "The degree to which the possible effects on the human environment are highly uncertain"; (4)"Whether the action is related to other actions with individually insignificant but cumulatively significant impacts"; and (5) "The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973."

40 C.F.R. § 1508.27(b). A federal agency's determinations of these factors, which implicate agency expertise, are entitled to substantial deference. *Marsh v. Or. Nat. Res. Council*, 490 U.S. 360, 376 (1989).

As applied here, because the record demonstrates that the proposed project is not likely to have a significant effect on the human environment, the Corps is not required to conduct an EIS. Indeed, most of the comments submitted to date opposing the project complain about existing conditions, whether the result of natural causes or past federal permitting decisions. It is important to recognize, however, that Congress enacted NEPA "to require agencies to assess the future effects of future actions"; NEPA "is not directed at the effects of past accidents and does not create a remedial scheme for past federal actions." *Metro. Edison Co. v. People Against Nuclear Energy*, 460 U.S. 766, 779 (1983).

Properly considered, none of the issues and allegations raised by the commenters necessitate that an EIS be performed for the project proposed here."

Corps Evaluation: NEPA requires that the preparation of an EIS occur when a major Federal action is determined to significantly affect the quality of the human environment. Based on the information provided, the Corps has determined that the proposed project would not have a significant effect on the quality of the human environment. In addition, the Corps has determined that the proposed project would not have an adverse effect to threatened or endangered species or adversely modify listed critical habitat.

Regarding cumulative impacts, based on the cumulative impact analysis performed in Section 9 of this document, the Corps has determined that the

proposed project would have a minimal individual and cumulative adverse effect on the aquatic environment, including the coastal ecosystem and threatened and endangered species. Given the above, the Corps has determined that the proposed project would not result in a significant adverse effect and thus preparation of an EIS is not required.

One commenter stated that the proposed project should not be permitted because it does not comply with 33 C.F.R. 320.4(a) public interest considerations.

Corps Evaluation: The Corps has evaluated the probable impact the proposed project may have on the public interest in Section 7.1 of this document. Based on that evaluation, the Corps has determined that the project is not contrary to the public interest and therefore complies with 33 CFR 320.4(a).

4.2 Were additional issues raised by the Corps including any as a result of coordination with other Corps offices? Yes

If yes, provide discussion including coordination of concerns with the applicant, applicant's response and Corps' evaluation of the response:

By letter dated March 24, 2016, the Corps requested the applicant respond to comments received during the October 2015 JPN as well as provide the following information: (1) an updated alternatives analysis; (2) an updated biological assessment; (3) a cumulative impact analysis; and (4) an evaluation of the effects the proposed project may have on public interest factors.

On January 5, 2017, and March 6, 2018, the applicant provided the above information. The updated alternative analysis is discussed in Section 5 below. Evaluation of the updated biological assessment and potential affects to wildlife, including threatened and endangered species, is discussed in Section 4 above as well as in Sections 6, 7, 9 and 10 below.

Regarding cumulative impacts, based on the cumulative impact analysis performed in Section 9 of this document, the Corps has determined that the proposed project would have a minimal individual and cumulative adverse effect on the aquatic environment, including the coastal ecosystem and threatened and endangered species.

The Corps has also evaluated the probable impact the proposed project may have on the public interest in Section 7.1 of this document. Based on that evaluation, the Corps has determined that the project is not contrary to the public interest and therefore complies with 33 CFR 320.4(a).

4.3 Were comments raised that do not require further discussion because they address activities and/or effects outside of the Corps' purview? No

5.0 Alternatives Analysis (33 CFR Part 325 Appendix B(7), 40 CFR 230.5(c) and 40 CFR 1502.14). An evaluation of alternatives is required under NEPA for all jurisdictional activities. An evaluation of alternatives is required under the Section 404(b) (1) Guidelines for projects that include the discharge of dredged or fill material. NEPA requires discussion of a reasonable range of alternatives, including the no action alternative, and the effects of those alternatives; under the Guidelines, practicability of alternatives is taken into consideration and no alternative may be permitted if there is a less environmentally damaging practicable alternative.

5.1 Site selection/screening criteria: In order to be practicable, an alternative must be available, achieve the overall project purpose (as defined by the Corps), and be feasible when considering cost, logistics and existing technology.

Criteria for evaluating alternatives as evaluated and determined by the Corps: The Corps has determined that the criteria for evaluating practicable alternatives are costs, logistics, existing technology, and those that achieve the overall project purpose.

5.2 Description of alternatives

5.2.1 No action alternative:

No action alternative 1: Bulkhead installation in the upland

This alternative would consist of the construction of a vertical seawall landward of the Corps' jurisdiction (i.e. in the upland). This alternative would result in no direct effects to the aquatic environment. This alternative would achieve the overall project purpose and could be completed considering costs, logistics, and existing technology. Therefore this alternative is considered a practicable alternative. However, indirectly, this alternative would result in the continued erosion of a portion of the existing storm protection (i.e. dunes) as well as result in adverse effects to sea turtles through erosion of nesting habitat.

No action alternative 2: Do nothing.

This alternative consists of allowing the current condition of the shoreline to remain as is. Specifically, there would be no new revetments/sea walls or beach renourishment projects constructed as well as no maintenance to the existing

storm protection projects (i.e. existing revetments/sea walls, dunes, etc.). This alternative would result in no direct effects to the aquatic environment. However, indirectly, this alternative would result in the continued erosion of a portion of the existing storm protection (i.e. dunes) as well as result in adverse effects to sea turtles through erosion of nesting habitat. Therefore, this alternative would have an adverse effect to threatened and endangered species.

5.2.2 Off-site alternatives: The Corps has determined that the project would not result in the discharge of dredged or fill material into a special aquatic site. Therefore, an offsite alternative analysis was not performed.

5.2.3 On-site alternatives

On-site alternative 1 (applicant's preferred alternative): Construction of a T-head groin with Beach Renourishment. This alternative would achieve the overall project purpose and could be completed considering costs, logistics, and existing technology. Therefore this alternative is considered a practicable alternative.

On-site Alternative 2: Nearshore berm

Nearshore berms can potentially function as a source of sand for eroding beaches and provide a limited measure of storm protection to oceanfront property through wave energy attenuation. Berm construction usually entails the placement of material in shallow water just off the beach to create a nearshore sand feature that functions in the same manner as a natural sandbar. The construction of such a berm along Sea Island could be completed using compatible sand from the proposed offshore borrow site. Dredging technology allows for berm construction in water depths as shallow as 15 feet, and the dissipation of waves as they pass over the berm during normal water levels may provide some mitigation of background shoreline erosion. However, during storm events when water levels are elevated; storm waves would pass over the berm, erode the beach, and present a threat to upland property. In addition, although some sand may be transferred from the berm to the beach, the volumetric extent of transfer would be insufficient to maintain a functional recreational beach and adequate shoreline protection. For these reasons, this alternative does not meet the overall purpose of shoreline protection and is therefore not a practicable alternative.

On-site alternative 3: Shoreline armoring (rock revetments and sea walls) without nourishment.

This alternative consists of armoring the shoreline with either a rock revetment, sea wall or combination of both. This alternative would achieve the overall project purpose of storm protection and could be completed considering costs, logistics, and existing technology. Therefore this alternative is considered a practicable alternative.

On-site alternative 4: Relocation of the Existing Southern Groin to the Proposed Reserve Groin Location and Renourishment of the Shoreline.

This alternative would consist of relocating the existing southern groin 1,200' south to the location of the proposed new groin and renourishing the shoreline between the existing northern groin and new groin. This alternative would achieve the overall project purpose of storm protection and could be completed considering costs, logistics, and existing technology. Therefore this alternative is considered a practicable alternative.

On-site alternative 5: Removal of the Southern Groin and Beach Nourishment from the Northern Groin to the Spit

This alternative would consist of removing the southern groin and renourishing the beach to the location of the spit.

The position and length of the existing south groin dictate the beach width on the updrift side. As can be seen in aerial photography, erosion on Sea Island is greatest in the middle of the developed shoreline, caused by the focused waves emanating from the Hampton River Inlet and Gould's Inlet into the embayment between Hampton River Inlet and Gould's Inlet. In order to maintain a functional beach width at the center of the island, the groins were designed at a length sufficient to hold the minimal amount of sand in the groin fillets (the widest beach width), and the beach tapers to its narrowest point at the center of the island. If the southern groin was removed, there would be an immediate and sustained loss of beach width at the center of the island. This would greatly shorten the useful life of the beach nourishment project and would compromise its success, which contemplates periodic sand recycling from southern groin fillet back to the center of the beach. The only way to offset this effect would be to conduct larger and more frequent nourishment projects. Further, the rapid and sustained loss of dry sand beach at the center of the island, which is indicative of the existing conditions, would result in a loss of a substantial amount of sea turtle nesting habitat.

Therefore, it is likely that without the southern groin any sand placed along the shoreline (including the construction of dunes) would disseminate down drift quickly and therefore result in only temporary shoreline storm protection.

Long-term, this alternative would result in the erosion of a portion of the existing storm protection (i.e. dunes) as well as result in adverse effects to sea turtles through erosion of nesting habitat. This alternative would also remove a fillet in which the applicant uses to perform sand recycling. Without sand recycling, erosional hotspots could not be mitigated for. Given the above, this alternative would not meet the overall project purpose of storm protection and is therefore not a practicable alternative.

On-site alternative 6: Nourish from the existing southern groin to the proximal end of the spit.

This alternative would consist of renourishing the beach from the existing southern groin to end of the spit. This alternative is outside the scope of the project and would not meet the overall project purpose. The overall purpose of the project is to protect upland lots and development located along the shoreline of Sea Island from storm damage. Currently there is no development nor potential for development in the upland property that is bounded by the existing conservation easement. As a result, this alternative would not achieve the overall project purpose and is therefore not a practicable alternative.

5.3 Evaluate alternatives and whether or not each is practicable under the Guidelines or reasonable under NEPA

As stated above, the Corps has determined that no action alternatives 1 and on-site alternatives 1, 3, and 4 are practicable alternatives.

5.4 Least environmentally damaging practicable alternative under the 404(b)(1) Guidelines (if applicable) and the environmentally preferable alternative under NEPA:

No action alternative 1: This alternative would consist of the construction of a vertical seawall landward of the Corps' jurisdiction (i.e. in the upland). This alternative would result in no direct effects to the aquatic environment. However, indirectly, this alternative would result in the continued erosion of a portion of the existing storm protection (i.e. dunes) as well as result in adverse effects to sea turtles through erosion of nesting habitat. Therefore, although the alternative is practicable, it is likely that it would result in the eventual loss of approximately 3 miles of existing sea turtle nesting habitat. As a result, this alternative is not considered the least environmentally damaging practicable alternative.

On-site alternative 3: This alternative consists of armoring the shoreline with either a rock revetment, sea wall or combination of both. As stated in the Corps' Coastal Engineering Manual (CEM), "coastal armoring is designed to protect the upland, but does not prevent erosion of the beach profile…Thus an eroding beach will continue to erode. If the armoring had not been placed, the width of the beach would have remained relatively the same, but with increasing time, would have been located progressively landward."

The absence of a high tide beach reduces the amount of sediment along the shoreline and subsequently the amount of sediment available to be redistributed by waves and the longshore drift (i.e. moved downdrift to the spit). In addition, hardened structures do not absorb energy from incoming waves. Instead, these structures tend to refract (or displace) the energy onto the adjacent shorelines and as a result erosion often occurs downdrift and/or up drift of the structures.

Shoreline armoring has been implemented along the Sea Island shoreline between 1979 and the early 1980s. According to the applicant, during Hurricanes Matthew and Irma, exposed portions of the existing revetment (i.e. areas where there is no high tide beach and/or dune system) sustained damage; however the portions of the existing revetment protected by beach and dunes did not.

In addition, shoreline armoring without nourishment also leads to the eventual elimination of nesting habitat for sea turtles. Once the beach erodes and retreats back to the revetment, the sand source for littoral transport is eliminated by the rocks, leading to the long-term elimination of nesting habitat. This condition was present on Sea Island prior to the applicant conducting the previous nourishment projects in the early 1990's (Figure 6). Turtles cannot access areas behind the rocks even if suitable nesting habitat were available in those areas, but on Sea Island no such condition currently exists as all areas landward of the revetments have been developed.

Therefore, although the alternative is practicable, it is likely that it would result in the loss of approximately 3 miles of existing sea turtle nesting habitat. As a result, this alternative is not considered the least environmentally damaging practicable alternative.

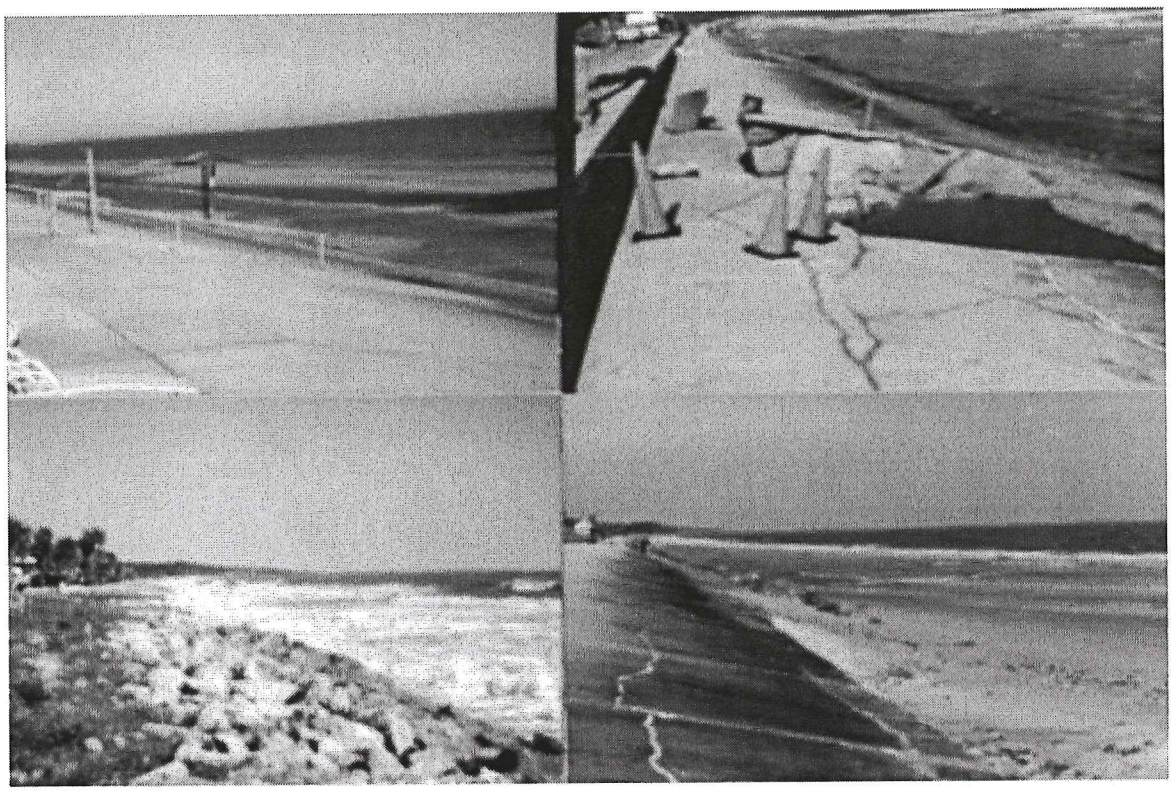

Figure 6. Pre-nourishment conditions on Sea Island.

On-site alternative 4: This alternative would consist of relocating the existing southern groin 1,200' south to the location of the proposed new groin and renourishing the shoreline between the existing northern groin and new groin. The existing southern groin is considered a terminal groin. Terminal groins produce a "transition" region where pre-groin, coastal sediment transport processes in the alongshore (both directions) and the on-off shore directions are felt by the presence of the terminal structure. Where one alongshore direction dominates, e.g. South direction as at the south-end of Sea Island, the transition region is south of the existing, southern groin.

Sand moves around the seaward end, over the top, through the joints, and past the landward end of terminal groins. To mitigate shoreline changes in the transition region of terminal groins, the Corps', Coastal Engineering Manual (2006, Part V, Section 3, Figure V-3-32) recommends installing tapered (shorter length) groins on the down-drift side of terminal groins as shown in Figure 7 below. The proposed project, which incorporates the two-groin design, creates a tapered groin system extending from the existing southern groin.
The tapered groin in the transition region allows nourished sand in the shorter groin fillet to immediately begin to migrate around the shorter end, to more

quickly reach the down drift beach. The proposed design follows the recommendations found in the Corps of Engineers, Coastal Engineering Manual (2006), which suggests groins are acceptable when constructed in conjunction with nourishment: *"Modern coastal engineering practice is to combine groin construction with beach nourishment to permit sand to immediately begin to bypass the groin field."*

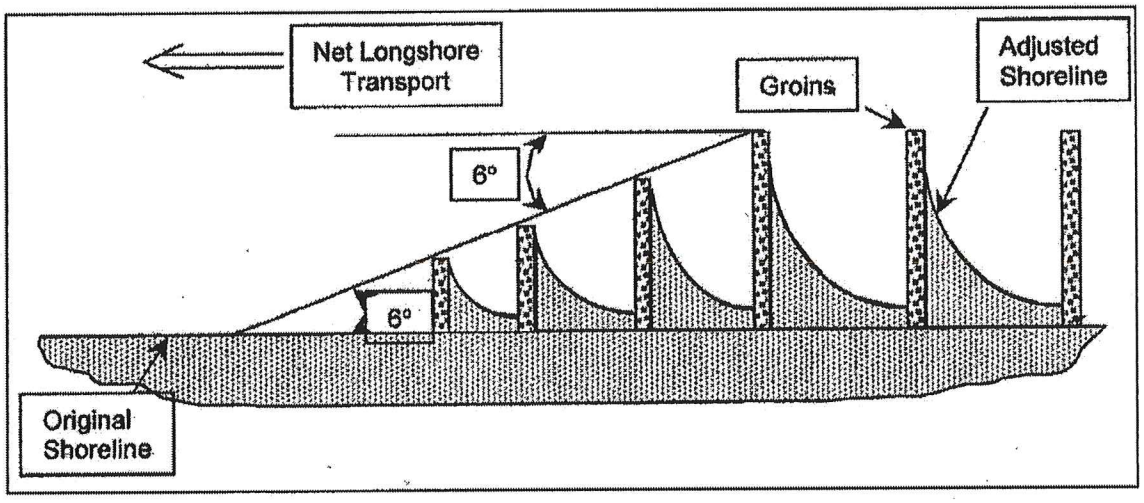

Figure 7. Empirical, 6° angle for end of groin field transition region "taper" geometry (Corps of Engineers, Coastal Engineering Manual, Vol V, 2006).

If a single groin was proposed in lieu of the two-groin tapered option, the single groin would need to be longer than the existing groin to maintain a minimum updrift beach width, and additional sand beyond what is proposed would be required. A single, longer groin would also result in a wider transition region between the groin and the downdrift beach, causing bypassing sand to return to the beach further south than what is proposed with the transitional two-groin system. It is also possible that a longer single groin could result in the jetting of bypassing sand offshore, with no return to the downdrift beach, potentially resulting in adverse impacts to the south end of Sea Island, Gould's Inlet, and possibly St. Simons Island.

Therefore, although this alternative is practicable, it is likely that it would result in the sand bypassing the southern end of Sea Island and potentially jetting the sand offshore and completely out of the sand sharing system. As a result, this alternative is not considered the least environmentally practicable alternative. On-site alternative 1 (the applicant's preferred alternative): This alternative consists of the construction of a T-head groin and renourishment of 17,000 LF of shoreline. The applicant's preferred alternative is to construct and maintain a

new T-head groin south of the existing southern groin and place sand along approximately 17,000 linear feet (LF) of beach located between an existing north groin, and the proposed new T-head groin. A hydraulic cutter-head dredge would pump between 1,315,000 to 2,500,000 cubic yards (CY) of sand from the offshore source, to various locations along the beach. Temporary sand-training dikes would be constructed on the beach, and used to contain the discharge of sand and water, parallel to the shore. Once it is dewatered, bulldozers and other equipment would be used to move the sand up and down the beach, to shape the beach to the design template. Following completion of beach renourishment, sand fencing and/or native vegetation would be installed in strategic locations in the dunes in accordance with a Georgia Department of Natural Resources (DNR)-approved vegetation plan.

As proposed, the groin would extend 350' into the Atlantic Ocean with a variable crest height of 3-6'. The low profile would allow sand to pass over and around the structure. In addition, the groin would be constructed of two feet-diameter granite armor stone; with a core component of smaller diameter stone. The use of the armor stone would allow for a large void ratio, thus providing the "leaky" characteristic that allows sand to pass through the structure. To prevent settlement of the stone, and if necessary to facilitate modification or removal of the groin, a base layer of geo-textile matting (one-foot thick) would be installed below grade prior to armor stone placement.

The project would also result in reestablishment of the 17,000 linear feet of high tide (i.e. dry sand) beach and the dune system. The dune system would provide storm protection and reestablish sea turtle nesting habitat damaged by the hurricanes as well as create new nesting habitat. Given the above, the applicant's preferred alternative is the LEDPA.

6.0 Evaluation for Compliance with the Section 404(b)(1) Guidelines. The following sequence of evaluation is consistent with 40 CFR 230.5

6.1 Practicable alternatives to the proposed discharge consistent with 40 CFR 230.5(c) are evaluated in Section 5. The statements below summarize the analysis of alternatives.

In summary, based on the analysis in Section 5.0 above, the no-action alternative, which would not involve discharge into waters, is not practicable.

For those projects that would discharge into a special aquatic site and are not water dependent, the applicant has demonstrated there are no practicable alternatives that do not involve special aquatic sites.
It has been determined that there are no alternatives to the proposed discharge that would be less environmentally damaging. (Subpart B, 40 CFR 230.10(a)). The proposed discharge in this evaluation is the practicable alternative with the least adverse impact on the aquatic ecosystem, and it does not have other significant environmental consequences.

6.2 Candidate disposal site delineation (Subpart B, 40 CFR 230.11(f)). Each disposal site shall be specified through the application of these Guidelines:

Discussion: As proposed, the project would consist of the construction of a T-head groin and the renourishment (i.e. beach fill) of 17,000 linear feet of shoreline. Construction of the groin would result in the fill of 0.33 acre of the surf zone of the Atlantic Ocean. The beach fill would result in approximately 200 acres of willow beach and inshore habitat (ocean shoreline. The surf zone, which includes subtidal and intertidal areas, generally includes the area from the point at which waves are cresting off a beach to the highest point at which a wave washes on shore.

6.3 Potential impacts on physical and chemical characteristics of the aquatic ecosystem (Subpart C 40 CFR 230.20). See Table 1:

Table 1 – Potential Impacts on Physical and Chemical Characteristics

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

Discussion:

Substrate: As proposed, the project would result in the dredging/removal of approximately 1.3-2.5 million CYs of sand from an offshore borrow site and

pumping it onto the intertidal beach and in the surf zone. The removal of the sand would result in a long-term minor effect to the substrate within the borrow site. In addition to potential effects to the borrow site, the placement of the sand would result in the burial of the existing substrate on the beach and within the intertidal and surf zones. However, analysis of the offshore borrow site indicates that the material to be dredged from the site is compatible with the Georgia standards for beach fill (i.e. is considered beach quality sand). Therefore, any sand placed is similar to the existing substrates and as a result, it is anticipated that the effects of sand placement onto the beach and in the intertidal and surf zones would be negligible.

Suspended particulates/turbidity: The re-suspension of sediments (i.e. plumes) during dredging and placement of the sand could result in minor, temporary adverse impacts to turbidity, total suspended solids and dissolved oxygen in the water column within and near the excavation and discharge site. Prolonged sediment suspension and extensive turbidity plumes are primarily associated with the suspension of fine silt/clay particles that have relatively slow settling velocities, whereas the sands resettle rapidly in the immediate vicinity of the dredge. Analysis of the offshore borrow site indicates that the material to be dredged from the site is compatible with the Georgia standards for beach fill (i.e. is considered beach quality sand). Therefore, it is anticipated that the effects of dredging induced sediment suspension would be short-term and minor.

Construction of the groin would produce temporary increases in suspended sediment concentrations and turbidity in the water column of the surrounding area. However, the sediment resuspension/redeposition is typically localized and short-term when the substrate material is composed of relatively clean sand with a minimal fine silt/clay fraction. Thus, it is anticipated that sediment suspension effects associated with the groin construction also would be minor, short-term, and localized.

Water: The re-suspension of sediments (i.e. plumes) during dredging at the offshore borrow site could result in minor, temporary adverse impacts to turbidity, total suspended solids and dissolved oxygen in the water column within the excavation site. However, these effects are typically short-term and localized when the dredged material is composed of relatively clean sand with a minimal fine silt/clay fraction. As discussed above, all potential beach fill deposits from the borrow site are composed of highly compatible sands. Therefore, it is anticipated that the effects of dredging-induced sediment suspension on water quality would be short-term and localized.

In addition to potential effects at the borrow site, sand placement operations would produce temporary increases in suspended sediment concentrations and

turbidity. However, turbidity increases are typically confined to the surf zone in the immediate vicinity of the slurry discharge point. Furthermore, it is anticipated that the use of compatible beach fill with minimal fines and the use of temporary dikes to contain the discharged sand slurry would reduce the extent of sediment suspension. Therefore, it is anticipated that sediment suspension effects attributable to sand placement would also be short-term and localized.

By letter dated June 8, 2018, the Georgia Department of Natural Resources, Environmental Protection Division issued the 401 Water Quality Certification for the project. Based on the short-term and localized nature of the anticipated sediment suspension effects, the project would have a short-term minor effect on water quality.

Current Patterns and Water Circulation: The project site is located within the surf zone of the Atlantic Ocean and is subject to semi diurnal tides. The project would have no effect on the current tidal cycle (i.e. it would remain diurnal). However, as proposed, the project would result in the reestablishment of a high tide beach for approximately 17,000 linear feet of the Sea Island shoreline. Reestablishment of the high tide beach would increase the width of the beach and decrease the extent of tide in these areas.

In addition, the proposed groin could alter water circulation and current patterns by blocking the longshore current as it travels south. Given the relatively short length of the in-water groin segment (~350 ft seaward of the MHW line), it is expected that effects on the longshore current would be minimal. Additionally, the groin fillet would establish a gradual transitional shoreline between the Sea Island oceanfront beach and the seaward terminus of the terminal groin, thus further minimizing effects on longshore currents. It is expected that groin-related effects on longshore current dynamics would be minimal and highly localized to the groin structure.

Therefore, when considering all the above, the project would result in a short-term minor effect on current patterns and water circulation.

Normal Water Fluctuations: The project site is located within the surf zone of the Atlantic Ocean and is subject to semi diurnal tides. The project would have no effect on the current tidal cycle. However, as proposed, the project would result in the reestablishment of a high tide beach for approximately 17,000 linear feet of the Sea Island shoreline. Reestablishment of the high tide beach would increase the width of the beach and decrease the extent of tide in these areas. Therefore, the project would result in a long-term minor effect in normal water fluctuations.

Salinity: The project site is located within the surf zone of the Atlantic Ocean and is subject to semi diurnal tides. The placement of sand in the ocean would not alter the salinity within the ocean nor would it alter the salinity gradients within

nearby inlets/estuaries (i.e. Gould's Inlet and/or the Hampton River). In addition, although the proposed groin may alter current patterns/water circulation, these effects would be minute and localized to the project area. Therefore, the Corps has determined that the project would result in a negligible effect on salinity.

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

6.4.1 Potential impacts on the biological characteristics of the aquatic ecosystem (Subpart D 40 CFR 230.30). See Table 2:

Table 2 – Potential Impacts on Biological Characteristics						
Biological characteristics	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Major Effect
Threatened and endangered species			X			
Fish, crustaceans, mollusk, and other aquatic organisms				X		
Other wildlife				X		

Discussion:

Threatened and endangered species: The applicant's agent provided a biological assessment (BA) documenting that the following species may be within or near the project site: Green sea turtle (*Chelonia mydas*), Hawksbill sea turtle (*Eretmochelys imbricata*), Leatherback sea turtle (*Dermochelys coriacea*), Loggerhead sea turtle (*Caretta caretta*), Kemp's Ridley sea turtle (*Lepidochelys kempii*); Piping Plover (*Charadrius melodus*), Red knot (*Calidris canutus rufa*), Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*), Shortnose Sturgeon (*Acipenser brevirostrum*), West Indian Manatee (*Trichechus manatus*), and the North Atlantic Right Whale (*Eubalaena glacialis*). In addition, critical habitat for the Piping plover has been designated both north and south of the project area and critical habitat for the North Atlantic right whale has been designated adjacent to and east of the project area.

Regarding impacts to sea turtles, in order for sea turtles to nest and the eggs to remain viable, dry sand must be available along the shoreline. As documented by the applicant (Oertel/Basco report) as well as members of the public (Jackson

and Webb reports), the Island has experienced various rates of shoreline retreat since the 1860's. By the 1970's the majority of the high tide beach (i.e. dry sand beach) had eroded. As a result, the beach between the existing groins has undergone continued renourishment (i.e. pumping sand from offshore sources and/or sand recycling events) since the mid 1980's to maintain the dry sand beach. It is likely that without continued renourishment of the beach and the groins to hold the sand in place, there would be very little dry sand beach along the majority of the Sea Island shoreline and therefore sea turtle nesting would be diminished.

Currently the area between the proposed groin and southern groin experiences erosion that limits the available beach for turtle nesting. Subsequently, there is very little (if any) dry sand beach between the proposed groin and existing southern groin. Although the sea turtles could nest in areas where the escarpment has sloughed (creating an area of dry sand for the turtle), the Georgia Department of Natural Resources, Wildlife Resources Division (Georgia DNR, WRD) has established protocol to relocate sea turtle nests in this area (and in any area that is subject to inundation by the tide) to a dry sand beach. This protocol is a part of the Sea Island Sea Turtle Program, which monitors sea turtles and provides education to residents and visitors. In addition, the program conducts daily dawn patrols of the 5-mile beach during nesting season and hatching season using the protocols developed by Georgia DNR, WRD.

The proposed project would create a dune field in this area as well as repair the dune field between the existing groins that has been damaged by recent hurricanes. Therefore, the project overall would provide additional dry sand beach for turtle nesting and could reduce the amount of nest relocations performed by Georgia DNR. In addition, all new work (i.e. construction of the groin and initial renourishment event) would occur outside of sea turtle nesting season (see section 11 for special conditions).

As stated by NMFS, PRD, in their October 19, 2017, concurrence letter, the placement of the groin could trap sea turtle hatchlings within the rocks along the groin or within eddies associated with the groin. The groin could also provide new habitat for birds that might prey on hatchlings as they swim past the groin. However, per Georgia DNR's protocol, all sea turtle nests in close proximity to the land end of the groin would be relocated away from the groin annually. This would lessen the likelihood of emerging hatchlings encountering the groin since they would start their migration further away from the groin. Therefore, the chance of a sea turtle hatchling becoming entrapped or preyed upon at the groin would be minimal as most hatchlings would not be found in close proximity to the groin because their nests would be relocated away from the base of the groin.

Regarding impacts to the piping plover, the species prefers to utilize uninhabited areas of the shoreline (i.e. away from human interaction) and are therefore found

primarily at the northern and southern ends of inhabited islands. According to the BA, "due to the Sea Island development, high usage, and high traffic, piping plover usage near or within the proposed project area is expected to be low." Regarding piping plover critical habitat, the listed critical habitat is located outside the project site. Therefore there would be no direct effect to critical habitat. Indirectly, continued erosion of the spit could result in adverse effects to listed critical habitat. However, as stated above, the proposed project would not increase erosion of the spit in a measurable amount. Therefore, the Corps has determined that the project would have no effect on piping plover critical habitat.

Regarding impacts to the red knot, short term, any red knots currently utilizing the area could be disturbed by equipment during construction. However the species are known to readily adapt to relocation and could relocate to nearby habitat both downstream and upstream of the project site. Longterm, the proposed project would expand the potential habitat for the Red knot. Indirectly, continued erosion of the spit would result in reduced habitat for wildlife utilizing the area, including the above birds. However, as stated above, proposed project would not increase erosion of the spit in a measurable amount.

Regarding impacts to the West Indian manatee, the species lives in riverine and coastal areas with fresh, brackish or salt water and prefer willow, near-shore areas where they feed on submergents (i.e. seagrass and eelgrass beds) and floating or emergent vegetation (i.e. salt marsh). There is no submerged, floating or emergent vegetation located on the project site. Salt marsh is located west of the project site and continued erosion of the shoreline could result in impacts to the salt marsh. As stated above, the proposed project would not increase erosion of the spit in a measurable amount. Therefore no impacts to the above habitats are anticipated. However, the species is known to migrate up and down the coast and therefore could be affected by the dredging equipment. The species is considered to be a curious mammal and that tends to not shy away from human or vessel interactions and is relatively slow in their movements. Therefore, mortality is often the result of vessel strikes. Any draft permit issued for the project would include a special condition requiring the permittee to adhere to the Savannah District Manatee Special Conditions for Aquatic Construction. With the implementation of the above special conditions, the project is not likely to adversely affect the West Indian manatee.
Based on the applicant's biological assessment and the information above, the Corps has determined that the proposed project may affect, but is not likely to adversely affect the following species: Green sea turtle (*Chelonia mydas*), Hawksbill sea turtle (*Eretmochelys imbricata*), Leatherback sea turtle (*Dermochelys coriacea*), Loggerhead sea turtle (*Caretta caretta*), Kemp's Ridley sea turtle (*Lepidochelys kempii*); Piping Plover (*Charadrius melodus*), Red knot (*Calidris canutus rufa*), Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*), Shortnose Sturgeon (*Acipenser brevirostrum*), West Indian Manatee (*Trichechus manatus*), and the North Atlantic Right Whale (*Eubalaena glacialis*).

By letter dated May 10, 2017, the Corps forwarded the biological assessment to NMFS, PRD requesting concurrence on the above effects determination on the species within their purview. By letter dated October 19, 2017, the NMFS, PRD concurred stating "Because all potential project effects to listed species were found to be discountable, insignificant, or beneficial, we conclude that the proposed action is not likely to adversely affect listed species under NMFS's purview. This concludes your consultation responsibilities under the ESA for species and proposed critical habitat under NMFS's purview."

Since that time, the project was amended to include the renourishment of 17,000 LF of the Sea Island shoreline with the sand being pumped (via a hydraulic cutterhead dredge) from an offshore borrow site. Subsequently, the applicant provided an updated BA. The potential impacts of hydraulic cutterhead dredging on sea turtles has been considered by NMFS in their 1991, 1995, and 1997 South Atlantic Regional Biological Opinions (SARBO). Under each biological opinion the NMFS determined that cutterhead pipeline dredging may affect but is not likely to adversely affect sea turtles. Pipeline dredges are relatively stationary and therefore act on only small areas at any given time. The cutterhead works most efficiently buried within thick sediment deposits and is not frequently exposed to open water when dredging. Therefore, for a turtle to be taken with a pipeline dredge, it would have to approach the cutterhead within the sediment and be caught in the suction. There is also the potential that a turtle could become entangled in the buoy lines that anchor the pipeline. However, any draft permit issued for the project would include a special condition requiring the permittee to utilize either of the following materials: (1) Light weight chain; (2) Non-looping wire rope; and (3) Plastic sheathing around nylon rope to prevent looping. The use of the above material would minimize the potential for any slack occurring in the line and thus reduce the potential of sea turtle entanglements. In addition, all new work (i.e. groin construction, dredging and initial sand placement) would occur outside of sea turtle nesting season.

Regarding potential impacts to shortnose and Atlantic sturgeon associated with the dredging, potential direct and indirect impacts would include entrainment and/or capture of adults, juveniles, larvae, and eggs by dredging activities, short-term impacts to foraging and refuge habitat, water quality, and sediment quality, and disruption of migratory pathways. According to the BA, both sturgeon species occupy much of the same habitat. Spawning occurs in freshwater tributaries, after which the species move downstream and spend the rest of the year in coastal plain rivers, estuaries, or along the coast within a few miles of the shore.

Dredging would occur at an offshore borrow site where adult and older juvenile sturgeon may be located. Adult and juvenile sturgeons are believed to be very mobile, even when occupying resting areas during the summer months (deep

holes and other deep areas). Therefore, the activity and noise from dredging operations should deter sturgeon from swimming in the area.

Two species of whale, the humpback whale and the North Atlantic right whale, may occur in the project area. In addition, the offshore borrow site is located in an area designated as critical habitat for the North Atlantic right whale. Potential effects to the above whales from a hydraulic cutterhead were evaluated during programmatic consultation (South Atlantic Regional Biological Assessment/South Atlantic Regional Biological Opinion (SARBA/SARBO)) between the Corps and the NMFS, PRD. Specifically, SARBA/SARBO determined that hydraulic cutterhead dredging may effect, but is not likely to adversely affect the above whales and would not result in adverse modification to listed critical habitat for the North Atlantic right whale.

The Corps has determined that the dredging of sand and its subsequent placement onto the beach is covered under the SARBA/SARBO. In addition, the amended project does not change the analysis of the potential effects the proposed groin would have on threatened and endangered species. Therefore, the Corps has determined that the construction of the groin is covered under the October 2017 Section 7 consultation with NMFS, PRD.

Regarding the species under the purview of the USFWS, by letter dated March 20, 2018, the Corps forwarded the updated biological assessment to USFWS requesting concurrence on the above effects determination. By letter dated May 22, 2018, the USFWS concurred with the above effects determination.

Fish, crustaceans, mollusk, and other aquatic organisms:

During dredging operations, resuspension, and redeposition of sediments may impact benthic communities within and adjacent to the borrow site through burial, adverse effects on the gill-breathing and filter-feeding abilities of benthic organisms, and/or adverse effects on the foraging and/or predator avoidance behaviors of visually-oriented fishes. However, the sediment resuspension/redeposition is typically localized and short-term when the dredged material is composed of relatively clean sand with a minimal fine silt/clay fraction. Sediments associated with the offshore borrow areas are composed of beach compatible sand with a very small fine sediment fraction, thus indicating that the effects of dredging-induced sediment suspension and redeposition would be short-term and localized.

Losses of benthic invertebrates within the borrow site dredging footprints may negatively affect the foraging activities of predatory fishes potentially inducing them to seek out alternative soft bottom foraging habitats. However, it is anticipated that the effects of prey loss on these fishes would be localized and short-term based on the following considerations: 1) early recruitment of

opportunistic benthic taxa to the disturbed areas would provide substantial prey resources within a relatively short period of time, 2) these fishes are highly mobile and capable of seeking out alternative habitats, and 3) the distribution of alternative soft bottom habitats within the overall Permit Area is expansive. The delivery of dredged sand to the beach would involve the placement of pipelines on the subtidal seafloor, resulting in additional direct impacts on soft bottom communities; however, it is anticipated that pipeline impacts would be negligible since the impacts would be confined primarily to a narrow strip of substrate underlying the pipelines, and the extent of physical habitat disturbance would be minimal once the pipelines are removed.

Sand placement on top of the existing intertidal beach and the surf zone substrate generally eliminates the majority of the benthic invertebrates through direct burial. The subsequent process of benthic community recovery is generally rapid. However, recovery rates vary according to a number of operational and environmental variables. The principal project-related factors that influence benthic community recovery rates are the compatibility of the beach fill sediments with those of the native beach and the timing of nourishment projects relative to spring benthic larval recruitment periods (Wilber et al. 2009, Peterson et al. 2006, and Hackney et al. 1996). Most benthic recovery studies have reported rapid recovery within one year of the initial impact when highly compatible beach fill sediments were used and larval recruitment periods were avoided (Jutte et al. 1999a, Burlas et al. 2001, Van Dolah et al. 1994, Van Dolah et al. 1992, Gorzelany and Nelson 1987, Salomon and Naughton 1984, Parr et al. 1978, and Hayden and Dolan 1974).

As previously described, sediment analyses have demonstrated the compatibility of all proposed beach fill material in accordance with state technical standards. Furthermore, adherence to a 1 November - 30 April environmental nourishment window would avoid peak benthic invertebrate recruitment periods in GA. It is expected that the use of compatible sediments and avoidance of peak recruitment periods would facilitate relatively rapid benthic community recovery. Therefore, it is expected that the impacts of sand placement on benthic communities would be short term and localized under.

Subsequent to the initial placement of sand, the beach profile equilibration process would result in some of the material being transported seaward and deposited on nearshore soft bottom habitats located seaward of the beach fill footprints. However, based on the opportunistic nature of the dominant benthic community and the gradual pace of the equilibration process (approximately six months), it is expected that benthic community adjustments would occur with only minor, short-term reductions in community levels of abundance, diversity, and biomass. Losses of benthic invertebrates may negatively affect the foraging activities of surf zone fishes (e.g., flounders, rays, spots, and croakers), potentially inducing fishes to seek out alternative soft bottom foraging habitats.

However, it is anticipated that the effects of prey loss on these fishes would be localized and short-term based on: 1) the ability of some benthic species to tolerate shallow sediment deposition, 2) the anticipated rapid rates of benthic community recovery in the surf zone, 3) the mobility of surf zone fishes, and 4) the expansive distribution of alternative soft bottom habitat within the Permit Area (i.e. Atlantic Ocean).

Direct effects of the proposed groin would consist of the permanent loss of unconsolidated bottom habitat directly underneath the proposed structure as well as the potential creation of a trap for pelagic eggs and larvae that could then be preyed upon. However, the footprint of the project (i.e. the groin and beach renourishment activities) represents a relatively small area of habitat (i.e. the Atlantic Ocean and shoreline) that is utilized by the above species. In addition, ample habitat is located both upstream and downstream of the project site that these species could relocate to.

The redeposition of sediments that are temporarily suspended by the groin construction process may have additional temporary impacts on soft bottom communities adjacent to the groin footprint. However, groin construction would occur within the surf zone where sediments consist of relatively coarse-grained sands with a very small fine sediment fraction. Thus, it is anticipated that sediment suspension and redeposition effects would be minor, short-term, and localized.

When considering all the above, the Corps has determined that the proposed project would have a short-term minor effect to fish, crustaceans, mollusk, and other aquatic organisms.

Other wildlife: Regarding impacts to wildlife, during construction, wildlife in the vicinity of the project could be affected by noise generated from the construction equipment as well as the movement of the equipment during placement of the sand and construction of the beach profile and dune system. However, these affects would be temporary and subside upon completion of the project. In addition, similar habitats (i.e. ocean and beach) are located near the vicinity of the project. Any wildlife disturbed by the project construction could relocate to these nearby habitats.

Any reduction in prey, could result in adverse effects to shorebirds, such as reduced survivability or productivity, particularly in the case of migratory shorebirds that use beaches as stopover refueling sites. However, it is anticipated that relatively rapid benthic recruitment would provide substantial prey resources along the disturbed reaches within a relatively short period of time, and substantial undisturbed intertidal beach foraging habitat would be available within the Permit Area during benthic recovery periods. Therefore, it is

anticipated that the effects of benthic prey loss on shorebirds would be short term and localized.

As stated above, continued erosion of the spit would result in reduced habitat for the wildlife currently utilizing the area. However, the addition of the new groin and sand placement is not expected to increase the erosion rate in a measurable way. When considering all the above, the Corps has determined that the proposed project would have a short-term minor effect to other wildlife.

6.4.2 Potential impacts on special aquatic sites (Subpart E 40 CFR 230.40). See Table 3:

Table 3 – Potential Impacts on Special Aquatic Sites

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

Discussion:

Sanctuaries and Refuges: There are no sanctuaries or refuges located on or near the project site. Therefore, the project would have no effect on this factor. Wetlands: There are no wetlands located on the project site. However, salt marsh is located west of the project site and continued erosion of the shoreline could result in impacts to the salt marsh. The proposed project would not increase erosion of the spit in a measurable amount. Therefore, impacts to the wetlands, including salt marsh are anticipated to be negligible.

Mud flats: There are no mud flats located on or near the project site. Therefore, the project would have no effect on this factor.

Vegetated shallows: There are no vegetated shallows located on or near the project site. Therefore, the project would have no effect on this factor.

Coral reefs: There are no coral reefs located on or near the project site. Therefore, the project would have no effect on this factor.

6.4.3 Potential impacts on human use characteristics (Subpart F 40 CFR 230.50). See Table 4:

Table 4 – Potential Impacts on Human Use Characteristics

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

Discussion:

Municipal and private water supplies: The proposed project consists of the construction of a groin and beach renourishment for the primary purpose of storm protection. The project site is not a source of potable water and would not require any water withdrawals. However, the project would result in the construction of a dune system that would serve as storm protection to the developed uplands, including infrastructure such as water utilities. Therefore, the Corps has determined that the project would have a beneficial effect on municipal and private water supplies.

Recreational and commercial fisheries: Potential effects to recreation (including recreational fisheries) are discussed in Section 7.1 of this document.

Regarding commercial fisheries, there are no commercial fisheries (i.e. aquaculture) located within the project site. However, dredging equipment at the borrow site could pose an obstruction to commercial fishing vessels near the dredge site. However, the pipeline would be placed on the ocean floor and marked with buoys.

In addition, the Corps would include the following special condition in any proffered permit issued for the proposed project, "That use of the permitted activity must not interfere with the public's right to free navigation in the Atlantic Ocean, a navigable water of the United States." When considering all aspects of the proposed project, the Corps has determined that the project would have a negligible effect on navigation.

Water-related recreation: Potential effects to recreation (including recreational fisheries) are discussed in Section 7.1 of this document.

Aesthetics: Potential effects to aesthetics (including recreational fisheries) are discussed in Section 7.1 of this document.

Parks, national and historical monuments, national seashores, wilderness areas, research sites, and similar preserves: There are no parks, national and historical monuments, national seashores, wilderness areas, research sites, and/or similar preserves located within the project site. However, parks and historical monuments are located in the upland. The purpose of the project is to provide storm protection to the developed uplands, which would include these areas. Therefore, the project would have a minor long-term beneficial effect to this factor.

6.5 Pre-testing evaluation (Subpart G, 40 CFR 230.60):

The following has been considered in evaluating the biological availability of possible contaminants in dredged or fill material. See Table 5:

Table 5 – Possible Contaminants in Dredged/Fill Material	
Physical characteristics	X
Hydrography in relation to known or anticipated sources of contaminants	
Results from previous testing of the material or similar material in the vicinity of the project	
Known, significant sources of persistent pesticides from land runoff or percolation	

Table 5 – Possible Contaminants in Dredged/Fill Material	
Spill records for petroleum products or designated (Section 331 of CWA) hazardous substances	
Other public records or significant introduction of contaminants from industries, municipalities, or other sources	
Known existence of substantial material deposits of substances which could be released in harmful quantities to the aquatic environment by man-induced discharge activities	

Discussion: As proposed, the project would result in the hydraulic cutterhead dredging of 1.3-2.5 million CYs of sand from an offshore borrow site. As previously described, sediment analysis has demonstrated the compatibility of all proposed beach fill material in accordance with state technical standards.

6.6 Actions to minimize adverse impacts (Subpart H). The following actions, as appropriate, have been taken through application of 40 CFR 230.70-230.77 to ensure minimal adverse effects of the proposed discharge. See Table 6:

Table 6 – Actions to Ensure Adverse Effects are Minimized	
Actions concerning the location of the discharge	X
Actions concerning the material to be discharged	X
Actions controlling the material after discharge	X
Actions affecting the method of dispersion	X
Actions affecting plant and animal populations	

Discussion: In addition to the special conditions proposed in Section 11, the applicant would use temporary sand training dikes to contain the discharged sand slurry. As proposed, the sand slurry discharge would be pumped behind the dikes and the slurry would be allowed to dewater prior to the sand being redistributed along the beach. The use of the temporary dikes would reduce the extent of sediment resuspension in the surf zone as well as ensure that the sand to be discharged is compatible with the beach.

6.7 Factual Determinations (Subpart B, 40 CFR 230.11). The following determinations are made based on the applicable information above, including actions to minimize effects and consideration for contaminants. See Table 7:

Table 7 – Factual Determinations of Potential Impacts						
Site	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Major Effect
Physical substrate				X		
Water circulation, fluctuation and salinity				X		
Suspended particulates/turbidity				X		
Contaminants		X				
Aquatic ecosystem and organisms				X		
Proposed disposal site				X		
Cumulative effects on the aquatic ecosystem				X		
Secondary effects on the aquatic ecosystem				X		

Discussion:

Physical substrate: See discussion above at 6.3.

Water circulation, fluctuation and salinity: See discussion above at 6.3.

Suspended particles/turbidity: See discussion above at 6.3.

Contaminants: See discussion above at 6.5.

Aquatic ecosystem and organisms: See discussion above at 6.4.

Proposed disposal site: No dredging or dredged material disposal is proposed.

Cumulative effects on aquatic ecosystem: See discussion below at 8.0.

Secondary effects on aquatic ecosystem: See discussion below at 8.0.

6.9 Findings of compliance or non-compliance with the restrictions on discharges (40 CFR 230.10(a-d) and 230.12). Based on the information above, including the factual determinations, the proposed discharge has been evaluated to determine whether any of the restrictions on discharge would occur. See Table 8:

Table 8 – Compliance with Restrictions on Discharge		
Subject	Yes	No
1. Is there a practicable alternative to the proposed discharge that would be less damaging to the environment (any alternative with less aquatic resource effects, or an alternative with more aquatic resource effects that avoids other significant adverse environmental consequences?)		X
2. Will the discharge cause or contribute to violations of any applicable water quality standards?		X
3. Will the discharge violate any toxic effluent standards (under Section 307 of the Act)?		X
4. Will the discharge jeopardize the continued existence of endangered or threatened species or their critical habitat?		X
5. Will the discharge violate standards set by the Department of Commerce to protect marine sanctuaries?		X
6. Will the discharge cause or contribute to significant degradation of waters of the U.S.?		X
7. Have all appropriate and practicable steps (Subpart H, 40 CFR 230.70) been taken to minimize the potential adverse impacts of the discharge on the aquatic ecosystem?	X	

7.0 General Public Interest Review (33 CFR 320.4 and RGL 84-09)

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

7.1 All public interest factors have been reviewed and those that are relevant to the proposal are considered and discussed in additional detail. See Table 9 and any discussion that follows.

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

Table 9: Public Interest Factors	Effects					
	None	Detrimental	Neutral (mitigated)	Negligible	Beneficial	Not Applicable
21. Needs and Welfare of the People: See below for discussion.				X		

Additional discussion of effects on factors above:

(1) Conservation: The applicant has placed a conservation easement on the remaining southern portion of the Island. As stated above, it is unlikely that the construction of a new shorter groin just south of the existing southern groin would interrupt sediment transport in any measurable way under the current system. Therefore, the proposed project would not exacerbate ongoing erosion of the downdrift shoreline.

In addition, any draft permit issued for the proposed project would include requirements to monitor sand movement within the southern groin and proposed new groin as well as down drift of the groins. This monitoring would be accomplished through extensive surveying of the shoreline in these areas both pre and post construction. Should the monitoring/surveying indicate that the new groin is trapping sand, the applicant would be required to submit a corrective action plan (i.e. sand bypass, adjustment/removal of the new groin, etc.). For specific monitoring requirements, refer to section 11.

Therefore, when considering the above information, the Corps has determined that the proposed project would have a negligible effect on conservation.

(2) Economics: The project site is located on Sea Island. Sea Island is a barrier Island that consists of a resort development (i.e. the Sea Island Beach Club) as well as private residential homes. The purpose of the project is to provide storm protection to the developed areas and upland lots. Specifically, the project would result in the reestablishment of the high tide beach and dune systems that have eroded due to natural processes (i.e. storms, sea level rise, etc.) and the hard armoring of the shoreline. Without this renourishment, the beach club and private property owners would be subject to further erosion that could result in a loss in the beach and subsequently reduce property values. In addition, the loss in the high tide beach would reduce recreation on the beach which would reduce the current equipment rental operations (i.e. beach chairs, umbrellas, bikes,

kayaks, etc.). Therefore, the Corps has determined there would be a minor benefit with respect to economic factors.

(3) Aesthetics: The project site is located in the Atlantic Ocean, along the existing beach at Sea Island. As proposed, the project would reestablish the high tide beach and dune system through the construction of a T-head groin and placement of sand along 17,000 LF of shoreline. Specifically, 1.3-2.5 million CYS of sand would be hydraulically dredged from an offshore borrow site and pumped onto the shoreline. Sediment analysis of the borrow site indicates that the proposed material meets GA technical standards for beach placement. Therefore the material would not be out of character with the surrounding beach and the proposed work would not change the current land use.

During dredge events there would be a short term minor adverse effect on aesthetics due to the operation of the dredge equipment. However, this effect would subside upon completion of the dredging event.

When considering all aspects of the proposed project, the Corps has determined that the proposed project would have a minor benefit to aesthetics.

(4) General Environmental Concerns: The environmental concerns for this project focus on the potential impacts on water quality, fish, wildlife, shoreline erosion and accretion and safety. Each of these concerns was discussed above and/or below. No other more than minimal adverse environmental impacts are anticipated. Therefore, the Corps has determined that the proposed project would have negligible effect on general environmental concerns.

(6) Historic Properties: During previous permit evaluations, the Corps determined that there were no cultural resource sites located within the surf zone where the sand would be placed. The beach between the existing groins has been repeatedly renourished since the Mid-1980s. In addition, the applicant performed an underwater survey of the offshore borrow site. Based on results of this survey, the Corps determined that the proposed project would have no adverse effect on cultural resources or historic properties. By letter dated July 6, 2018, the Georgia Department of Natural Resources, State Historic Preservation Department concurred with the above effects determination.

(7) Fish and Wildlife Values: The effects to fish and wildlife values were discussed in Section 6.4.1 of this document. Based on that evaluation, the Corps has determined that the proposed project would have a short-term detrimental effect on fish and wildlife values.

(8) & (9) Flood Hazards and Floodplain Values: As proposed, the project would reestablish the high tide beach and dune system through the construction of a T-head groin and placement of sand along 17,000 LF of shoreline. Specifically, 1.3-2.5 million CYs of sand would be hydraulically dredged from an offshore borrow site and pumped onto the shoreline. The reestablishment of the high tide beach and reconstruction of the dune system would mitigate the erosional effects of sea level rise and provide storm protection to the developed uplands.

The proposed project would include the construction of a groin within the surf zone of the Atlantic Ocean. However, the weight of the materials in which the groin would be constructed from, it is not anticipated that the groin would be subject to mobilization during a flood event.

In addition, the applicant would be responsible for ensuring that the project complies with all rules, regulations, and/or requirements of the Federal Emergency Management Agency (FEMA) with regard to flood plains and floodways. A special condition requiring compliance with applicable FEMA regulations would be included in any draft permit, which may be issued for this project. When considering all aspects of the proposed project, the Corps has determined that the project would have a beneficial effect with respect to these factors.

(10) Land Use: The project site is located along the shoreline of Sea Island, within the surf zone of the Atlantic Ocean. Dredging the offshore borrow site would remove between 1.3-2.5 million CYs of sand from ocean floor. However, it is anticipated that through natural processes (i.e. waves, currents, etc.), the site would be replenished with sand. Therefore, there would be a long-term minor detrimental effect to land use associated with the borrow site.

The project would reestablish the high tide beach and dune system through the construction of a T-head groin and placement of sand along 17,000 LF of shoreline. Specifically, 1.3-2.5 million CYS of sand would be hydraulically dredged from an offshore borrow site and pumped onto the shoreline. Sediment analysis of the borrow site indicates that the proposed material meets GA technical standards for beach placement. Therefore the material would not be out of character with the surrounding beach and the proposed work would not change the current land use. Given the above evaluation, the Corps has determined that the proposed project would have a negligible effect on land use.

(11) Navigation: The project site is located along the shoreline of Sea Island, within the surf zone of the Atlantic Ocean. The terminal groin would not be located in a navigation channel, but would constitute a potential hazard to small recreational watercraft operating in close proximity to the shoreline. As a potential hazard to navigation, the terminal groin would be subject to USCG approval and marking requirements in accordance with 33 CFR 64. Marking requirements would be determined by the USCG, and once established would be maintained in perpetuity or until the groin is removed. During dredging operations, the pipeline could create an obstruction to navigation. However, the pipeline would be placed on the ocean floor and marked with buoys.

In addition, the Corps would include the following special condition in any proffered permit issued for the proposed project, "That use of the permitted activity must not interfere with the public's right to free navigation in the Atlantic Ocean, a navigable water of the United States." When considering all aspects of the proposed project, the Corps has determined that the project would have a negligible effect on navigation.

(12) Shoreline Erosion and Accretion: The reestablishment of the high tide beach and reconstruction of the dune system would mitigate the erosional effects of sea level rise and provide storm protection to the developed uplands. The project would introduce between 1.3-2.5 million CYs of sand from an offshore source into the groin field, and subsequently supplement the sand sharing system. It is likely that the introduction of this additional sand would allow the beach between the groins to eventually reach an equilibrium state and thus allow some sand to bypass the groins and travel downdrift to the spit and potentially to St. Simon's Island, including East Beach.

In addition, any draft permit issued for the proposed project would include requirements to monitor sand movement within the southern groin and proposed new groin as well as down drift of the groins. This monitoring would be accomplished through extensive surveying of the shoreline in these areas both pre and post construction. Should the monitoring/surveying indicate that the new groin is trapping sand, the applicant would be required to submit a corrective action plan (i.e. sand bypass, adjustment/removal of the new groin, etc.). For specific monitoring requirements, refer to section 11.

When considering all of the previous information, the Corps has determined that the proposed project would have a minor beneficial effect on shoreline erosion and accretion.

(13) Recreation: Sea Island is a barrier Island that consists of a resort development (i.e. the Sea Island Beach Club) as well as private residential homes. The reestablishment of the high tide beach would maintain and potentially increase recreation on the beach. When considering all aspects of the proposed project, the Corps has determined that the proposed project would have a minor benefit to recreation.

(14) Water Supply and Conservation: The proposed project consists of the construction of a groin and beach renourishment for the primary purpose of storm protection. The project site is not a source of potable water and would not require any water withdrawals. However, the project would result in the construction of a dune system that would serve as storm protection to the developed uplands, including infrastructure such as water utilities. Therefore, the Corps has determined that the project would have a beneficial effect on water supply conservation concerns.

(15) Water Quality: The effects to water quality were discussed in Section 6.3 of this document. Based on that evaluation, the Corps has determined that the proposed project would have a short-term detrimental effect on water quality.

(16) Energy Needs: The proposed project would require the use of fossil fuels to power the construction equipment. However, the use of fossil fuels to operate the dredge is negligible when compared to the fossil fuels consumed by other entities in the surrounding area and in Glynn County. Therefore, the Corps has determined that the project would have a negligible effect on energy needs.

(17) Safety: The project site is located along the shoreline of Sea Island, within the surf zone of the Atlantic Ocean. The terminal groin would not be located in a navigation channel, but would constitute a potential hazard to small recreational watercraft operating in close proximity to the shoreline. As a potential hazard to navigation, the terminal groin would be subject to USCG approval and marking requirements in accordance with 33 CFR 64. Marking requirements would be determined by the USCG, and once established would be maintained in perpetuity or until the groin is removed. During dredging operations, the pipeline could create an obstruction to navigation. However, the pipeline would be placed on the ocean floor and marked with buoys.

In addition, the Corps would include the following special condition in any proffered permit issued for the proposed project, "That use of the permitted activity must not interfere with the public's right to free navigation in the Atlantic Ocean, a navigable water of the United States." When considering all aspects of

the proposed project, the Corps has determined that the project would have a negligible effect on safety.

(18) Food and Fiber Production: The project review area is not suitable for food and/or fiber production and would not result in a change in land use. Therefore, the Corps has determined that the project would have no effect on food/fiber production.

(19) Mineral Needs: The project site is located along the shoreline of Sea Island, within the surf zone of the Atlantic Ocean. Dredging the offshore borrow site would remove between 1.3-2.5 million CYs of sand from ocean floor. Sand is considered a construction material and is frequently used throughout the surrounding area, state and country. However, it is anticipated that through natural processes (i.e. waves, currents, etc.), the site would be replenished with sand. Therefore, there would be a long-term minor detrimental effect to mineral needs.

(20) Consideration of Property Ownership: The applicant owns the uplands adjacent to the project site. Therefore, the Corps had determined that there would be no effect on property ownership.

(21) Needs and Welfare of the People: The project site is located on Sea Island. Sea Island is a barrier Island that consists of a resort development (i.e. the Sea Island Beach Club) as well as private residential homes. The purpose of the project is to provide storm protection to the developed areas and upland lots. Specifically, the project would result in the reestablishment of the high tide beach and dune systems that have eroded due to natural processes (i.e. storms, sea level rise, etc.) and the hard armoring of the shoreline. Without this renourishment, the beach club and private property owners would be subject to further erosion that could result in a loss in the beach and subsequently reduce property values. Because of the positive economic impact and the fact that any negative impacts are negligible and have been minimized, the Corps has determined that the proposed project would have a negligible effect to the general needs and welfare of the people.

7.1.1 Climate Change. The proposed activities within the Corps federal control and responsibility likely will result in a negligible release of greenhouse gases into the atmosphere when compared to global greenhouse gas emissions. Greenhouse gas emissions have been shown to contribute to climate change. Aquatic resources can be sources and/or sinks of greenhouse gases. For instance, some aquatic resources sequester carbon dioxide whereas others release

methane; therefore, authorized impacts to aquatic resources can result in either an increase or decrease in atmospheric greenhouse gas. These impacts are considered de minimis. Greenhouse gas emissions associated with the Corps federal action may also occur from the combustion of fossil fuels associated with the operation of construction equipment, increases in traffic, etc. The Corps has no authority to regulate emissions that result from the combustion of fossil fuels. These are subject to federal regulations under the Clean Air Act and/or the Corporate Average Fuel Economy (CAFE) Program. Greenhouse gas emissions from the Corps action have been weighed against national goals of energy independence, national security, and economic development and determined not contrary to the public interest.

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

Refer to Section 3.0.

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

Discussion: There were no unresolved conflicts identified as to resource use.

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

Detrimental effects are expected to be minimal and permanent.

Beneficial effects are expected to be minimal and permanent.

8.0 Mitigation(33 CFR 320.4(r), 33 CFR Part 332, 40 CFR 230.70-77, 40 CFR 1508.20 and 40 CFR 1502.14)

8.1 Avoidance and Minimization: When evaluating a proposal including regulated activities in waters of the United States, consideration must be given to avoiding and minimizing effects to those waters. Avoidance and minimization measures are described above in Sections 1 and 3.

Were any other mitigative actions including project modifications discussed with the applicant implemented to minimize adverse project impacts? (see 33 CFR 320.4(r)(1)(i)) Yes

To ensure that the proposed groin is not trapping sand, a special condition has been added that includes requirements to monitor sand movement within the southern groin and proposed new groin as well as downstream of the groins. This monitoring would be accomplished through extensive surveying of the shoreline in these areas both pre and post construction. Should the monitoring/surveying indicate that the new groin is trapping sand, the applicant would be required to submit a corrective action plan (i.e. sand bypass, adjustment/removal of the new groin, etc.). For specific monitoring requirements, refer to section 11.

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

Provide rationale: No impacts are proposed to a special aquatic site nor is it anticipated that the project would result in a loss in function to down drift special aquatic sites (i.e. salt marsh).

9.0 Consideration of Cumulative Impacts

(40 CFR 230.11(g) and 40 CFR 1508.7, RGL 84-9) Cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor direct and indirect but collectively significant actions taking place over a period of time. A cumulative effects assessment should consider how the direct and indirect environmental effects caused by the proposed activity requiring DA authorization (i.e., the incremental impact of the action) contribute to cumulative effects, and whether that incremental contribution is significant or not. .

9.1 Identify/describe the direct and indirect effects caused by the proposed activity:

Direct effects of the project consist of the excavation and mortality of ~250 acres of surficial benthic organisms in the borrow area. Filling operations will bury up to 200 acres of willow beach and inshore habitat (ocean shoreline), resulting in mortality and displacement of existing benthic populations. Nourishment will create an additional ~90 acres of dry sand beach before full profile equilibration (habitat for turtle nesting, shorebird roosting, and recreational area).

The groin could result in sand being trapped between the southern groin and the new groin and thus not migrating to the down drift shorelines (i.e. the Spit, East

Beach and St. Simon's Island). As proposed, the groin would extend 350' into the Atlantic Ocean with a variable crest height of 3-6'. The low profile would allow sand to pass over and around the structure. In addition, the groin would be constructed of two feet-diameter granite armor stone; with a core component of smaller diameter stone. The use of the armor stone would allow for a large void ratio, thus providing the "leaky" characteristic that allows sand to pass through the structure. To prevent settlement of the stone, and if necessary to facilitate modification or removal of the groin, a base layer of geo-textile matting (one-foot thick) would be installed below grade prior to armor stone placement.

During the evaluation of the application, Savannah District solicited Mr. Kevin Conner, a coastal engineer in the Wilmington District, to complete an independent review of the report by Oertel and Basco in conjunction with the following reports provided by the public: (1) *Impacts to Sea Island's Sand-Sharing System and Alternative Shore Protection Methods*, prepared by Bret M. Webb, Ph.D., P.E., D.CE; and (2) *Summary of Historical Shoreline Change for the Sea Island, Georgia's South Groin Region, 1869 to 2013*, prepared by Chester W. Jackson, Jr., Ph.D. These reports documented the history of shoreline change on Sea Island and the potential for the project to result in erosion of downdrift shorelines.

Mr. Conner's review concluded that the existing T-head groins are currently trapping some of the material (sand, silt, clay, etc.) that is naturally coming from the north, and moving south. The southern end of the spit is currently eroding and would continue to erode as long as the existing groin system remains in place. Therefore, regardless of whether the new proposed groin is constructed, the existing hard armoring (which has been in place to some extent since the 1980's) would continue to contribute to the erosion of the spit. Furthermore, the area between the southern groin and proposed new groin represents only an 8 percent increase, when compared to the area currently between the northern and southern groins. According to Mr. Conner, it is unlikely that the construction of a new shorter groin just south of the existing southern groin would interrupt sediment transport in any measurable way under the current system. Mr. Conner recommended that the construction of the groin be accompanied by the planned fill placement that is currently proposed as well as the inclusion of a monitoring plan.

Any draft permit issued for the proposed project would include requirements to monitor sand movement within the southern groin and proposed new groin as well as downdrift of the groins. This monitoring would be accomplished through extensive surveying of the shoreline in these areas both pre and post construction. Should the monitoring/surveying indicate that the new groin is

trapping sand, the applicant would be required to submit a corrective action plan (i.e. sand bypass, adjustment/removal of the new groin, etc.). For specific monitoring requirements, refer to section 11.

9.2 The geographic scope for the cumulative effects assessment is:

The geographic scope for this assessment encompasses the entire shoreline of Sea Island, portions of Gould's Inlet and the Hampton River, and portions of the adjacent island of St. Simon's Island (including East Beach) that may be affected by the proposed action, and the ocean waters and seafloor offshore of Sea Island that comprise the proposed borrow site.

9.3 The temporal scope of this assessment covers: According to the applicant, shoreline retreat has been occurring at varying rates along the Sea Island shoreline since at least 1860 and has undergone numerous cycles of erosion and accretion. By the 1970's, the waves were eroding property along the shoreline and property owners began hard armoring the shoreline through the placement of rock and/or concrete revetments. By the mid 1980's revetments armored approximately 3 miles of the Sea Island shoreline. According to the applicant, the revetments halted the shoreline retreat but the beach continued to erode and by the late 1980's there was no high tide beach for many areas of the Sea Island shoreline. As a result, three beach renourishment events were conducted between 1986-1997 and in the early 1990's two t-head groins were constructed to retain the nourishment volume on Sea Island. Given the above, the Corps has determined that the temporal scope for this assessment is from 1980 (i.e. beginning of hard armoring) to 2023 (i.e. the life of the permit).

9.4 Describe the affected environment: The project site is located within the surf zone of the Atlantic Ocean, along the Sea Island shoreline, in Glynn County, Georgia (Latitude: 31.1833, Longitude: 81.3310). A proposed 255-acre sand borrow area is located in the Atlantic Ocean, approximately 4 miles east/southeast of the Sea Island project area. Sea Island is an approximately 5-mile long barrier island that is separated from Little St. Simon's Island to the north by the Hampton River and from St. Simon's Island to the west and south by Village Creek, the Black Banks River and Gould's Inlet. Approximately 3 miles of the shoreline has been hard armored with revetments and/or sea walls. In addition, two t-head groins and a breakwater are located along the shoreline. Based on google earth imagery, the northern groin is approximately 600 feet in length whereas the southern groin extends 500 feet.

The surf zone, which includes subtidal and intertidal areas, generally includes the area from the point at which waves are cresting off a beach to the highest point at which a wave washes on shore.

9.5 Determine the environmental consequences: The Corps has identified the following resources of concern that the project may impact: (1) water quality; (2) aquatic species and wildlife (to include threatened and endangered species) and (3) the sand sharing system. These resources are important resources that could be cumulatively affected by the proposed activity. The following is an assessment of the potential impacts of the proposed project on these resources.

(1) Water Quality: Direct and indirect effects of the project on aquatic organisms and wildlife are discussed above in Sections 6 and 7. The re-suspension of sediments (i.e. plumes) during dredging at the offshore borrow site could result in minor, temporary adverse impacts to turbidity, total suspended solids and dissolved oxygen in the water column within the excavation site. However, these effects are typically short-term and localized when the dredged material is composed of relatively clean sand with a minimal fine silt/clay fraction. As discussed above, all potential beach fill deposits from the borrow site are composed of highly compatible sands. Therefore, it is anticipated that the effects of dredging-induced sediment suspension on water quality would be short-term and localized.

In addition to potential effects at the borrow site, sand placement operations would produce temporary increases in suspended sediment concentrations and turbidity. However, turbidity increases are typically confined to the surf zone in the immediate vicinity of the slurry discharge point. Furthermore, it is anticipated that the use of compatible beach fill with minimal fines and the use of temporary dikes to contain the discharged sand slurry would reduce the extent of sediment suspension. Therefore, it is anticipated that sediment suspension effects attributable to sand placement would also be short-term and localized.

By letter dated June 8, 2018, the Georgia Department of Natural Resources, Environmental Protection Division issued the 401 Water Quality Certification for the project. Based on the short-term and localized nature of the anticipated sediment suspension effects, the project would have a short-term minor effect on water quality and would not result in adverse cumulative effects to water quality.

Based on the short-term, localized effects, the Corps has determined that the project would have a minimal individual and cumulative adverse impacts on water quality.

(2) Aquatic organisms and wildlife: Direct and indirect effects of the project on aquatic organisms and wildlife are discussed above in Sections 6 and 7. Cumulatively (i.e. in conjunction with the hard armoring and existing groins), the project could exacerbate the ongoing erosion of the Spit and trap sand that would otherwise travel to downdrift shorelines. Continued erosion of the spit would result in reduced habitat for aquatic organisms and wildlife currently utilizing the area, including threatened and endangered species and critical habitat. However, as stated above, it is unlikely that the construction of a new shorter groin just south of the existing southern groin would interrupt sediment transport in any measurable way under the current system. Mr. Conner recommended that the construction of the groin be accompanied by the planned fill placement that is currently proposed as well as the inclusion of a monitoring plan.

Any draft permit issued for the proposed project would include requirements to monitor sand movement within the southern groin and proposed new groin as well as downdrift of the groins. This monitoring would be accomplished through extensive surveying of the shoreline in these areas both pre and post construction. Should the monitoring/surveying indicate that the new groin is trapping sand, the applicant would be required to submit a corrective action plan (i.e. sand bypass, adjustment/removal of the new groin, etc.). For specific monitoring requirements, refer to section 11.

(3) Sand sharing system: The groin could result in sand being trapped between the southern groin and the new groin and thus not migrating to the down drift shorelines (i.e. the Spit, East Beach and St. Simon's Island). As proposed, the groin would extend 350' into the Atlantic Ocean with a variable crest height of 3-6'. This low profile, would allow sand to pass over and around the structure. In addition, the groin would be constructed of two feet-diameter granite armor stone; with a core component of smaller diameter stone. The use of the armor stone would allow for a large void ratio, thus providing the "leaky" characteristic that allows sand to pass through the structure. To prevent settlement of the stone, and if necessary to facilitate modification or removal of the groin, a base layer of geo-textile matting (one-foot thick) would be installed below grade prior to armor stone placement.

During the evaluation of the application, Savannah District solicited Mr. Kevin Conner, a coastal engineer in the Wilmington District, to complete an independent review of the report by Oertel and Basco in conjunction with the following reports provided by the public: (1) *Impacts to Sea Island's Sand-Sharing System and Alternative Shore Protection Methods*, prepared by Bret M. Webb, Ph.D., P.E., D.CE; and (2) *Summary of Historical Shoreline Change for the Sea Island, Georgia's South Groin Region, 1869 to 2013*, prepared by

Chester W. Jackson, Jr., Ph.D. These reports documented the history of shoreline change on Sea Island and the potential for the project to result in erosion of downdrift shorelines.

Mr. Conner's review concluded that the existing T-head groins are currently trapping some of the material (sand, silt, clay, etc.) that is naturally coming from the north, and moving south. The southern end of the spit is currently eroding and would continue to erode as long as the existing groin system remains in place. Therefore, regardless of whether the new proposed groin is constructed, the existing hard armoring (which has been in place to some extent since the 1980's) would continue to contribute to the erosion of the spit. Furthermore, the area between the southern groin and proposed new groin represents only an 8 percent increase, when compared to the area currently between the northern and southern groins. According to Mr. Conner, it is unlikely that the construction of a new shorter groin just south of the existing southern groin would interrupt sediment transport in any measurable way under the current system. Mr. Conner recommended that the construction of the groin be accompanied by the planned fill placement that is currently proposed as well as the inclusion of a monitoring plan.

In addition, the groin field would be backfilled with 1.3-2.5 million CYs of sand from an offshore source. Therefore, the project would introduce between 1.3-2.5 million CYs of sand from an offshore source into the groin field, and subsequently supplement the sand sharing system. It is likely that the introduction of this additional sand would allow the beach between the groins to eventually reach an equilibrium state and thus allow some sand to bypass the groins and travel downdrift to the spit and potentially to St. Simon's Island, including East Beach.

Any draft permit issued for the proposed project would include requirements to monitor sand movement within the southern groin and proposed new groin as well as downdrift of the groins. This monitoring would be accomplished through extensive surveying of the shoreline in these areas both pre and post construction. Should the monitoring/surveying indicate that the new groin is trapping sand, the applicant would be required to submit a corrective action plan (i.e. sand bypass, adjustment/removal of the new groin, etc.). For specific monitoring requirements, refer to section 11.

Based on the design of the project and proposed special condition, the Corps has determined that the project would have a minimal individual and cumulative adverse impacts on the sand sharing system.

9.6 Discuss any mitigation to avoid, minimize or compensate for cumulative effects:

As proposed, the groin would extend 350' into the Atlantic Ocean with a variable crest height of 3-6'. This low profile, would allow sand to pass over and around the structure. In addition, the groin would be constructed of two feet-diameter granite armor stone; with a core component of smaller diameter stone. The use of the armor stone would allow for a large void ratio, thus providing the "leaky" characteristic that allows sand to pass through the structure. To prevent settlement of the stone, and if necessary to facilitate modification or removal of the groin, a base layer of geo-textile matting (one-foot thick) would be installed below grade prior to armor stone placement.

In addition, the groin field would be backfilled with 1.3-2.5 million CYs of sand from an offshore source. Therefore, the project would introduce between 1.3-2.5 million CYs of sand from an offshore source into the groin field, and subsequently supplement the sand sharing system. It is likely that the introduction of this additional sand would allow the beach between the groins to eventually reach an equilibrium state and thus allow some sand to bypass the groins and travel downdrift to the spit and potentially to St. Simon's Island, including East Beach.

Therefore, given the design of the groin and the proposed renourishment, sand migrating past should bypass the structure and continue onto the downdrift shorelines.

Any draft permit issued for the proposed project would include requirements to monitor sand movement within the southern groin and proposed new groin as well as downdrift of the groins. This monitoring would be accomplished through extensive surveying of the shoreline in these areas both pre and post construction. Should the monitoring/surveying indicate that the new groin is trapping sand, the applicant would be required to submit a corrective action plan (i.e. sand bypass, adjustment/removal of the new groin, etc.). For specific monitoring requirements, refer to section 11.

9.7 Conclusions regarding cumulative impacts:

When considering the overall impacts that will result from the proposed activity, in relation to the overall impacts from past, present, and reasonably foreseeable future activities, the incremental contribution of the proposed activity to cumulative impacts in the area described in section 9.2, are not considered to be significant . Compensatory mitigation will not be required to help offset the impacts to eliminate or minimize the proposed activity's incremental contribution

to cumulative effects within the geographic area described in Section 9.2. Mitigation required for the proposed activity is discussed in Section 8.0.

10.0 Compliance with Other Laws, Policies, and Requirements

10.1 **Section 7(a)(2) of the Endangered Species Act (ESA):** Refer to Section 2.2 for description of the Corps action area for Section 7.

10.1.1 Has another federal agency been identified as the lead agency for complying with Section 7 of the ESA with the Corps designated as a cooperating agency and has that consultation been completed? No

10.1.3 Are there listed species or designated critical habitat present or in the vicinity of the Corps' action area? Yes

Effect determination(s), including no effect, for all known species/habitat, and basis for determination(s): The Corps has determined that the proposed project may affect, but is not likely to adversely affect the following species: Green sea turtle (*Chelonia mydas*), Hawksbill sea turtle (*Eretmochelys imbricata*), Leatherback sea turtle (*Dermochelys coriacea*), Loggerhead sea turtle (*Caretta caretta*), Kemp's Ridley sea turtle (*Lepidochelys kempii*); Piping Plover (*Charadrius melodus*), Red knot (*Calidris canutus rufa*), Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*), Shortnose Sturgeon (*Acipenser brevirostrum*), West Indian Manatee (*Trichechus manatus*), and the North Atlantic Right Whale (*Eubalaena glacialis*). In addition, the Corps has determined that the proposed project would not result in an adverse modification to North Atlantic right whale critical habitat.

By letter dated May 22, 2018, the USFWS concurred with the above effects determination regarding the species under their purview. By letter dated October 19, 2017, the NMFS, PRD concurred with the above effects determination regarding the species under their purview. In addition, the Corps has determined that the dredging of sand and its subsequent placement onto the beach is covered under the SARBA/SARBO. For the complete evaluation of potential effects to threatened and endangered species and critical habitat, refer to Section 6.4.1 above.

10.1.3 Consultation with either the National Marine Fisheries Service and/or the U.S. Fish and Wildlife Service was initiated and completed as required, for any determinations other than "no effect" (see the attached ORM2 Summary sheet for begin date, end date and closure method of the consultation). Based on a review of the above information, the Corps has determined that it has fulfilled its

responsibilities under Section 7(a)(2) of the ESA. The documentation of the consultation is incorporated by reference.

10.2 **Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), Essential Fish Habitat (EFH).**

10.2.1 Has another federal agency been identified as the lead agency for complying with the EFH provisions of the Magnuson-Stevens Act with the Corps designated as a cooperating agency and has that consultation been completed? No

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

10.2.3 If yes, EFH species or complexes considered: The South Atlantic Fishery Management Council (SAFMC) identifies the sub-tidal and intertidal non-vegetated flats (unconsolidated bottom), surf zones, and coastal inlets as EFH for several species, including penaeid shrimp, snapper-grouper complex, coastal migratory pelagics and highly migratory species. In addition to serving as EFH, these areas provide habitat for numerous species and their prey that have commercial or recreational importance, including red drum (*Sciaenops ocellatus*), southern flounder (*Paralichthys lethostigma*), Florida pompano (*Trachinotus carolinus*), summer flounder (*Paralichthys entatus*), spot (*Leiostomus xanthurus*), and blue crab (*Callinectes sapidus*).

Effect(s) determination and basis for that determination(s): As stated above, impacts to aquatic organisms would be short term and localized to the project area. Based on the EFH assessment submitted by the applicant, the Corps determined that the project would have a minimal adverse effect to EFH. Impacts to aquatic organisms (including these species) are discussed above in Sections 6 and 7.

By letter dated April 20, 2018, the NMFS, HCD, provided the following conservation recommendations (CRs): "(1) The T-head groin portion of the proposed action should not be permitted and (2) To the extent practicable, work should be limited to seasonal periods of low biological activity. For optimal minimization of impacts to intertidal organisms, deposition of beach fill should be limited to the months of December through April." On July 17, 2018, the Corps responded to the above letter, stating that based on available information, the small proposed increase in the groin field is not expected to more than minimally exacerbate ongoing erosion of the spit. Therefore, the Corps was not going to incorporate CR one in the permit.

However, regarding CR 2, the Corps would include a special condition in any draft permit requiring that all work be conducted outside of sea turtle nesting season (May 1-October 31) to the maximum extent practicable. In addition, prior to any work during sea turtle nesting season, the applicant must obtain written

approval from the Georgia Department of Natural Resources, Wildlife Resources Division, the U.S. Fish and Wildlife Service, and the Corps. With the inclusion of the above special conditions, the majority of the work would be limited to seasons of low biological activity (i.e. December through April).

By letter dated July 27, 2018, the NMFS, HCD stated they would not elevate the decision and that the Savannah District has complied with section 305(b)(4)(B) of the Magnuson-Stevens Act and 50 CFR 600.920(k)(1).

10.2.4 Consultation with the National Marine Fisheries Service was initiated and completed as required (see the attached ORM2 Summary sheet for consultation type, begin date, end date and closure method of the consultation). Based on a review of the above information, the Corps has determined that it has fulfilled its responsibilities under EFH provisions of the Magnuson-Stevens Act.

10.3 **Section 106 of the National Historic Preservation Act (Section 106):** Refer to Section 2.3 for permit area determination.

10.3.1 Has another federal agency been identified as the lead federal agency for complying with Section 106 of the National Historic Preservation Act with the Corps designated as a cooperating agency and has that consultation been completed? No.

10.3.2 Known historic properties present? No.

Effect determination and basis for that determination: During previous permit evaluations, the Corps determined that there were no cultural resource sites located within the surf zone where the sand would be placed. The beach between the existing groins has been repeatedly renourished since the Mid-1980s. In addition, the applicant performed an underwater survey of the offshore borrow site. Based on results of this survey, the Corps determined that the proposed project would have no adverse effect on cultural resources or historic properties. By letter dated July 6, 2018, the Georgia Department of Natural Resources, State Historic Preservation Department concurred with the above effects determination.

10.3.3 Consultation was initiated and completed with the appropriate agencies, tribes and/or other parties for any determinations other than "no potential to cause effects" (see the attached ORM2 Summary sheet for consultation type, begin date, end date and closure method of the consultation). Based on a review of the information above, the Corps has determined that it has fulfilled its responsibilities under Section 106 of the NHPA. Compliance documentation incorporated by reference.

10.4 Tribal Trust Responsibilities

10.4.1 Was government-to-government consultation conducted with Federally-recognized Tribe(s)?No

Provide a description of any consultation (s) conducted including results and how concerns were addressed. The Corps has determined that it has fulfilled its tribal trust responsibilities.

10.4.2 Other Tribal including any discussion of Tribal Treaty rights? N/A

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

10.5.1 Is a Section 401 WQC required, and if so, has the certification been issued, waived or presumed? An individual water quality certification is required and has been issued by the certifying agency.

By letter dated June 8, 2018, the Georgia EPD issued the state water quality certification for the proposed project.

10.6 Coastal Zone Management Act (CZMA)

10.6.1 Is a CZMA consistency concurrence required, and if so, has the concurrence been issued, waived or presumed? An individual CZMA consistency concurrence is required and has been issued by the appropriate agency. By letters dated March 25, 2017, and July 13, 2018, the Georgia CRD issued the CZMA consistency concurrences for the proposed project.

10.7 Wild and Scenic Rivers Act

10.7.1 Is the project located in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system? No
The Corps has determined that it has fulfilled its responsibilities under the Wild and Scenic Rivers Act.

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

10.8.1 Does the applicant also require permission under Section 14 of the Rivers and Harbors Act (33 USC 408) because the activity, in whole or in part, would alter, occupy or use a Corps Civil Works project? No, there are no federal projects in or near the vicinity of the proposal.

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

10.9.1 Does the project propose to impact wetlands? No

10.9.2 Based on the public interest review herein, the beneficial effects of the project outweigh the detrimental impacts of the project.

11.0 Special Conditions

11.1 Are special conditions required to protect the public interest, ensure effects are not significant and/or ensure compliance of the activity with any of the laws above? Yes

11.3 Required special condition(s)

Special condition(s):

(1) To ensure that the project would not adversely affect any threatened and endangered species, the Permittee shall comply with the following special conditions:

a. All work shall be completed outside of the prescribed sea turtle nesting season (i.e. construction between November 1st and April 30th).

b. Following construction, the Permittee shall cross-till the project from the high tide wave rush to the seaward toe of the constructed dune feature. The dune feature should also be tested for compaction prior to the planting of vegetation or sand fence construction. If compaction readings are greater than 500 CPU at any of the test depths (6 inches, 12 inches, 18 inches) for two consecutive stations, the dune feature will be tilled.

c. Annual surveys for compaction will be completed in February for 5 years following completion of the project. Sand compaction should be measured at a maximum of 500 foot intervals along the fill area. Compaction will be measured at 3 stations along three transects corresponding to the landward, middle and seaward portion of the fill berm. An additional measurement should be taken from the dune feature. At each measurement station, a cone penetrometer will be pushed to depths of 6, 12, and 18 inches three times (3 replicates) and the compaction readings will be averaged to produce a final reading at each depth for each station. If the average value for any depth exceeds 500 CPU for any 2 or more adjacent stations (including the dune feature), that area will be tilled prior to May 1. Tilling will be completed to a depth of 36 inches. A representative from Georgia DR shall be present during the compaction testing (contact: Mark Dodd, 912-264-7218).

d. An annual summary of compaction surveys and the actions taken will be submitted to the Corps. A report on the results of compaction monitoring will be submitted to the Corps prior to any tilling actions being taken. This condition will be evaluated annually and may be modified if necessary to address sand compaction problems identified during the previous year.

e. Visual surveys for escarpments along the beach fill area will be made after construction and completed in February for five years following completion of the project. Escarpments in excess of 18 inches extending more than 100 feet will be mechanically leveled to natural beach contour prior to April 1st.

f. Visual surveys for escarpments along the beach fill area will be made weekly, and after storm events, from April 1st through October 31st. Escarpments that interfere with marine turtle nesting or that exceed 18 inches in height for a distance of 100 feet or more will be graded to the natural beach contour with guidance from the Georgia Department of Natural Resources and the U.S. Fish and Wildlife Service.

g. The Permittee shall participate in the Right Whale Early Warning System. Dredging within right whale critical habitat from December through March must follow the protocol established within the Early Warning System.

h. Full-time NMFS-certified endangered species observer(s) shall be present on the dredge to document visible sea turtle activity, monitor any sea turtle takes, and watch for and alert the dredge operator of manatees or whales (especially right whales or humpbacks) in the area.

i. All project personnel shall follow NMFS marine mammal stranding report procedures.

j. The Permittee shall comply with the "Savannah District Standard Manatee Special Conditions for Aquatic Construction." (Enclosed).

k. The Permittee shall utilize one of the following materials to secure the buoy to the pipeline: (1) Light weight chain; (2) Non-looping wire rope; or (3) Plastic sheathing around nylon rope to prevent looping.

(2) To ensure that unsuitable material is not placed onto the beach, the Permittee shall comply with the following special conditions:

a. Prior to any placement of beach fill, the Permittee shall construct temporary sand training dikes on the beach. The slurry from the offshore borrow site shall be pumped behind the sand training dike and the sand shall be allowed to dewater prior to placement on the beach.

b. While the material is being pumped into the dewatering area (i.e. behind the sand training dike), the Permittee shall have qualified personnel under the direction of a Georgia-registered professional engineer or a professional geologist monitoring the slurry discharge and correlating it with the borrow area conditions. Specifically, personnel shall monitor the slurry discharge as well as the dewatering area to determine whether the discharge/sand contains unsuitable material (i.e. clay balls, mud rollers, etc.)

c. During construction of the beach fill, samples of the beach fill will be obtained at 200 foot intervals and compared to the native and borrow area samples. Samples will be taken along one shore-perpendicular transect and will be combined into one physical composite and sent to the laboratory for grain-size analysis. Samples will be analyzed as soon as possible but not more than five (5) days after collection. Sediment test results will be submitted monthly to the USFWS and GADNR for review.

d. Upon completion of construction, the Permittee shall resample the project area and obtain representative samples of the beach fill using the same stations as the pre-project samples. Results will be compared with pre-project beach samples and borrow area sediment test results. Data will be submitted to the USFWS and GADNR in a comprehensive final report.

e. The Permittee shall immediately (i.e. within 24 hours) notify the Corps, GADNR and USFWS if non-compatible material is encountered in the borrow area. The dredge will be relocated to other subareas within the permitted borrow area if the following conditions are encountered:

1. Evidence of high concentrations of mud persisting for more than 30 minutes in the slurry based on visual observation at the discharge pipe and monitoring of specific gravity of the slurry at the dredge.

2. Evidence of high concentrations of non-shell gravel such as chunks of limestone, marl, or similar cemented sediments which persist for more than 30 minutes in the slurry based on visual observation at the discharge pipe and monitoring of specific gravity of the slurry at the dredge.

3. Evidence of high concentrations of coarse shell material exceeding pebble-sized clasts (i.e. oyster shells, quahogs, etc.) which persist for more than 30 minutes in the slurry, based on visual observations at the discharge pipe and monitoring of specific gravity of the slurry at the dredge.

g. Because of the lag time between excavations in the borrow area and pump-out onto the beach, accumulations of mud rollers and coarse gravel material may occur before the dredge can be relocated. If such accumulations exceed the equivalent of one 15 cubic yard dump truck per 100 linear feet of

beach, the Permittee shall pick up the coarse material using hand labor or a beach-sweeping device as soon as practicable upon completion of the section or upon completion of the project. To the extent practicable, such accumulations will be raked into stockpiles above the high-tide line.

(3) Prior to any maintenance/sand recycling event, the Permittee shall sample the proposed borrow area to ensure the borrow site has the required amount of beach quality sand to complete the event. The samples should be taken as individual cores and be an adequate amount to represent the borrow area.

(4) The Permittee shall perform beach profile surveys. The surveys shall establish a fixed, repeatable baseline along the shore with perpendicular transects extending 2,400 feet south and 1,200 feet north of the new groin, with stations and transects at 100-foot intervals. Data points shall be surveyed along the above transects to a water depth of 6 feet.

(5) The beach profile surveys shall be performed at the following times: (a) pre-construction; (b) post-construction; (c) 6 months, 1 year, 2 years, 3 years, 4 years, and 5 years after the post-construction survey; and (d) more frequently after storm events, if warranted.

(6) The preconstruction (baseline) survey shall be performed between 7-30 days prior to the start of construction. The preconstruction survey data and drawings shall be submitted to the Corps in a preliminary report within 20 days after the field work is complete, with a final report to be submitted no later than 120 days after the field work for the survey is completed.

(7) Monitoring surveys shall be completed between January 1st-March 31st. Preliminary results will be submitted within 20 days, with final monitoring reports submitted no later than 60 days after the field work for the survey is completed.

(8) Monitoring reports shall include at a minimum the following and along with any other information provided by the applicant will be used to determine if sand-bypassing or other corrective action is required:

a. The transects and survey data shall be plotted on a plan view drawing (or multiple drawings) of the entire survey area. Drawings must be clearly legible on 8.5" x 11" paper and include a scale bar and north arrow.

b. All elevation data shall be reported relative to the NAVD88.

c. The Permittee shall provide a table detailing the data obtained from each sample point along each transect. This data shall be compared to the initial post-construction survey data at each transect.

d. The Permittee shall provide verifiable estimates of the net change in sand volume at each transect, and within the survey area as a whole. The net change in sand volume shall be calculated as the difference between the volume obtained in the initial post-construction survey and subsequent volumes documented in surveys at the required intervals specified in Special Condition (5). The Corps will evaluate the Permittees' volume estimates and determine if a corrective action plan is required.

e. Should the Corps determine that the groin is causing negative impacts to the sand-sharing system, the Permittee shall submit a corrective action plan (i.e. sand bypass, adjustment/removal of the new groin, etc.) to the Corps and GADNR for review and approval.

f. Existing site conditions shall be photographed during each survey. Photographs shall be plotted on a photo location map, including the location and direction of each photograph. Photographs shall be representative of the entire survey area and shall be taken at the same approximate location during each survey.

(9) All work will be performed in accordance with the following attached plans and drawings which are incorporated in and made part of the permit:

a. Vicinity Map, dated March 2, 2018.

b. Project Plan, Reach A, Sta 95+00 to 135+00 Map, dated March 2, 2018.

c. Project Plan, Reach B, Sta 135+00 to 180+00 Map, dated March 2, 2018.

d. Project Plan, Reach B, Sta 180+00 to 225+00 Map, dated March 2, 2018.

e. Project Plan, Reach C, Sta 225+00 to 260+00 Map, dated March 2, 2018.

f. Proposed Fill Sections, Sta 110+00 to 140+00 Map, dated March 2, 2018.

g. Proposed Fill Sections, Sta 150+00 to 180+00 Map, dated March 2, 2018.

h. Proposed Fill Sections, Sta 190+00 to 220+00 Map, dated March 2, 2018.

i. Proposed Fill Sections, Sta 230+00 to 240+00 Map, dated March 2, 2018.

j. Area Bathymetry, NOAA Map 11502, dated March 2, 2018.

k. Borrow Area Bathymetry & Geotechnical Data, dated March 2, 2018.

l. Proposed Borrow Area Excavation Sections, dated March 2, 2018.

m. Geotechnical Data Grain Size Distributions, dated March 2, 2018.

n. Reserve at Sea Island, Beach Renourishment & Groin, Sheets 1-13 dated September 10, 2015.

Rationale: special condition 1 is included to ensure that the project would not adversely affect any threatened and endangered species; special conditions 2 and are included to ensure that unsuitable material is not placed onto the beach, and special conditions 4-9 are included to ensure the project does not trap sand from migrating downdrift.

12.0 Findings and Determinations

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

12.2 Presidential Executive Orders (EO):

12.2.1 EO 13175, Consultation with Indian Tribes, Alaska Natives, and Native Hawaiians: This action has no substantial effect on one or more Indian tribes, Alaska or Hawaiian natives.

12.2.2 EO 11988, Floodplain Management: Alternatives to location within the floodplain, minimization and compensatory mitigation of the effects were considered above.

12.2.3 EO 12898, Environmental Justice: The Corps has determined that the proposed project would not use methods or practices that discriminate on the basis of race,

color or national origin nor would it have a disproportionate effect on minority or low-income communities.

12.2.4 EO 13112, Invasive Species: There are no invasive species issues involved in this proposed project.

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

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

12.4 Compliance with the Section 404(b)(1) Guidelines: Having completed the evaluation above, I have determined that the proposed discharge complies with the Guidelines.

12.5 Public interest determination: Having reviewed and considered the information above, I find that the proposed project is not contrary to the public interest.

PREPARED BY:

Sarah E. Wise
Team Lead, Coastal Section

Date: 9/6/18

REVIEWED BY:

Kimberly L. Garvey
Chief, Management Section

Date: 9/6/2018

REVIEWED BY:

John Ballard
Office of Counsel

Date: 6 SEP 18

APPROVED BY:

Tunis McElwain
Acting Chief, Regulatory Branch

Date: 6 SEP 2018

History of Corps authorizations associated with beach renourishment activities along the Sea Island beach.

1) 1986, November 4 — Department of the Army Permit No. **074-OYN-005885** from USACE to dredge 144,000 cubic yards of materials from Black Banks River for beach nourishment. *Expired November 4, 1989.*

2) 1990, January 8 — Department of the Army permit No. **074-0YN-007135** to Sea Island Company for beach nourishment at Sea Island beach; includes dredging 2,000,000 cubic yards from Hampton Bay for construction of a sand berm, and construction of terminal groins to improve project performance, for completion by January 31, 1993. Includes various special conditions related to native biota. *Expired January 31, 1993.*

3) 1990, March 20 — Modification of Permit No. **074-0YN-007135** to dredge materials to a depth of -30 Mean Low Water (MLW) adjacent to Pelican Spit and to extend the dredge period to April 30, 1990.

4) 1990, August 8 — Modification of Permit No. **074-0YN-007135** to remove time restrictions on construction of groins and extend groin length.

5) 1990, November 9 — Modification of Permit No. **074-0YN-007135** to extend both south and north groin length.

6) 1992, August 18 — Modification of Permit No. **074-0YN-007135** to excavate ~90,000 cubic yards of sand from north side of south groin to spread along the beach between 22nd Street and 31st Street.

7) 1993, January 3 — Modification of Permit No. **074-0YN-007135** to extend the time period for project completion. *Expired January 31, 1998.*

8) 1993, December 27 — Modification of Permit No **074-0YN-007135** recycle 100,000 cubic yards of sand from south groin area to the beach in the 25th to 31st Street zone, except during loggerhead sea turtle nesting and hatching season.

9) 1995, January 10 — Modification of Permit No. **074-0YN-007135** to recycle ~100,000 cubic yards of sand from the south groin area to the beach in the 23rd Street through 31st Street zone, except during sea turtle nesting season.

10) 1995, August 9 — Department of the Army Permit No. **940011040** to Sea Island Company for beach nourishment between the existing north groin and 36th Street (utilizing ~500,000 cubic yards of sand and construction of a berm and snow fencing to create a dune system). Also includes modification of the existing north groin, adding 38 Campbell modules adding 200' to the end of the groin. Includes various special conditions related to native biota. Attached is Loggerhead Turtle Recovery Plan, date December 1994. *Expired September 30, 1998.*

11) 1995, August 31 — Department of the Army Permit No. **940011041** to Sea Island Company to modify northern groin and nourish a segment of the beach (permit not on file)

12) 1995, September 11 — Letter from USACE to Sea Island Company with enclosed draft permit No. **940013810** for construction of a breakwater structure 200' northeast of the existing south groin parallel to the shore.

13) 1996, January 26 — Modification of Permit No. **074-0YN-007135** to recycle ~100,000 cubic yards of sand from the south groin area to the beach in the 23rd Street through 31st Street zone, except during sea turtle nesting season.

14) 1997, March 27 — Modification of Permit No. **940011041** to extend nourishment from 36th Street to 31st Street.

15) 1997, April 11 — Modification of Permit No. **940011040** to extend sand borrow pit area to include a 750' X 1,000' area immediately south of primary borrow area.

16) 1997, September 2 — Modification of Permit No. **940011040** to move the "T" head on the existing north groin to the south end of the groin extension.

17) 2004, July 9 — Department of Army Permit No. **200405510** permitting placement and maintenance of riprap along an existing bulkhead pursuant to **Nationwide Permit No. 3**. *Expired March 18, 2007.*

18) 2010, August 5 — Extension and modification of Department of Army Permit **SAS-2000-03080** to excavate and recycle 150,000 cubic yards of sand from north and south groin catchment areas, transporting sand to beach between 20th and 36th Street. *Expires June 30, 2015.*