



**The Town of Hilton Head Island
Special Public Facilities Committee Meeting**

Tuesday, October 16, 2012

2:00 p.m.

Benjamin M. Racusin Council Chambers

AGENDA

As a Courtesy to Others Please Turn Off All Cell Phones and Pagers during the Meeting

- 1. Call to Order**
- 2. Freedom of Information Act Compliance**
Public notification of this meeting has been published, posted, and mailed in compliance with the Freedom of Information Act and the Town of Hilton Head Island requirements.
- 3. Committee Business**
- 4. Unfinished Business**
- 5. New Business**
 - Proposed Maintenance Dredging of Sea Pines Waterways
- 6. Adjournment**

Please note that a quorum of Town Council may result if four (4) or more of Town Council members attend this meeting.

MEMORANDUM

TO: Public Facilities Committee

FROM: Scott Liggett, PE, Director Public Projects & Facilities

VIA: Stephen G. Riley, CM, Town Manager

DATE: October 9, 2012

RE: **Proposed Maintenance Dredging of Sea Pines Waterways**

Representatives of the South Island Dredging Association (SIDA) seek the endorsement of Town Council pursuant to a permit application filed jointly with the US Army Corps of Engineers (USACE) and the South Carolina Department of Health and Environmental Control (SDCHEC) regarding the above referenced topic. The attached documents, as provided by SIDA, serve as a summary.

SIDA's sole project presentation to the Town will take place at the Public Facilities Committee meeting. Town Council will consider a Resolution endorsing SIDA's permit application at Council's 4:00 PM regular meeting on October 16, 2012.

The public notice and the application's supporting documents are available for viewing via the USACE – Charleston District website:

<http://www.sac.usace.army.mil/Missions/Regulatory/ProjectsofInterest>

MEMORANDUM

October 9, 2012

TO: Project Facilities Committee

Town of Hilton Head Island

FROM: South Island Dredging Association, Inc.

Overview of Proposed Maintenance Dredging of Sea Pines Waterways

The Project

South Island Dredging Association, Inc. (SIDA) filed on September 7, 2012, a Joint Federal and State Application with the U.S. Army Corps of Engineers to perform maintenance dredging at Harbour Town Marina, Baynard Creek and Braddock Creek, which includes South Beach Marina and other residential docks (the Sea Pines Waterways). A copy of the Application Form is attached as Exhibit A along with a 12-page "Overall Project Description" (Project Description) which identifies at p. 2 each of the scientific studies that was submitted with the Application and a summary of each study. Each of the studies, engineering drawings and other information filed with the Application can be examined in full at the following cite:

<http://www.sac.usace.army.mil/Missions/Regulatory/ProjectsofInterest>.¹

The area planned for maintenance dredging is smaller than permitted in 2001 because the Baynard Creek dredge area will include only the area from the mouth to approximately 375 feet above the Community Docks. This reduces the area by approximately 3400 linear feet. The reduction eliminates impacts to wetland vegetation and oysters.

The following provides a brief overview of certain important elements of the project.

Need to Dredge

The Sea Pines Waterways are in danger of being permanently lost. The silt and sand from Calibogue Sound, which naturally moves through them with the tides, are overtaking them. They are silting in. At low tide some of these waterways are not navigable at all and others only by vessels with minimal drafts. If left alone, world-famous Harbour Town and the other Sea Pines waterways will become unsightly mud flats awash only at high tide. Photos of the Sea Pines Waterways at low tide are attached as Exhibit B.

The Dredge Material Is Clean

The dredge material was tested in 2000, certified by regulatory authorities pursuant to Section 401 of the Clean Water Act for discharge into U.S. Waters and tested again in 2008 with consistent results. The composition of samples taken from the dredge sites is virtually identical to those taken from the sediments of Calibogue Sound.

¹ Regulators will review and comment on the submissions so the details of the project are subject to change.

There is nothing in the dredge material that would harm marine life or the estuary, which is consistent with the absence of industrial or highly urbanized developments in the area. See Project Description p. 4.

Inland Open Water Disposal Is The Only Disposal Alternative

For more than a decade experts in the field and more recently a special task force organized by Sea Pines' Community Services Associates have examined the alternatives for disposal of this dredge material. They have concluded that (i) there is no land based disposal site available for these Sea Pines waterways and (ii) trying to haul hydraulically dredged material to an off shore disposal site is not practicable or feasible, (iii) mechanical dredging with disposal at an off shore site is not practicable or feasible, and (iv) inland open water disposal (IOWD) is the only practicable and feasible alternative to maintain navigability of these creeks and marinas. See Project Description pp. 5-6.

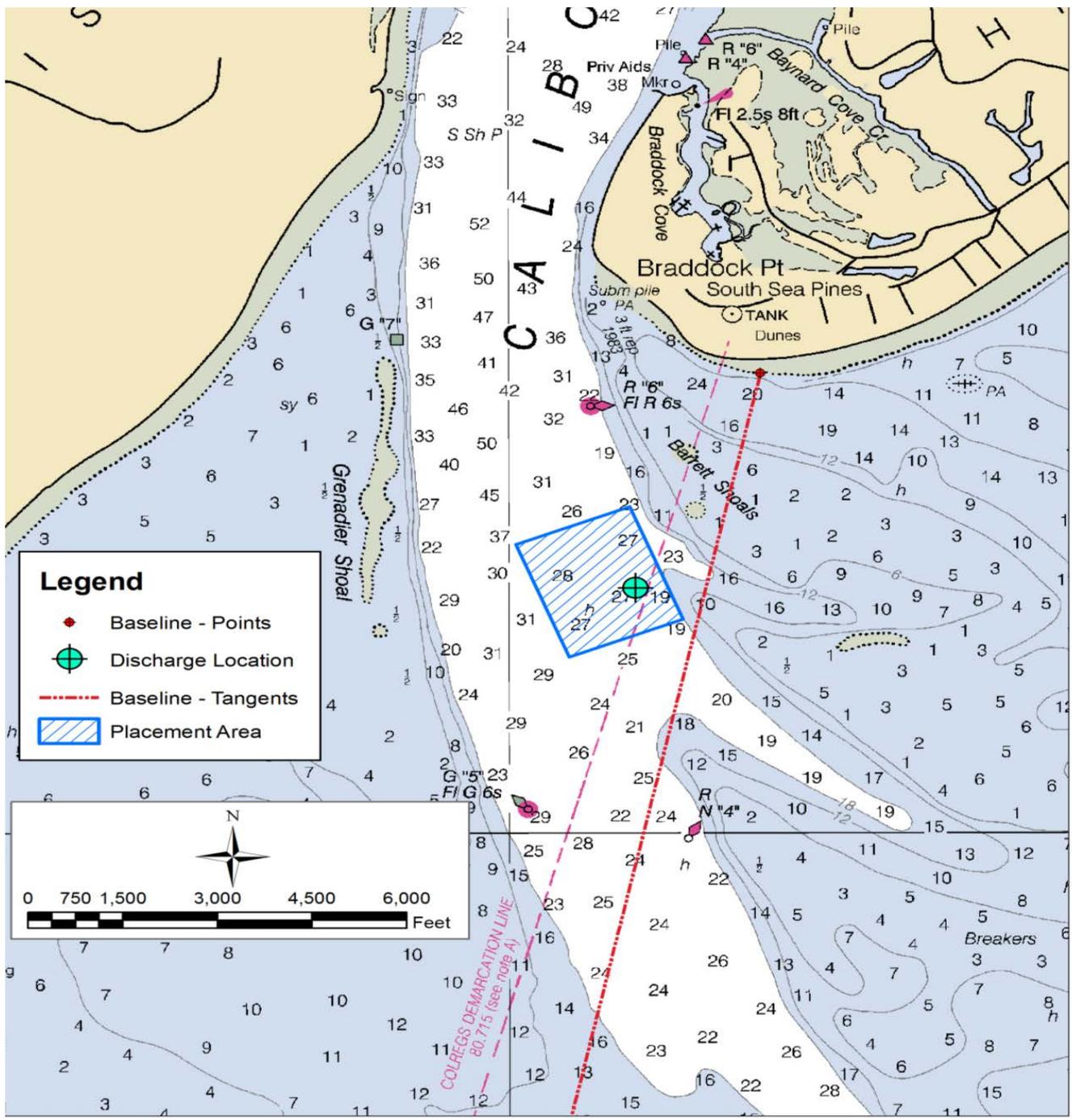
IOWD is allowed under both federal and state regulation. It is routinely used in other areas of the U.S. and has been used in recent years at two locations in South Carolina on the Intracoastal Waterway at DeWees Inlet, north of Charleston, and at the North Edisto River. In fact, the US EPA and U.S. Army Corps of Engineers developed a manual: "Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. – Testing Manual" (commonly referred to as the Inland Testing Manual) to guide evaluation of IOWD projects.

SIDA has assembled a Project Team with extensive experience in all aspects of dredging including experts in dredging in SC, in IOWD, in evaluation of potential biological impacts from dredging, and in numerical modeling to predict the effects of IOWD. Dr. Robert Engler, retired from the U.S. Army Corps of Engineers, was instrumental in development of the Inland Testing Manual and is an internationally recognized dredging expert. He is a primary member of the Project Team.

Placement Area

The location proposed for IOWD is along the west side of Barrett Shoals, 4600 feet from the shoreline of Hilton Head Island and approximately 8,100 feet from the shoreline of Daufuskie Island. Favorable characteristics are:

1. Water depth at this location is approximately 25 feet MLW.
2. It is an area of low biological activity, well removed from hard bottom or other sensitive habitats.
3. Evaluation of the placement location with respect to Threatened and Endangered Species and Essential Fish Habitat concludes that none will be harmed and any impact to the placement area and surrounding environment will be minimal and temporary. See Project Description pp. 6-9.



Modeling of Dredge Material Dispersion

The Project Team's scientists have used the best available modeling protocol and software to predict how the dredge material will spread when discharged. Here are their conclusions:

1. 99 percent of the discharged material will initially descend to the bottom and create a fluid mud layer on the bottom. Approximately 47% will almost immediately remain in suspension while up to 52% will descend to the bottom and remain there temporarily. Approximately 80% of the sediment on the bottom will erode within 2 days and the rest will erode within weeks.
2. The fluid mud will spread irregularly as far as 1,350 feet from the discharge pipe.
3. This will affect less than 1/10th of a square mile of existing sandy bottom. For reference, the recently permitted beach renourishment project at the southern end of Hilton Head will impact more than 10 times this area. Beach renourishment includes, by design, total disturbance of the area from which the sand is taken or "borrowed." It causes total burial of the active beach through the placement of the "borrowed" sand on the existing beach.
4. Net tidal currents at the placement site are seaward and will quickly erode the deposited sediments from the bottom and move them toward the open sea.
5. The sediments will be completely eroded from the site within weeks after the project is completed.
6. The project will not cause any permanent or long-term changes to the bottom.
7. The project will have minimal effects on suspended sediment concentrations in the discharge area.
8. Virtually no sediment concentrations or sedimentation will occur north of the mouth of the Calibogue Sound entrance at the southern tip of Hilton Head Island.

See Project Description pp. 9-11.

Monitoring Plan

Robust monitoring is planned prior to, during, and following dredging to evaluate the model predictions and measure effects related to the dredging and IOWD. This monitoring includes:

1. an onsite dredging and placement inspector,
2. bathymetric surveys,
3. water quality monitoring and
4. benthic monitoring

The monitoring will evaluate conclusively the dredge material placement and its effects. See Project Description pp. 11-12.

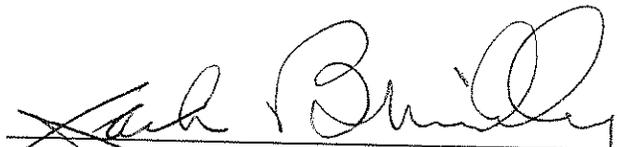
Funding and Sustainability

Hydraulic dredging with IOWD for this project is:

1. The best ecological alternative,
2. The only financially feasible solution for SIDA's members and our community,
3. To be funded entirely with member contributions and
4. The only alternative that is sustainable for future dredging requirements of the Sea Pines Waterways.

Timeline

SIDA does not know how long it will take regulators to review and decide whether to issue the federal and state permits. Assuming the permits are issued by early next year SIDA expects to begin dredging in November 2013 and complete it in April 2014.



Jack Brinkley, President
South Island Dredging Association, Inc.

EXHIBIT A

Application Form and Project Description

Joint Federal and State Application Form For Activities Affecting Waters of the United States Or Critical Areas of the State of South Carolina		This Space for Official Use Only	
<i>Authorities:</i> 33 USC 401, 33 USC 403, 33 USC 407, 33 USC 408, 33 USC 1341, 33 USC 1344, 33 USC 1413 and Section 48-39-10 et. Seq of the South Carolina Code of Laws. These laws require permits for activities in, or affecting, navigable waters of the United States, the discharge of dredged or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters. The Corps of Engineers and the State of South Carolina have established a joint application process for activities requiring both Federal and State review or approval. Under this joint process, you may use this form, together with the required drawings and supporting information, to apply for both the Federal and/or State permit(s).		Application No. _____ Date Received _____ Project Manager _____ Watershed # _____	
<i>Drawings and Supplemental Information Requirements:</i> In addition to the information on this form, you must submit a set of drawings and, in some cases, additional information. A completed application form together with all required drawings and supplemental information is required before an application can be considered complete. See the attached instruction sheets for details regarding these requirements. You may attach additional sheets if necessary to provide complete information.			
1. Applicant Last Name:		11. Agent Last Name (agent is not required):	
2. Applicant First Name:		12. Agent First Name:	
3. Applicant Company Name:		13. Agent Company Name:	
4. Applicant Mailing Address:		14. Agent Mailing Address:	
5. Applicant City:		15. Agent City:	
6. Applicant State:	7. Applicant Zip:	16. Agent State:	17. Agent Zip:
8. Applicant Area Code and Phone No.:		18. Agent Area Code and Phone No.:	
9. Applicant Fax No.:		19. Agent Fax No.:	
10. Applicant E-mail:		20. Agent E-mail:	
21. Project Name:		22. Project Street Address:	
23. Project City:	24. Project County:	25. Project Zip Code:	25. Nearest Waterbody:
26. Tax Parcel ID:	27. Property Size (acres):	28. Latitude:	29. Longitude:
30. Directions to Project Site (Include Street Numbers, Street Names, and Landmarks and attach additional sheet if necessary):			
31. Description of the Overall Project and of Each Activity in or Affecting U.S. Waters or State Critical Areas (attach additional sheets if needed)			
32. Overall Project Purpose and the Basic Purpose of Each Activity In or Affecting U.S. Waters (attach additional sheets if needed):			
of Calibogue Sound. uth of the mouth			
33. Type and quantity of Materials to Be Discharged Dirt or Topsoil: _____ <input type="checkbox"/> cubic yards Clean Sand: 27,000 <input checked="" type="checkbox"/> cubic yards Mud: 162,000 <input checked="" type="checkbox"/> cubic yards Clay: 111,000 <input checked="" type="checkbox"/> cubic yards Gravel, Rock, or Stone: _____ <input type="checkbox"/> cubic yards Concrete: _____ <input type="checkbox"/> cubic yards Other (describe): _____ <input type="checkbox"/> cubic yards TOTAL: 300,000* cubic yards		34. Type and Quantity of Impacts to U.S. Waters (including wetlands). Filling: 56* <input checked="" type="checkbox"/> acres <input type="checkbox"/> sq.ft. ~300,000* <input checked="" type="checkbox"/> cubic yards Backfill & Bedding: _____ <input type="checkbox"/> acres <input type="checkbox"/> sq.ft. _____ <input type="checkbox"/> cubic yards Landclearing: _____ <input type="checkbox"/> acres <input type="checkbox"/> sq.ft. _____ <input type="checkbox"/> cubic yards Dredging: ~50.5 <input checked="" type="checkbox"/> acres <input type="checkbox"/> sq.ft. ~300,000 <input checked="" type="checkbox"/> cubic yards Flooding: _____ <input type="checkbox"/> acres <input type="checkbox"/> sq.ft. _____ <input type="checkbox"/> cubic yards Draining/Excavation: _____ <input type="checkbox"/> acres <input type="checkbox"/> sq.ft. _____ <input type="checkbox"/> cubic yards Shading: _____ <input type="checkbox"/> acres <input type="checkbox"/> sq.ft. _____ <input type="checkbox"/> cubic yards TOTALS: 106.5 acres _____ sq.ft. ~600,000 cubic yards *Impact is temporary. Placement site is dispersive with no net accumulation anticipated.	

35. Individually list wetland impacts including mechanized clearing, fill, excavation, flooding, draining, shading, etc. and attach a site map with location of each impact (attach additional sheets if needed).

Impact No.	Wetland Type	Distance to Receiving Water body (LF)	Purpose of Impact (road crossing, impoundment, flooding, etc)	Impact Size (acres)
1	Tidal Creeks, Marinas	0	Maintain Navigation	50.5
2	Caribogue Sound	0	Maintain Navigation	56*
*Impact is temporary. Placement site is dispersive with no net accumulation anticipated.				Total Wetland Impacts (acres)
				106.5

36. Individually list all seasonal and perennial stream impacts and attach a site map with location of each impact (attach additional)

Impact No.	Seasonal or Perennial Flow	Average Stream Width (LF)	Impact Type (road crossing, impoundment, flooding, etc)	Impact Length (LF)
Total Stream Impacts (Linear Feet)				

37. Have you commenced work on the project site? YES NO If yes, describe all work that has occurred and provide dates.

38. Describe measures taken to avoid and minimize impacts to Waters of the United States:

The applicant evaluated numerous alternatives, as outlined in the attached, "Identification and Examination of Dredged Material Management Alternatives" Report, and the avoidance and minimization of impacts are described in the attached "SIDA/Hilton Head Dredging and Open Water Placement General Dredging Plan," "Biological Assessment Report," and "Essential Fish Habitat Report."

39. Provide a brief description of the proposed mitigation plan to compensate for impacts to aquatic resources or provide justification as to why mitigation should not be required (Attach a copy of the proposed mitigation plan for review).

No mitigation is planned for this project. Extensive efforts have been made to avoid and minimize impacts, including reducing the previously permitted dredge area (~3,400 ft reduction of dredge area in Baynard Creek).

40. See the attached sheet to list the names and addresses of adjacent property owners.

41. List all Corps Permit Authorizations and other Federal, State, or Local Certifications, Approvals, Denials received for work described in this application.

Department of the Army 2000-1P-424; OCRM-2000-1P-424-P

42. Authorization of Agent. I hereby authorize the agent whose name is given on page one of this application to act in my behalf in the processing of this application and to furnish supplemental information in support of this application.

[Signature] 9-5-12
 Applicant's Signature Date

43. Certification. Application is hereby made for a permit or permits to authorize the work and uses of the work as described in this application. I certify that the information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent for the applicant.

[Signature] 9-5-12 *[Signature]* 9/7/12
 Applicant's Signature Date Agent's Signature Date

¹The application must be signed by the person who desires to undertake the proposed activity or it may be signed by a duly authorized agent if the authorization statement in blocks 41 and 42 have been completed and signed. 18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or device; or discloses a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than \$10,000 or imprisoned not more than five years or both.

31. Overall Project Description

The South Island Dredging Association (SIDA) is seeking Clean Water Act (CWA) permits to dredge existing marina basins and access channels on Hilton Head Island and place approximately 300,000 cubic yards of silt, clay, and sand materials in inshore waters south of the mouth of Calibogue Sound. SIDA is comprised of the Harbour Town Boat Slip Owners Association, South Beach Marina LLC, Sea Pines South Beach Property Owners Association, Gull Point Owners Association Inc. and Baynard Property Owners Association. Proposed dredge areas include Harbour Town Marina, Gull Point Marina, South Beach Marina, Portside docks, Port Villas docks, two residential docks, Baynard Cove Creek’s Community Dock and channels leading to these areas (see Figure 1). Maintenance dredge permits for these areas have been issued previously by the U.S. Army Corps of Engineers (USACE, Permit No. 2000-1P-424) and the South Carolina Department of Health and Environmental Control, Office of Ocean and Coastal Resource Management (SCDHEC-OCRM Permit Number OCRM-2000-1P-424-P), which remains active.

The dredge material was tested in 2000 and 2001, permitted by regulatory authorities pursuant to Section 401 of the Clean Water Act for discharge into U.S. Waters and tested again in 2008 with consistent results. The composition of samples taken from the dredge sites is virtually identical to those taken from the open waters and sediments of Calibogue Sound. There is nothing in the dredge material that would harm marine life or the estuary.

Maintenance dredging for eight different channel and marina areas will achieve currently (SCDHEC-OCRM) and previously (USACE) permitted navigable depths of 5 to 8 feet mean low water (MLW), plus an allowable 1-foot overdredge, for recreational and commercial navigation, as shown on Figures 2-19. The dredging is needed because of major shoaling of these areas and the existing shallow depths prevent navigation of recreational and commercial vessels in many areas during much of the tidal cycle. Proposed dredge depths and areas for each waterway are presented below in Table 1.

Table 1. Dredge Areas and Depth for Each Site

Location	Acres	Depth (MLW)
Harbour Town Marina		
Entrance Channel	6.5	-8
Marina	8.3	-8
Braddock Cove Creek		
Entrance Channel to South Beach Marina, including Gull Point Marina	12.6	-8
South Beach Marina	2.1	-8
Upstream of S. Beach Marina to Port Villas	2.6	-6
Baynard Cove Creek		
Entrance Channel	13.6	-8
Community Dock	1.5	-5
Creek	3.3	-6
TOTAL	50.5	

This footprint is smaller than the previously permitted dredge footprint since the portion of Baynard Creek above the Community Dock has been eliminated from the dredge plan except for the first 375 feet (see Figure 12). This modification represents an approximately 3,400 foot reduction in the length of Baynard Creek channel to be dredged. The areas removed from this application are significantly naturalized and dredging would cause unavoidable impacts to oyster reefs and vegetation.

Inland open water discharge (IOWD), permitted pursuant to and regulated by Section 404(b) 1 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act, is planned at a site in the lower sound near the entrance to the sound. The "Evaluation of Dredge Material Proposed for Discharge in Waters of the U.S. – Testing Manual" (USACE, USEPA, 1998; Inland Testing Manual) provides guidance regarding technical protocols under the CWA for evaluating proposed discharges of dredged material associated with navigational dredging projects in to waters of the U.S. To determine if this project complies with the applicable acts, the 404(b) 1 Guidelines and the Inland Testing Manual, the following evaluations have been completed:

- Appendix I: "Identification and Examination of Dredged Material Management Alternatives" (Alternatives Analysis; GEL, 2012)
- Appendix II: "SIDA/Hilton Head Dredging and Open Water Placement General Dredging Plan" (Dredge Plan; Moffatt & Nichol, 2012)
- Appendix III: "Biological Assessment Pursuant to the Endangered Species Act for Maintenance Dredging and Disposal at Hilton Head Island, South Carolina" (Biological Assessment; MG Associates, 2012)
- Appendix IV: "Essential Fish Habitat Assessment for Maintenance Dredging and Disposal at Hilton Head Island, South Carolina" (Essential Fish Habitat Assessment; MG Associates, 2012)
- Appendix V: "Dredge Discharge and Bottom Deposition Analysis for Maintenance Dredging and Disposal at Hilton Head Island, South Carolina" (Modeling Report; MG Associates, 2012)
- Appendix VI: "SIDA/Hilton Head Dredging and Open Water Placement Monitoring Plan" (Monitoring Plan; Moffatt & Nichol, 2012).
- Appendix VII: "Sediment Testing Report, South Island Dredging Association, Hilton Head Island, South Carolina" (GEL Sediment Testing Report; GEL Engineering LLC, 2008)

Each report is attached and is a part of this permit application. Portions of the reports are summarized below.

Details of the dredging are outlined in the Dredge Plan. The project proposes to use a small hydraulic dredge with a maximum intake diameter of 10-12 inches to dislodge, remove, and transport the sediment via a pipe to an IOWD placement site, as shown as Figure 20 and designated as Site 5 in the Alternatives Analysis. The distance between the dredge areas and Site 5 is 2 to 3.5 miles depending on dredge location. A booster pump station will be placed in the pipeline as needed to provide sufficient additional power to transport the material to the placement site. Site 5 is located at coordinates 32° 5' 46" N, 80° 49' 37" W in an area with rippled sand bottom habitat. The location of the proposed pipeline discharge is approximately 4,600 feet from the shoreline of Hilton Head Island and approximately 8,100 feet from the shoreline of Daufuskie Island. The placement site depth is about 27-28 ft. (MLW).

Dredging will be performed using a standard hydraulic cutterhead dredge typical to marine projects. Dredging is planned for the period from November 1 through April 30 which is documented as an appropriate period of lower biological activity in the Biological Assessment and Essential Fish Habitat Assessment. Dredging may be conducted up to 24 hours per day. The dredged sediment will be pumped via pipeline to Site 5. The pipeline route along the edge of the shore will not cause any potentially significant impact and has been selected to have minimal effects on navigation.

The Site 5 placement location is south of the mouth of Calibogue Sound, further from land and nearer the territorial sea baseline than the previous locations proposed for IOWD in 1999. The previous IOWD locations have been designated as Sites 1 and 2. Site 1 is in Calibogue Sound northwest of Harbour Town Marina, and Site 2 is along the edge of Calibogue Sound, south of Braddock Creek. Previously designated Site 3 is a shoreline renourishment site immediately south of Harbour Town, and previously designated Site 4 is a beach renourishment site on Hilton Head Island south of Braddock Creek. Site 3 was filled in 2003 and is no longer available, and the Town of Hilton Head Island found the sand quality from the dredge area to be unsatisfactory for beach renourishment (Site 4) in 2003, so this use is no longer being proposed.

Site 5 is a superior location for IOWD compared to Sites 1 and 2 because it is further removed from sensitive habitats. Site 1 is more inland and a few people expressed concerns about potential impacts to the May and Cooper Rivers. Although the modeling conducted at the time indicated that there would be no impacts to these rivers, removing this IOWD location responds to that concern. Similarly, Site 2 is closer to sensitive habitats (hard bottom with greater biologic diversity) than Site 5.

Site 5 has been selected because it is characterized by a sand bottom along the margin of Barrett Shoals at the mouth of Calibogue Sound. It is relatively flat and not near hard bottom or other potentially sensitive habitats. As described in the Biological Assessment and Essential Fish Habitat Assessment, this area is characterized by relatively low biological diversity. Furthermore, the modeled deposition pattern shows that the sediments will conservatively cover up to 56 acres at one time or another during the 6 months dredging is planned. However, due to the dispersive nature of the placement site, the sediments will disperse over days to weeks so that actual coverage at any given time will be much less as shown by the Modeling Report. The modeling predicts that no appreciable accumulation of sediments will occur outside the immediate IOWD area, including either on beaches or in sensitive bottom habitats. Thus, the sediments will be disbursed, returned to ambient suspended sediment concentrations, and become part of the natural system from which they originated. The Modeling Report, Biological Assessment and Essential Fish Habitat Assessment document the areas of impact and that these impacts will be minimal and temporary and will not result in an unacceptable adverse impact as described by the CWA 404(b) 1 Guidelines.

The sediment will be placed from the pipeline at a height approximately 3 feet above the bottom using a bottom tremie pipe to diffuse the discharge, reduce velocity, and evenly place the sediment on the bottom. Discharge at this depth with a bottom tremie will result in most sediment initially accumulating on the bottom pending dispersion by currents. This technique will result in minimal impacts to water quality as documented by the Modeling Report. This report shows that the plume of elevated total suspended solids will be localized to the placement area and depths near the bottom, as shown by Figures 6-1 through 6-4 in the Modeling Report. No increase in total suspended solids will be observable at the water surface.

Continuous dredging (24/7) is proposed for the project. As stated in the Modeling Report, the effect of suspended sediments on areas outside of the project area in the vicinity of the Calibogue Sound

entrance is negligible due to the effects of tidal dominated currents at the disposal site. The tidal dominated currents at the disposal site range from a maximum ebb velocity of 1.0 m/s (meters per second) 3.3 ft/s (feet per second) and a maximum flood velocity of 0.8 m/s 2.6 ft/s. Currents will move suspended sediments as related to tidal cycle and longer-term river flow with dominant sediment movement seaward. Given these negligible potential effects of the proposed project on areas north of the Calibogue Sound entrance, it is proposed that dredging and placement be conducted 24 hours per day, except when repositioning the dredge, conducting equipment repair or maintenance, during weather delays, or if a manatee is observed within 100 yards of the dredge intake or discharge location. Any tidal restriction would extend the duration of the project by a factor or two in order to complete the same maintenance dredging volume. In return for this extended project duration, there would be negligible benefit by reducing effects on areas north of the Calibogue Sound entrance.

Previously Permitted Dredging and Placement Activities

In June 2000 SIDA filed applications with regulatory authorities to dredge hydraulically and placement of the material by discharge into designated IOWD Sites 1 and 2 in Calibogue Sound. In support of its applications SIDA submitted various test and data results. One such submission was an alternatives analysis prepared by Applied Technology and Management, Inc. dated August 18, 2000, entitled "Identification and Examination of Practicable Dredged Material Management Alternatives, Task 1 Final Document" (ATM's Alternatives Analysis), a copy of which is included in GEL's Alternatives Analysis. As part of its previous testing and data gathering in 2000, SIDA conducted extensive testing of the material to be dredged, as noted previously and outlined in the attached "Dredged Material Environmental Effects Evaluation" completed by ATM in April 2000. The tests found no elevated concentrations of chemical constituents of potential concern.

GEL conducted additional sediment sampling and analysis in 2008 to evaluate the consistency of the bulk sediment chemistry with the bulk chemistry sediment sampling and analysis completed in 2000. The GEL Sediment Testing Report documents that the bulk sediment chemistry is very similar between the sediment analysis in 2000 and 2008, demonstrating that there had been no potentially significant changes in sediment quality. These findings are consistent with the fact that there are virtually no potentially water-polluting activities in the area, including Sea Pines.

After input from various federal and state agencies and a public hearing in 2000, SIDA suspended its pursuit of IOWD because of threatened legal action. The threatened litigation had the potential to be protracted. Because of the urgent need to dredge Harbour Town Marina, SIDA agreed to dispose of the dredge material by taking it by barge to the federal Port Royal Offshore Dredge Material Disposal Site (ODMDS), approximately 13 miles off shore. As part of the application for a permit to use the ODMDS, additional sediment testing was performed to confirm the non-toxic nature of the sediments. Based on the findings of these toxicological evaluations, the USACE, EPA, and DHEC-OCRM issued the permits for use of the ODMDS.

Dredging of Harbour Town Marina was completed in 2003. Dredging the other waterways was discontinued before completion due to unacceptable leakage into regulated Waters of the U.S. from the barge that was to carry the dredged material to the ODMDS. As is turned out, there were and are no barges with bottom dumping capability that can transport hydraulically dredged clay and silt-rich material with high water content from these waterways without excessive leakage, as documented in GEL's Alternatives Analysis. As the permit holder, SIDA was responsible for the actions (CWA violations) of its independent contractor even though it had no operational control over the dredge itself. Thus,

SCDHEC levied civil penalties against the participants, including SIDA. Federal and state officials stated at the time that the contractor had discharged about 75% of the 140,000 cubic yards of dredge material into Calibogue Sound in violation of the CWA. The asserted fines and related litigation were resolved by February 2008. It is noteworthy that no observations of negative environmental consequences resulted from the unregulated discharge of sediment into Calibogue Sound.

SIDA then began evaluating how to conclude the dredging it had started at Braddock and Baynard Creeks. Also, by 2008 Harbour Town Marina needed to be dredged again. Given this situation, SIDA began to evaluate all potential dredge material disposal alternatives. The evaluated alternatives are presented in GEL's Alternatives Analysis, which is summarized below.

Identification and Examination of Dredged Material Management Alternatives

The Alternative Analysis was prepared by GEL to review identified alternatives and determine the only feasible and practicable alternative under federal and state regulations. GEL's Alternatives Analysis is an update of ATM's Alternatives Analysis. The various alternatives evaluated include the following:

- Confined Disposal Facility in Sea Pines
 - The only existing confined disposal facility (CDF) in Sea Pines is the Calibogue Cay CDF. Its use is restricted by covenants for the exclusive use of properties in Calibogue Cay to dredge Back Creek and requires unanimous agreement of the property owners to modify the restriction. A detailed evaluation of the Calibogue Cay site was performed and determined that CDF could contain some of the SIDA sediment along with the Back Creek sediment if the CDF were emptied and enlarged. A request from the Harbour Town Slip Owners Association asking Calibogue Cay property owners to allow use of the CDF was denied.
- Building a CDF in Other Sea Pines Locations
 - The ATM Alternatives Analysis examined several potential sites in Sea Pines for construction of a CDF. The sites were again reviewed in GEL's Alternatives Analysis, and none of the locations was found to be either available or practicable.
- Construct a CDF Outside Sea Pines
 - The only identified potential location to construct a CDF was identified in an area of mature maritime forest on Daufuskie Island, which is only accessible by boat. Soils of the site were found to be sandy and unsuitable for construction of dikes. Therefore, soil would have to be imported by barge to construct the CDF. Once full, there is no practical means to empty the CDF because the island has no bridge access. Therefore, this location was found to be impracticable for a CDF. ATM's Alternatives Analysis examined various barrier islands within 5 miles of the Sea Pines Waterways. None was available or practicable then and, for reasons ATM described, none would be available today.
- Mechanical Dredging and Transportation to the ODMDS
 - Mechanical dredging requires multiple handling of the dredge material increasing likelihood for spillage or leakage, long haul to the ODMDS, and is

slower and considerably more expensive than hydraulic dredging. It also creates greater turbidity and habitat disturbance in the dredged areas; OCRM regulation R.30-12.G (k) specifies hydraulic dredging as the preferable dredge method. Further, mechanical dredging does not work as well around docks as hydraulic dredging and would have more difficulty reaching dredge areas in Braddock and Baynard Creeks. Finally, this alternative was used by SIDA in 2003 in lieu of IOWD and found to be unworkable.

- Hydraulic Dredging with IOWD
 - The other tests, data and submissions in support of SIDA's permit show that SIDA's plan meets and exceeds the requirements for hydraulic dredging with IOWD. Based on the evaluation of alternatives discussed in the report, SIDA, its consultants and others who conducted an independent analysis determined that IOWD is the only feasible and practicable dredge alternative. It is the only alternative that is practicable for SIDA's members or, indeed, for the entire Sea Pines community.

Biological Assessment for Maintenance Dredging and Disposal at Hilton Head Island, South Carolina

As part of the permitting process, the USACE is required to comply with the requirements of the National Environmental Policy Act of 1969 (NEPA), an umbrella law that requires review of projects for potential impacts to the environment. As such, NEPA requires compliance with the Endangered Species Act (ESA) which is administered by the United States Fish & Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS). USFWS or NMFS will typically request that the USACE include a Biological Assessment (BA) as part of the permitting review process if species listed as endangered or threatened under the ESA or critical habitat are or may be present in the project vicinity.

This BA was completed in anticipation of its being required as part of the permit decision process. The BA provides information regarding the proposed project and identifies any effects that the project may have on federally listed species. Potential effects from the project include the effects to the creeks from dredging, as well as effects to fish communities and habitats at the dredged material placement site. Federally protected species that are listed for Beaufort County and may have habitat or occurrence in the project area were considered and are included in the following list. Most of these species will not be affected because they either are not present at all in the project areas or are not present during the time period when the proposed project will take place (noted with an asterisk).

- West Indian manatee (*Trichechus manatus*)
- Bald eagle (*Haliaeetus leucocephalus*)
- Wood stork (*Mycteria americana*)
- Piping plover (*Charadrius melodus*)
- Finback whale (*Balaenoptera physalus*) *
- Humpback whale (*Megaptera novaeangliae*) *
- North Atlantic right whale (*Eubalaena glacialis*) *
- Sei whale (*Balaenoptera borealis*) *
- Blue whale (*Balaenoptera musculus*) *
- Sperm whale (*Physeter macrocephalus*) *
- Green sea turtle (*Chelonia mydas*) *

- Kemp's ridley sea turtle (*Lepidochelys kempii*) *
- Leatherback sea turtle (*Dermochelys coriacea*)
- Loggerhead sea turtle (*Caretta caretta*)
- Shortnose sturgeon (*Acipenser brevirostrum*) *
- Atlantic sturgeon (*Acipenser oxyrinchus*)

The potential project effects were evaluated based on review of available data and a site inspection of the areas to be dredged. This analysis includes the following elements:

- Description of the proposed action;
- Summary of the alternatives considered for the project;
- Literature review of previous site-specific studies describing the project area environment, as well as literature review of studies on the effects of dredged material placement in inland open water in South Carolina and the US;
- Description of the existing conditions observed during site surveys of the proposed dredging action area;
- Descriptions of federally listed species and habitat in the action area;
- Estimates of effects on federally listed species and habitats; and
- Descriptions of avoidance, minimization and mitigation for the project.

The proposed project will have no effect on the following species because they are not present during the season in which the project would be conducted: bald eagle, finback whale, humpback whale, North Atlantic right whale, sei whale, sperm whale, green sea turtle, Kemp's ridley sea turtle, and shortnose sturgeon.

No Critical Habitat Areas exist in the action area, and no listed species records were found, except for a manatee in Harbour Town Marina during the summer. Leatherback and loggerhead sea turtles may be present in the project action area. However, they are unlikely to be affected by the proposed project. The project includes removal of a very small area of beach at the Braddock Cove Creek inlet, but this is considered low-quality turtle nesting habitat. Therefore, these turtles may be affected, but are unlikely to be adversely affected by the proposed project.

The wood stork and piping plover are unlikely to be affected by the project despite a minor loss of potential foraging habitat in the dredged areas, which is considered insignificant as compared to the available foraging habitat. The applicant will apply every practical measure to avoid and minimize this habitat loss and disturbance. The Atlantic sturgeon is unlikely to be affected by the project despite the loss of potential foraging habitat in the dredged material placement area. The location of the placement area was chosen based on the minimum harm to all species of concern, listed and managed species, and the higher vulnerability of hard bottom habitats as compared to unconsolidated sandy bottom habitat such as exist at the selected placement site.

Since the project will extend into April (one month past the typical close of the dredge window, there is a higher potential that West Indian Manatee will be in the project area. Therefore, the Monitoring Plan includes a provision for a full-time observer during April with specific provisions for actions to be taken in the event of manatee sightings.

Essential Fish Habitat Assessment for Maintenance Dredging and Disposal at Hilton Head Island, South Carolina

This report provides information for the NMFS regarding effects of the proposed project on federally managed fish and essential fish habitat in accordance with the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). Potential project effects include impacts to the creeks from dredging, as well as effects to fish communities and habitats at the dredged material placement site. The potential project effects were evaluated based on review of available data and a site inspection of the areas to be dredged. This analysis includes the following elements:

- Description of the proposed action;
- Summary of the alternatives considered for the project;
- Literature review of previous site-specific studies describing the project area environment, as well as literature review of studies on the effects of dredged material placement in open water in South Carolina and the US;
- Estimates of essential fish habitat impacts in the dredging action area;
- Estimates of essential fish habitat impacts in the placement action area;
- A description of managed fisheries in the action area;
- Estimates of effects on federally managed fish species; and
- Descriptions of avoidance, minimization and mitigation for the project.

The proposed maintenance dredging will remove sediments from previously disturbed areas, and the project will not include dredging of new areas or depths beyond that previously permitted and dredged (i.e., there is no “new work” material to be dredged). The proposed dredging will affect the areas of dredging and placement by increasing turbidity during dredging and deepening shallow and intertidal habitats (but not beyond depths previously permitted and dredged). The potential effects on managed fish and fish habitat from the proposed project include:

- Temporary suspension of sediments in the water column which may abrade gills and affects foraging;
- Burial of individuals and 56 acres of sand bottom habitat at the placement area;
- Sediments suspended by the dredge cutterhead may settle on creek bottom habitat in adjacent areas;
- Deepening of 50.5 acres in marina basins and creeks from intertidal and shallow benthic soft bottom communities to shallow subtidal habitats; and
- Dredge entrainment and mortality of benthic infaunal organisms.

The potential effects specific to Essential Fish Habitat (EFH) from the proposed project are burial of foraging habitat in the placement area, temporary suspension of sediment in the water column at the placement area, temporary removal of benthic soft bottom communities in the placement area (via burial) and dredging areas, and loss of shallow and intertidal flat habitat in the dredging areas. The area temporarily buried by the deposited sediment is small as compared to the size of Calibogue Sound. Also, the project is small (56 acres) as compared to other permitted open water placement projects in the vicinity (e.g., the Port Royal ODMDS is more than ten times larger [960 acres], and the recent Hilton Head beach nourishment at the south end of the island was 670 acres). Although the proposed project is not an ocean site such as the ODMDS or a beach nourishment project, it is helpful to compare these

acreages to put the scale of the proposed project in context with other dredging related projects in the region. Species will recolonize disturbed sediment in areas affected by the dredging. The recovery speed of the benthic community varies between a few weeks to 6 months (Clarke, D., and Miller-Way, T., 1992, Van Dolah et al., 1984).

The potential effects to managed fish species are related to temporary turbidity and suspended sediment effects in the water column, removal of shallow habitat, and temporary habitat burial in the placement area. Managed fish species expected to be affected include summer flounder and penaeid shrimp. Coastal sharks, particularly spiny dogfish and Atlantic sharpnose sharks, snapper and grouper species, and Spanish mackerel may experience minor impacts.

The proposed avoidance, minimization, and mitigation measures will significantly reduce the impacts and measure (via monitoring, as detailed in the Monitoring Plan) those impacts, which are unavoidable. Given the limited and temporary nature of the impacts, the dredging and disposal will not result in any significant impacts.

Dredged Material Discharge and Bottom Deposition Analysis for Maintenance Dredging and Disposal at Hilton Head Island, South Carolina

The Modeling Report summarizes an evaluation of the dredged material fate. This includes estimates of the effects of the proposed discharge on the water column suspended sediment concentrations. It also includes estimates of the area that sediment will settle on the bottom at the placement site.

Approximately 99 percent of the material at the placement site will initially descend to the bottom as a fluid mud layer within the placement area. This fluid mud will spread and flow along the bottom as an underflow. Some of the sediments from the underflow will be entrained into the overlying water column during placement and dispersed by the ambient tidal currents. The sediments that are not entrained into the overlying water column settle to the bottom in a deposit. This deposit initially has very low density and gradually gains cohesive strength and decreases in thickness as it consolidates over a period of days. Given the high tidal current velocities at the site and the low density of the sediments, the placement site is dispersive. This means that the tidal currents will then erode this deposited sediment from the bottom and incorporate the material in to the natural sediment transport system.

This analysis used four different models to addresses different phases of the discharge process:

1. CORMIX was used to evaluate the initial near-field mixing of the plume up to the point of the initial underflow formation. CORMIX is a US Environmental Protection Agency (EPA) supported modeling system for the analysis of plumes and mixing zones.
2. The Pipeline Discharge FATE (PDFATE) model was used to evaluate the underflow spreading and predict the deposition of sediments on the bottom and the entrainment of sediments into the overlying water column. The results from the CORMIX model are used as input to the PDFATE model.
3. The long-term stability of the sediments deposited on the bottom was evaluated using the Environmental Fluid Dynamics Code (EFDC) coupled with the SEDZLJ sediment transport model (EFDC-SEDZLJ). The sediment deposited on the bottom predicted by PDFATE was used as input to this model.

4. The far-field dispersion model described by Kuo et al. (1985) and used by the USACE's DREDGE model (Hayes and Je, 2000) was used to predict the dispersion of the sediments in the ambient flow field. The results of the PDFATE model and the EFDC-SEDZLJ model are used as input to the far-field dispersion model.

Based on the results of the CORMIX and PDFATE models, sediments will deposit from this underflow on the bottom within a radius extending 410 meters (1,350 feet) from the discharge location. The underflow is a density current that will flow in a down-slope direction, and the path of the flow will change over time as sediments are temporarily deposited on the bottom. The maximum bottom area potentially affected by the underflow is approximately 56 acres of existing sandy bottom. The area of 56 acres is based on conservative model inputs, and the actual area may be smaller. Regardless, it will not cover any of the identified hard bottom areas in Calibogue Sound. It should be noted that the bottom area potentially affected by the underflow is an irregular shape covering 56 acres. The proposed placement area defined for permitting purposes is rectangular with an area of 106 acres. Not all of the bottom in the rectangular placement area would be affected by the underflow.

Following deposition of the sediments on the bottom from the underflow, the tidal currents will begin to erode the sediments. Given the high tidal current velocities at the site and the low density of the sediments, the placement site is dispersive. This means that the tidal currents will then erode this deposited sediment from the bottom and incorporate the material in to the natural sediment transport system. This erosion process will occur continuously throughout the 6-month project as sediments are placed at the site. The sediments will be completely eroded from the placement site within weeks after the project is completed. The project will not cause any permanent or long-term changes to the bottom.

The sediments entrained into the water column and carried away by the currents will create a plume of suspended sediments. The contributions from three sources are included in estimates of the sediment plume concentrations: entrainment at the pipe outfall; entrainment along the underflow surface; and erosion of sediments recently deposited on the bottom. The resulting water column concentrations are relatively low because the underflow of fluid mud is spread along the bottom. Therefore, the source of entrained sediments is spread over an area on the bottom rather than a point source at the end of the dredge pipe.

The peak ebb and flood currents cause temporary total suspended sediment (TSS) concentrations up to 11 mg/L above ambient background concentrations within 3 feet above the bottom over a localized area downstream from the underflow. For reference, Applied Technology and Management (ATM) measured a background concentration of 68 mg/L in 1999 (ATM, 2000a). There is no explicit South Carolina water quality standard for TSS. However, the South Carolina water quality standard for turbidity of 25 NTU is approximately equivalent to a TSS concentration of about 37 mg/L. Therefore, the natural ambient concentrations routinely exceed the water quality standard for turbidity at this location. The 11 mg/L TSS plume concentrations are equivalent to 16 percent of the observed background concentration, and approximately 30 percent of the concentration equivalent to the turbidity water quality standard.

Concentrations exceeding 10 mg/L above the background concentration would extend a maximum distance of 1,900 feet from the discharge point at 3 feet above the bottom. Because the sediment source is at the bottom, the highest concentrations occur at the bottom and concentrations gradually decrease as the sediments disperse vertically in the water column. Concentrations at elevations more

than 6 feet above the bottom are minimal. No effects on suspended sediments would be detectable at the water surface.

Current speeds equal to half of the peak current speed show very low suspended sediment concentrations. The lower current speed causes much lower entrainment of sediment from the underflow into the overlying water column (5 percent of the peak value). Therefore, the project would cause only a very small increase in suspended sediment concentrations for much of the tidal cycle. Additionally, the predicted far-field suspended sediment concentrations from the proposed open water placement are within the natural range of concentrations experienced during typical conditions. Overall, the proposed project would have minor effects on suspended sediment concentrations in Calibogue Sound.

The net transport of sediments at the placement site is toward the ocean. In general, tidal inlets exhibit a net transport in the flood direction near the margins of the inlet (i.e., close to the shorelines), and a net ebb transport in the main channel. Because the placement site is located in the ebb channel of the inlet, the net transport of sediments from the site will be in the ebb direction primarily towards the south-southeast. Therefore, a majority of the sediments placed at the site will ultimately be transported toward the ocean.

The bottom deposition of sediments from the proposed project is negligible in areas outside of the placement site in the vicinity of the Calibogue Sound entrance. Sediments suspended into the water column will ultimately settle in quiescent areas with low current velocities. Dispersion of the sediments in areas beyond the immediate Calibogue Sound entrance area would be in very low concentrations. As a result, the deposition thickness of these sediments in quiescent areas would be indistinguishable from the deposition caused by ambient sediments in the environment. Based on these results, and given the distance between the selected placement area and inland areas of concern (such as the Cooper and May Rivers), there would be no appreciable increase in suspended sediment concentration or sedimentation in locations further inland, such as these two rivers. Furthermore, these suspended sediments will not cause appreciable deposition in the vicinity of Calibogue Sound inlet or Barrett Shoals because the high current speeds in the area will keep these fine sediments in suspension.

One management technique considered to minimize potential project effects is to limit dredging to only the ebbing phase of the tide. However, given the negligible potential effects of the proposed project on areas north of the Calibogue Sound entrance, it is not recommended to restrict dredging placement activities to ebbing tides. The tidal restriction would extend the duration of the project by a factor of two in order to complete the same maintenance dredging volume. In return for this extended project duration, there would be negligible benefit by reducing effects on areas north of the Calibogue Sound entrance.

Potential project effects on other water quality variables were also evaluated, including dissolved oxygen, salinity, temperature and pH. The project will have minimal, if any, adverse effect on dissolved oxygen concentrations and will not cause a violation of the water quality standard. The project will have negligible effects on salinity, temperature and pH in Calibogue Sound.

SIDA/Hilton Head Dredging and Open Water Placement Monitoring Plan

Monitoring will be conducted prior to, during, and following dredging and placement to determine actual effects of IOWD at this location and in accordance with the attached Monitoring Plan. Monitoring will include an onsite dredging and placement inspector, bathymetric surveys, water quality monitoring,

sediment grain size testing, and biological monitoring. These different monitoring activities are proposed to take place pre-dredge and placement, during dredging and placement activities, and post-dredge and placement until ambient conditions return. The specific monitoring is described in the Monitoring Plan, the requirements of which will be proposed for inclusion in the dredge permits. The purpose of the monitoring will be to determine the reliability of the predicted effects and ensure and/or document that all dredging and placement activities occur in accordance with permit requirements. All monitoring reports described in the Monitoring Report will be submitted to the applicable regulatory and natural resources agencies pre-, during, and post-dredging and placement activities.

EXHIBIT B

Sea Pines Waterways at Low Tide



Harbour Town Yacht Basin – Commercial Area - North Side of Entry



Harbour Town Yacht Basin – South Side of Entry



Harbour Town Yacht Basin – End of Fuel Dock



South Beach Marina



South Beach Marina



Gull Point Marina



Baynard Cove Community Docks