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IDENTIFICATION AND EXAMINATION OF DREDGED MATERIAL MANAGEMENT ALTERNATIVES

South Island Dredging Association

Hilton Head Island, South Carolina

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1.0 SUMMARY

The South Island Dredging Association (SIDA) is again seeking permits for maintenance dredging of waterways in Sea Pines on Hilton Head Island. The waterways are Harbour Town Yacht Basin (HTYB), Braddock Creek and Baynard Creek. These waterways include South Beach Marina, Gull Point Marina, and community and residential docks in both creeks. Collectively the waterways are referred to as Sea Pines Waterways. See Figure 1. In 1998 certain residential and business citizens of Sea Pines formed SIDA to restore and preserve the Sea Pines Waterways.¹ In June 2000 SIDA filed applications with regulatory authorities to dredge hydraulically and dispose of the material by discharge into designated sites in Calibogue Sound, a disposal method known as Inland Open Water Disposal (IOWD.) The original developer of Sea Pines had not included in his development plan, nor at that time was he required to include, an upland confined disposal facility (CDF) for the Sea Pines Waterways. A CDF for the exclusive use of the Calibogue Cay property owners is located in Sea Pines, but is not available for other venues as discussed more fully below.

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 ATM's Alternatives Analysis is included as Appendix 1. Excerpts from ATM's Alternatives Analysis are included below, and the entire document is attached as Appendix I to provide a complete understanding of its contents.

¹SIDA is made up of people who live and work on or near these waterways. Its members are:

1. Harbour Town Boat Slip Owners Association
2. South Beach Marina LLC
3. Sea Pines South Beach Property Owners Association
4. Gull Point Owners Association Inc.
5. Baynard Property Owners Association.

As part of its previous testing and data gathering in 2000, SIDA conducted extensive testing of the material to be dredged. The tests found no elevated concentrations of chemical constituents of potential concern. GEL's testing in 2008 confirmed the earlier results. These findings are consistent with the fact that there is virtually no potentially water polluting industry in the area and none in Sea Pines. Furthermore, Sea Pines has a relatively low population density and is not highly urbanized.

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 and expensive. Because of the urgent need to dredge HTYB 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 further the non-toxic nature of the sediments. Based on the findings of these toxicological evaluations, a permit for use of the ODMDS was issued.

Dredging of HTYB was completed in 2003. Dredging the other waterways was discontinued before completion due to sediment loss from the barge that was to carry the dredged material to the ODMDS. As it turned out, there were and are no barges with bottom dumping capability that can transport hydraulically dredged material with high water content from these waterways without excessive material loss. As the permit holder, SIDA was responsible for the actions of its independent contractor even though it had no operational control over the dredge itself. Thus, a state regulatory agency 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. The asserted fines and related litigation were resolved by February 2008.

SIDA then began evaluating how to conclude the dredging it had started at Braddock and Baynard Creeks. Also, by 2008 Harbour Town needed to be dredged again. Given this situation, SIDA began to evaluate all potential dredge material disposal alternatives. This document reviews the identified alternatives and identifies the only "feasible" and "practicable" alternative under federal and state regulations.

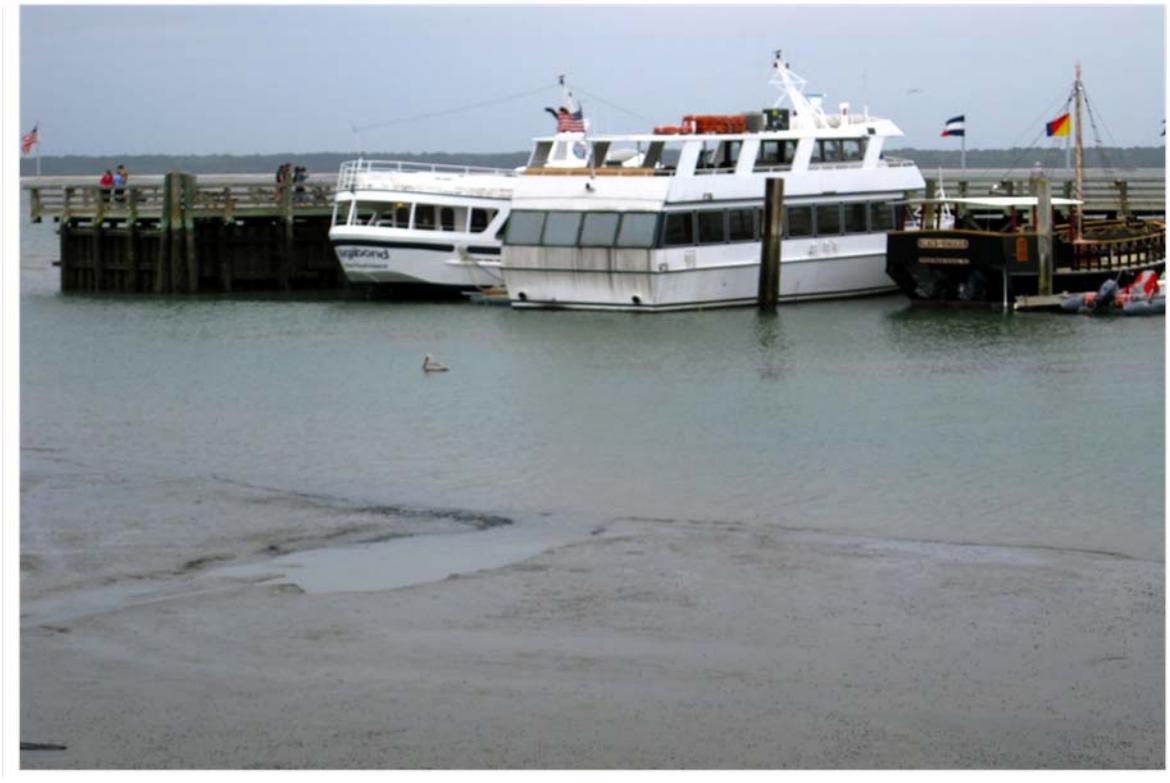
But, before turning to these matters it is important to make two observations from SIDA's earlier experience:

1. The attempt to transport the hydraulically dredged material from the Sea Pines Waterways by bottom dumping barge proved impossible. These barges cannot contain the hydraulically dredged material without excessive leakage; and
2. Although no specific scientific tests were performed to determine if there was any environmental damage from the 2003 discharges into Calibogue Sound, there has not been a single reported finding of any such damage in the intervening 9 years.

2.0 NEED TO RESTORE SEA PINES WATERWAYS

2.1 Photos at Low Tide

The following photos, taken within the past year, show the urgent need to restore the Sea Pines Waterways:



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



Harbour Town Yacht Basin – North End of Fuel Dock



Harbour Town Yacht Basin – South Side of Entry

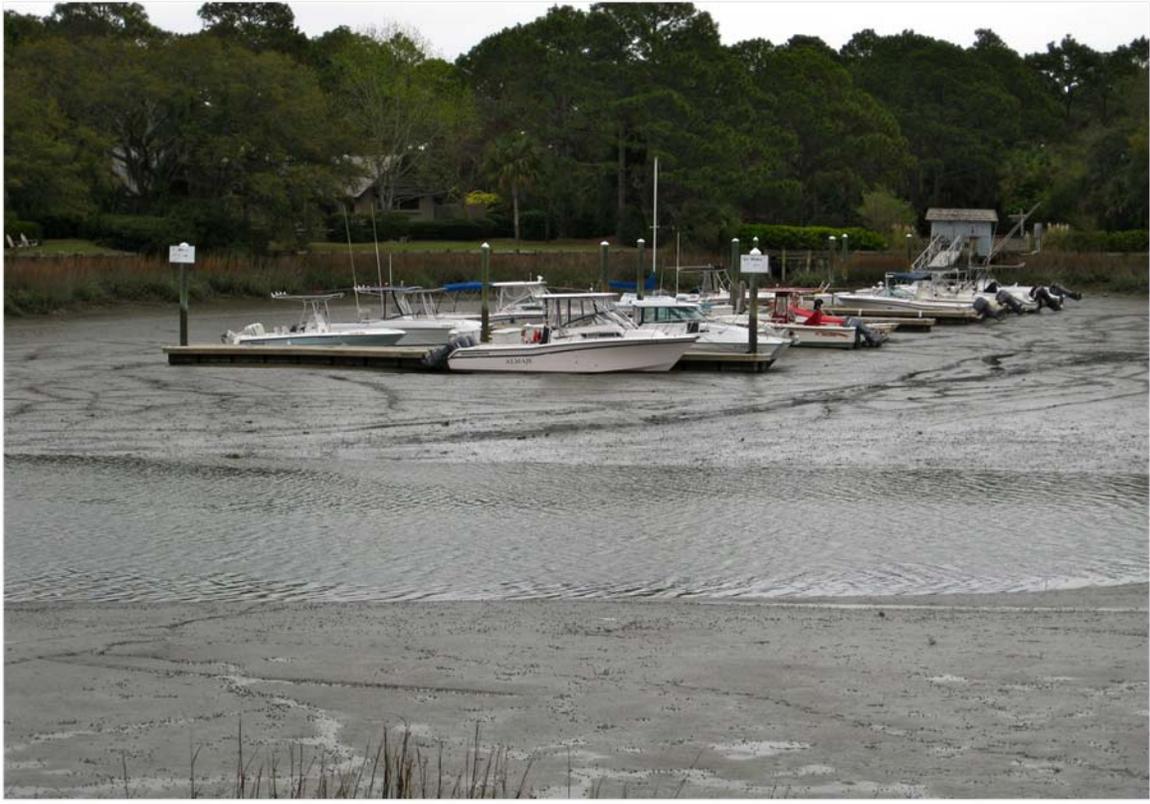


South Beach Marina





South Beach Marina



Gull Point Marina



Baynard Cove Community Docks

2.2 Adverse Consequences if Waterways Not Restored

If the waterways are not restored soon there will be several adverse consequences:

1. Tourism at Harbour Town and South Beach Village will decline dramatically as the water-oriented ambiance deteriorates.²
2. Home values throughout Sea Pines, from Harbour Town to Atlantic Pointe to Club Course, will decline significantly according to respected Hilton Head realtors.
3. The Heritage Golf Tournament risks losing its newly acquired sponsor if the television views of Harbour Town Yacht Basin become increasingly unappealing. Visitors to the 2010 tournament spent nearly \$82 million according to the study by Clemson's International Institute for Tourism Research and Development. Losing the tournament obviously would be a significant financial setback for Sea Pines, Hilton Head, Beaufort County and, indeed, all of South Carolina.

² Attached as Exhibit A is a description of the economic impact if the Sea Pines Waterways are not restored, including a letter of concern from Steve Wilmot, Tournament Director for the RBC Heritage Presented by Boeing.

4. South Carolina will lose significant tax revenue from Hilton Head that now supports services throughout Beaufort County and other parts of the State.
5. Sea Pines will lose the water-oriented activities it has enjoyed since being founded.

3.0 SIDA's Plan for Dredging and Disposal

Based on the evaluation of alternatives discussed herein, SIDA, its consultants and others who conducted an independent analysis determined that IOWD is the only feasible and practicable dredge alternative. Figure 1 shows the areas planned for dredging. These include:

1. Harbour Town Yacht Basin and entrance channel;
2. Braddock Creek including Gull Point Marina, South Beach Marina, Port Villas, the connecting creek and entrance channel; and
3. Baynard Creek entrance channel, Community Dock, and connecting creek up to the Community Dock and extending approximately 375 feet above the Community Dock entrance channel.

This foot print is smaller than the previously permitted dredge footprint since the portion of Baynard Creek above the Community Dock has been eliminated except for the first 375 feet. This modification represents an approximately 3,400 foot reduction in the length of Baynard Creek channel to be dredged (see hydrographic survey in Appendix 2). The areas removed from this application are significantly naturalized and dredging would cause unavoidable impacts to oyster reefs and vegetation.

Dredge depths are planned for 8 feet below mean low water (MLW) except for 6 feet MLW at the Community Dock and areas upcreek of South Beach Marina. These areas will generate approximately 300,000 cubic yards of sediment. The dredge areas do not include oyster reefs or marsh vegetation except near the entrance channel of Braddock Creek where a localized area of marsh vegetation will be impacted as more fully described in the "Biological Assessment for Maintenance Dredging and Disposal at Hilton Head Island, South Carolina" and "Essential Fish Habitat Assessment for Maintenance Dredging and Disposal at Hilton Head Island, South Carolina" (collectively BA/EFH Reports) dated September, 2012. Otherwise, the dredge areas will remain at least 10 feet from areas of established wetland vegetation and oyster reefs.

Dredging will be performed using a standard hydraulic cutterhead dredge. Dredging is planned for the period from November 1 through April 30 which the BA/EFH Reports document as an appropriate period of lower biological activity. Dredging may be conducted up to 24 hours per day. The dredged sediment will be pumped via pipeline to the IOWD location shown on Figure 2, designated as 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 as described in the BA/EFH Reports.

The Site 5 disposal location is in 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, shown on Figure 3. 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 concerns were expressed by the public about potential impacts to the May and Cooper Rivers. Although the modeling conducted at the time indicated that there would be no affects 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 (Figures 4 and 5). As described in the BA/EFH Reports, this area is characterized by relatively low biological diversity. Furthermore, the modeled deposition pattern shows that most of the sediments will initially remain in this environment, conservatively covering up to 56 acres as shown by the “Dredge Discharge and Bottom Deposition Analysis for Maintenance Dredging and Disposal at Hilton Head Island, South Carolina” (Modeling Report) dated September 2012. Following placement, the sediments will disperse over a period of days to weeks based on the currents present in this location. 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 returned to the natural system from which they originated. The Modeling and BA/EFH Reports document the areas of impact and that these impacts will be minimal and temporary.

The sediment will be discharged from the pipeline at a height approximately 3 feet above the bottom using a bottom tremie pipe to diffuse the discharge and reduce velocity. 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 minimum impacts to water quality as documented by the Modeling Report. This report shows that the plume of elevated turbidity will be localized to the discharge area and depths near the bottom, as shown by Figures 6 through 9. No increase in total suspended solids will be observable at the water surface.

Monitoring will be conducted prior to, during, and following dredging to determine actual effects of IOWD at this location. Monitoring will include a pre-dredge hydrographic survey, documentation of the bottom biota, and documentation of water quality parameters. These same data will be gathered during the dredging, and at periodic intervals following dredging. 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 accuracy of the predicted effects.

4.0 LAWS, REGULATIONS AND GUIDELINES

The laws, regulations and guidelines controlling review of SIDA's applications are the same as existed in 2000. They are explained clearly and comprehensively in ATM's Alternatives Analysis at pp. 1-2 and 8-9. For the sake of brevity and because they provide the controlling criteria we will discuss here only the operative language of the federal guidelines, including the "Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. - Testing Manual," (Inland Testing Manual) and state regulations.

Section 404(b)(1) of the Clean Water Act provides guidelines (the 404 Guidelines), the scope of which is summarized as follows:

"The guidelines are applicable to the specification of disposal sites for the discharges of dredged or fill material into the waters of the United States. Sites may be specified through... (1) The regulatory program of the U.S. Army Corps of Engineers under sections 404(a) and (e) of the Act... ."

40 CFR §230.10

Specified disposal sites must be "practicable"

...the only alternatives which must be considered are practicable alternatives. What is **practicable depends on cost, technical, and logistic factors**... Our intent is to consider those alternatives which are reasonable in terms of the overall scope/cost of the proposed project... If an alleged alternative is unreasonably expensive to the applicant, the alternative is not "practicable"... it must be reasonably available or obtainable. However, the mere fact of ownership or lack thereof, does not necessarily determine reasonable availability." (Emphasis supplied)

40 CFR Part 230.10

South Carolina's OCRM Regulations are consistent with the 404 Guidelines. The OCRM Regulations use the word "feasible" whereas the 404 Guidelines use "practicable." The critical state regulation is R.30-12.1(2)(b) which states:

"Open water and deep-water disposal should be considered as an alternative if highland alternatives are not feasible."

Feasible is defined at R.30-1.D(23) as follows:

“Feasible (feasibility) - As used within these rules and regulations (e.g., "unless no feasible alternative exists"), feasibility is determined by the Department with respect to individual project proposals. Feasibility in each case is based on the best available information, including, but not limited to, technical input from relevant agencies with expertise in the subject area, and **consideration of factors of environmental, economic, social, legal and technological suitability of the proposed activity and its alternatives. Use of this word includes, but is not limited to, the concept of reasonableness** and likelihood of success in achieving the project goal or purpose. "Feasible alternatives" applies both to locations or sites and to methods of design or construction, and includes a "no action" alternative.”
(Emphasis supplied.)

The Inland Testing Manual was produced jointly by the USEPA and USACE. It provides the specific protocol for assessing the propriety of IOWD for any dredging project. Its applicability here is compelled because both the federal Guidelines and South Carolina’s regulations use virtually the same standards for evaluating IOWD.

5.0 EXCERPTS FROM ATM ALTERNATIVES ANALYSIS

The following excerpts from the ATM Alternatives Analysis show that when ATM conducted its investigation and analysis it reached the same conclusions as are reached in the current alternatives analysis; namely, that (i) there are no upland sites for the Sea Pines Waterways, (ii) IOWD will not cause unacceptable adverse effects to Calibogue Sound, and (iii) hydraulic dredging with IOWD is the only practicable and feasible alternative.

5.1 Excerpts from ATM Summary

“The Applicant has considered and reviewed all potential sites located within a reasonable geographical area surrounding the sites to be permitted under this application. The Calibogue Cay POA has determined that the use of their CDF by any SIDA members for even a portion of the material requiring management would reduce the overall capacity of the site for the future management of Calibogue Cay dredged material and will therefore not consider amending the covenant restrictions to permit this use. The Lawton Stables Tract is not available as an alternative to any SIDA member for the reasons discussed above for any portion of member dredged material needs. There are no other upland properties of sufficient size that are available to SIDA members for new site development.³ As discussed above, potential upland sites located on neighboring islands are not available due to refusals by the owner.

The ATM studies reasonably and soundly conclude that there will not be any unacceptable adverse effects to the waters of Calibogue Sound, or to the marine and vegetation life in Calibogue Sound, if SIDA members are granted a permit to dispose of their dredge materials into these 404 waters. SIDA submits that it has fully complied with all requirements of Section 404(b)(1) of the Clean Water Act, the Inland Testing Manual, and applicable OCRM Regulations, and is fully qualified to receive the permit in accordance with its pending application.

³ See the following six letters in ATM’s Appendix for documentation that the Calibogue Cay and Forest Preserve sites are not available for dredge material from the Sea Pines Waterways:

CSA SIDA/Richard Sonberg July 1, 2000
Sea Pines Company/Thomas Norby SIDA/Richard Sonberg August 14, 2000
CSA ATM/W. Samuel Phlegar March 26, 1999
Calibogue Cay/Robert M. Willock SIDA/Richard Sonberg June 30, 1999
Calibogue Cay/Robert M. Willock SIDA/Richard Sonberg May 10, 2000
Vaux & Marscher/William Marscher SIDA/Richard Sonberg June 22, 2000

To deny this application will result in continuing accumulation of silt materials in the proposed sites, such that required navigation would not be possible except on the very high tide periods, which is contrary to the public interest and would be violative of the standards established in applicable federal and state laws, rules and regulations.”

ATM Alternatives Analysis at pp. 39-40.

5.2 Excerpts from ATM Final Conclusion

“One must conclude that [IOWD is the only alternative and that] SIDA does not have any other practicable or feasible disposal site available, applying the regulatory definitions that are applicable to this application.

The scientific studies also require a determination that the placement operation can be conducted and the site managed so that there will not be any unacceptable adverse effects to the waters and marine environment if the permit is granted and the project is implemented.”

ATM Alternatives Analysis at p. 41.

6.0 UPDATE OF ATM'S ALTERNATIVES ANALYSIS

6.1 Solicitation of Bids in 2008

After SIDA and the regulatory authorities reached agreement to dismiss the various claims from the earlier dredge, SIDA retained GEL Engineering, LLC (GEL) to assist in resuming the effort to restore the Sea Pines Waterways. In September 2008 GEL conducted a hydrographic survey of the areas. A copy of GEL's survey is attached as Appendix 2. Shortly thereafter, GEL and SIDA prepared a bid package that was sent to various dredge contractors on the east coast of the United States. Several companies responded with proposals for performing mechanical dredging with offshore ocean disposal or with hydraulic dredging and disposal at an upland site, assuming one could be found. No contractor, however, made a proposal for hydraulic dredging with offshore ocean disposal. SIDA then learned from the contractors that the reason none submitted proposals for that was because they became convinced there was no bottom dumping barge, which is required for disposal at an offshore ODMDS, that could contain the hydraulically dredged pluff mud from the Sea Pines Waterways without excessive leakage. GEL later confirmed the contractors' conclusion in a letter dated June 17, 2010, from Norfolk Dredging Company stating that hydraulic dredging with disposal at an ODMDS is not suitable for technical and regulatory reasons. A copy of Norfolk Dredging Company's letter is attached as Exhibit B.

6.2 The Sea Pines Waterways Task Force

In February 2010 Community Services Associates, Inc. (CSA)⁴ formed a task force to conduct an independent evaluation of methods for restoring the Sea Pines Waterways. The Task Force Chairman was CSA's Executive Vice President, Cary Kelley.

After more than 18 months of study and consultation with engineers, regulators and other experts the Task Force unanimously adopted its final report on August 19, 2011 and submitted it to the Boards of Directors of CSA and Association of Sea Pines Plantation Property Owners (ASPPPO). The report concludes:

“Having considered the environmental, economic, social, legal and technological suitability of hydraulic dredging with open water disposal for the Sea Pines Waterways, the Task Force concludes that they are the only feasible methods for dredging the Sea Pines Waterways and that there are no feasible alternatives... .”

⁴ CSA owns and has responsibility for maintaining the common properties within Sea Pines, including roads, pathways, lagoons and more. CSA also provides security in Sea Pines through sworn officers of the law. Thus, CSA serves in many ways as a de facto local government for Sea Pines affairs.

A copy of the Final Report of The Sea Pines Waterways Task Force (without appendix exhibits) is attached as Exhibit C.

Having completed its work the Task Force was abolished. Subsequently, the Boards of Directors of CSA and ASPPPPO adopted a joint resolution in support of hydraulic dredging with IOWD disposal. They then sent copies to the governing bodies of Town of Hilton Head and Beaufort County. A copy of the joint resolution is attached as Exhibit D.

Over the course of its work the Task Force analyzed all methods for dredging the Sea Pines Waterways. The Task Force scoured the area for a CDF. The only one in Sea Pines is limited by covenant to material from Back Creek, adjacent to the Calibogue Cay neighborhood. The Task Force also examined building an upland site in Sea Pines, but could not find adequate available land including in the Forest Preserve.⁵ Further, the costs to build such a site would be considerable, estimated at several million dollars, and up to approximately 40 acres of mature maritime forest would have to be clear-cut, including filling of related freshwater wetlands.

The Task Force considered mechanical dredging with disposal at the ODMDS. The Task Force learned that, although possible, mechanical dredging is not well suited for work in creeks and around docks. It also creates more turbidity and habitat disturbance than hydraulic dredging and requires double handling of the sediment which increases the risk of spillage and misplacement. In addition, the bid proposals for mechanical dredging were exorbitant, ranging from more than \$46 per cubic yard (CY) to more than \$84 CY. This generates a cost range of approximately \$15 million to \$27 million for the Sea Pines Waterways.

The Task Force considered hydraulic dredging with techniques to dewater the dredged material and then haul it by truck to an appropriate disposal site. Two companies provided information for dewatering but neither could demonstrate that its method would perform satisfactorily and/or be affordable. Even if successful, costs for dewatering and trucking to an offsite disposal location were no less expensive than those for mechanical dredging. In addition, hauling the dewatered material by truck would require approximately 20,000 trips by 15 cy dump trucks. The noise, traffic, wear on roads, and fuel emissions from the trucks would itself create an unacceptable environmental impact for the residents of our area.

⁵ The owner of the Sea Pines Forest Preserve, Sea Pines Resort, provided the Task Force a letter explaining that no portion of the Forest Preserve would be available for a CDF. A copy of that letter is attached as Exhibit E.

The Task Force also evaluated using geotextile bags for disposal but discovered that this method is used for smaller projects, has not been consistently successful with fine grained sediments, and would not be appropriate for this application.

7.0 ADDITIONAL INFORMATION ON DREDGING AND DISPOSAL METHODS

A more detailed discussion of certain of the methods the Task Force considered follows.

7.1 Confined Disposal Facilities in Sea Pines

As stated earlier, there are no confined disposal facilities in Sea Pines except for the Calibogue Cay CDF. It 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. Nevertheless, CSA commissioned a detailed study in 2011 to determine how much sediment the Calibogue Cay CDF could accommodate and under what conditions. The “Calibogue Cay Confined Disposal Facility Capacity Analysis” (Appendix 3) evaluated multiple scenarios and determined that the CDF could accommodate sediment from Harbour Town in addition to Calibogue Cay, but would require emptying routinely. The Harbour Town Slip Owners Association asked the Calibogue Cay property owners to allow use (even on a one-time basis) of the CDF. The Calibogue Cay property owners voted down the request as documented in an e-mail from the President of Calibogue Cay Property Owners Association. A copy of his email to the representative of the Harbour Town Slip Owners Association is attached as Exhibit F.

7.2 Building a CDF in Other Sea Pines Locations

ATM’s Alternatives Analysis had examined several other potential sites in Sea Pines for construction of a CDF: Lawton Stables at pp. 12-13, a small parcel just south of Baynard Creek called Egret Island at p. 15, and the Forest Preserve at pp. 15-16. None of these locations was found available or practicable for the reasons stated in ATM’s Alternative Analysis. Nothing has changed. See letter dated June 8, 2012 from Cary Kelley, Executive Vice President, CSA to Thomas Hutto, GEL Engineering attached as Exhibit G.

7.3 Building a CDF Outside Sea Pines

GEL evaluated areas near Sea Pines to identify potential locations to build a CDF. The only even remotely potential location identified was a parcel on Daufuskie Island (Figure 10). Daufuskie is a barrier island accessible only by boat. This location, which is characterized by mature maritime forest and wetlands, was evaluated. Soils of the site were found to be sandy and unsuitable for construction of dikes. Discussions with island contractors determined that similar soil is present throughout Daufuskie. 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 at pp. 16-18 had 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. In addition to the reasons described by ATM, use of any of these sites would require significant expenditure for construction of a CDF as well as significant additional costs for emptying the site by barge after drying.

7.4 Mechanical Dredging and Transportation to the ODMDS

Mechanical dredging requires multiple handling of the dredge material increasing likelihood for spillage or leakage, 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.

As stated previously, SIDA solicited and received bids in 2008 for dredging the Sea Pines Waterways. Companies submitted bids to perform: (i) mechanical dredging with disposal at the ODMDS, and (ii) hydraulic dredging to an upland site, assuming one was available. No contractor submitted a bid for hydraulic dredging with disposal at the ODMDS because they then knew that no bottom-dumping barge could contain Sea Pines' hydraulically dredged pluff mud. Two companies submitted bids to SIDA for combining mechanical dredging with disposal at the ODMDS: (i) Jay Cashman, Inc., a large dredging contractor from Massachusetts, and (ii) Orion Marine Group, a large marine service company with offices on the southeast, Gulf and west coasts. Cashman bid \$46.50/cy for all areas assuming there would be 349,675 CY. If Cashman would apply that rate to 300,000 CY Cashman's total price would be approximately \$14 million. Cashman's bid for Harbour Town alone was \$57.30 CY or \$3.75 million.⁶ Orion Marine Group bid only on Harbour Town and the rate was \$84.25 CY or a total for Harbour Town of just under \$5.5 million.

7.5 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 inland open water disposal. It is the only feasible and practicable alternative for dredging the Sea Pines Waterways. It is the only alternative that is affordable for SIDA's members or, indeed, for the entire Sea Pines community. With certain qualifications, including fuel cost adjustments for rising gas prices, Marcol Dredging Company from North Charleston submitted a bid in June 2010 for approximately \$9

⁶ The actual costs for dredging now will likely be higher due to the rise in fuel costs and other factors.

CY for hydraulic dredging with inland open water disposal. A copy of Marcol's bid is attached as Exhibit H. Considering increased fuel costs, the expected bid today could be about \$10 CY for a total cost of approximately \$3 million.

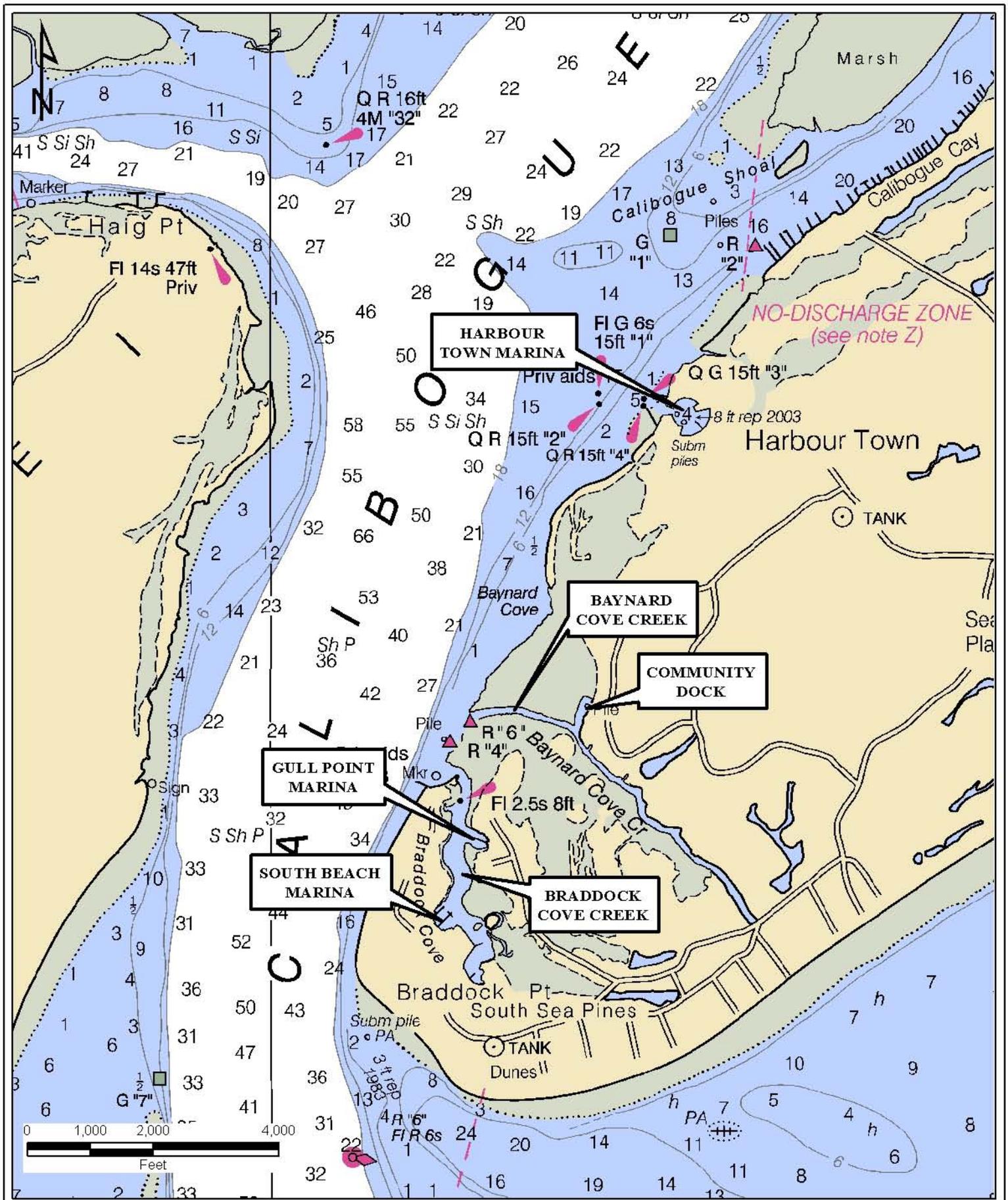
In January 2012 Moffatt & Nichol provided SIDA an approximate calculation of a budget for hydraulic dredging with IOWD. The estimate did not consider specific local or regional dredging market conditions, environmental constraints effecting costs, nor did the budget estimate consider potential additional costs for items that will ultimately be required, such as a booster pump, submerged discharge, and around the clock inspectors. Nevertheless, this estimate showed that other reputable and experienced dredge contractors would probably bid in the same range as Marcol's bid. See Exhibit I.

8.0 CONCLUSIONS

The only feasible and practicable alternative to restore the Sea Pines Waterways is by hydraulic dredging with inland open water disposal. There is no available upland site. Mechanical dredging will not work well in the areas to be restored, requires multiple handling of the material, and its costs are exorbitant. Hydraulic dredging with disposal at an off shore disposal site is not possible due to excess leakage of Sea Pines pluff mud from the required bottom dumping barge.

Since the state regulatory standard is essentially the same as the federal standard (The Clean Water Act 404(b)(1) Guidelines) for inland open water disposal the issue becomes whether SIDA's plan meets the standards and protocol of The Inland Testing Manual pursuant to the Clean Water Act 404(b)(1) Guidelines. As this analysis and the other test results and data demonstrate, SIDA's plan meets or exceeds the specified standards and will not result in unacceptable adverse impacts to Waters of the United States. Accordingly, the permits for which SIDA has applied to restore the Sea Pines Waterways should be issued.

FIGURES



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PROJECT: SIDA00111
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 MATERIALS MANAGEMENT ALTERNATIVES
 SOUTH ISLAND DREDGING ASSOCIATION
 HILTON HEAD, SOUTH CAROLINA

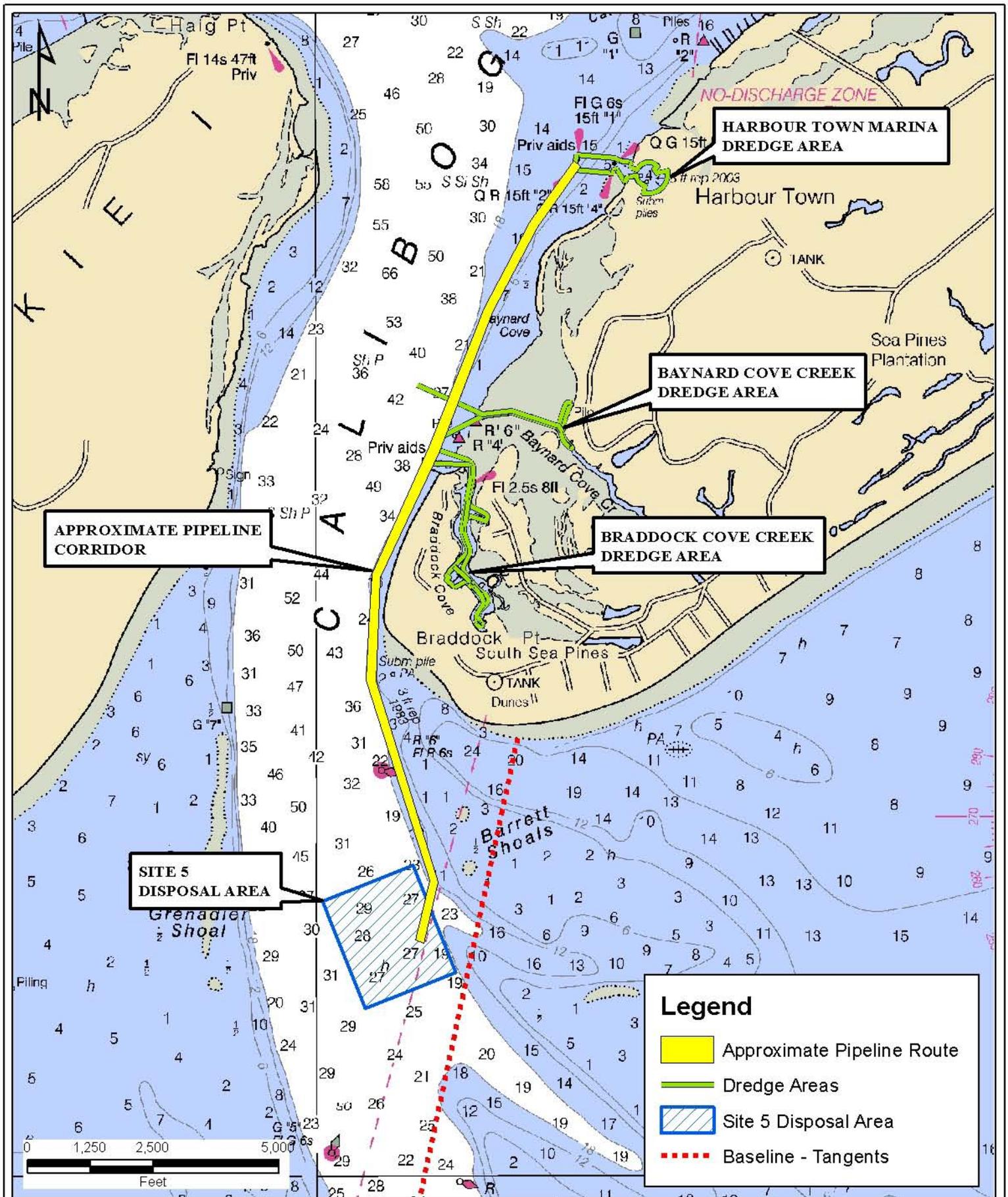
SITE LOCATION MAP
 SHOWING AREAS
 TO BE DREDGED

FIGURE
 1

DATE: JULY 3, 2012

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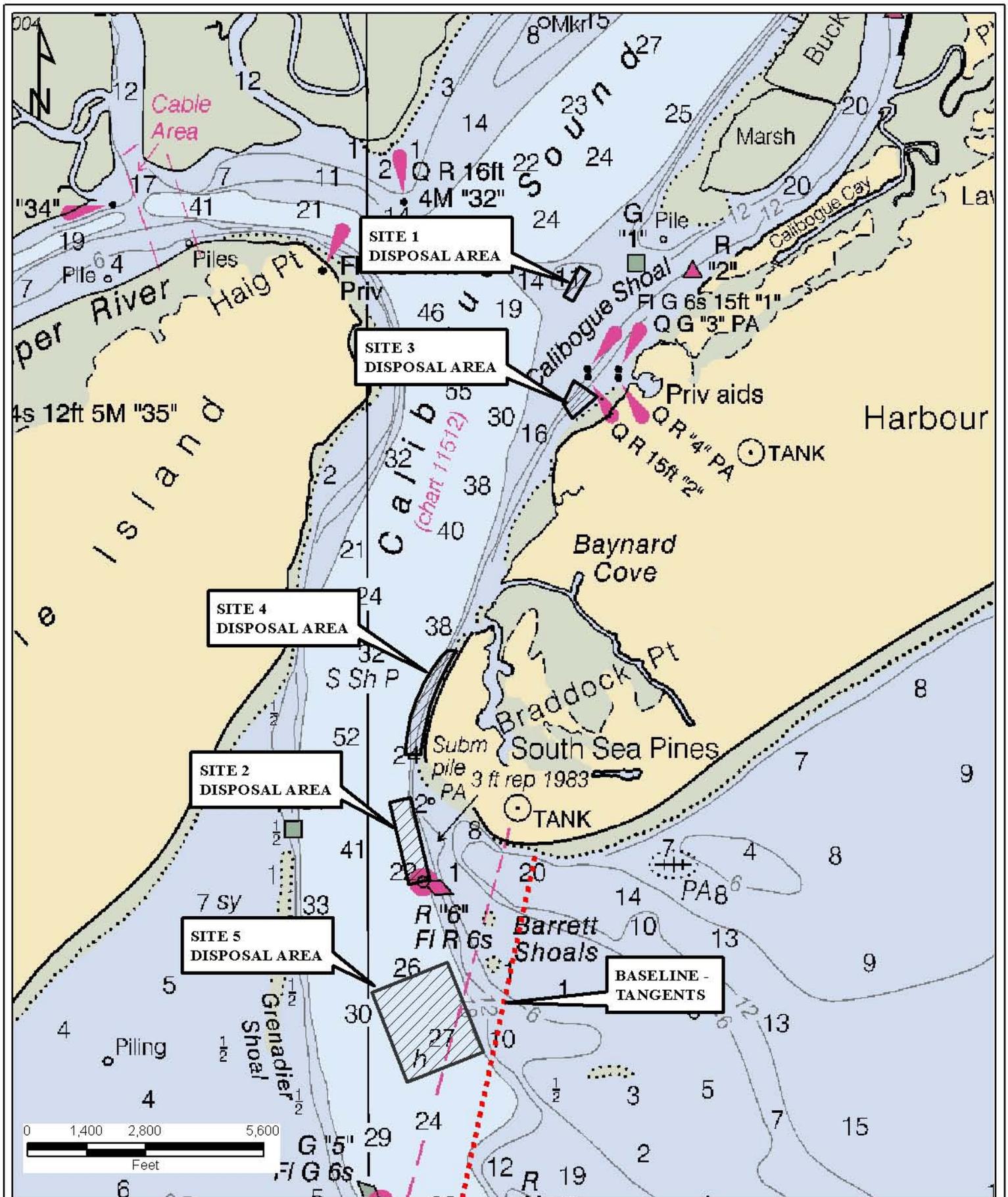
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MAP SHOWING
 DISPOSAL SITE 5

FIGURE
 2

DATE: JULY 3, 2012

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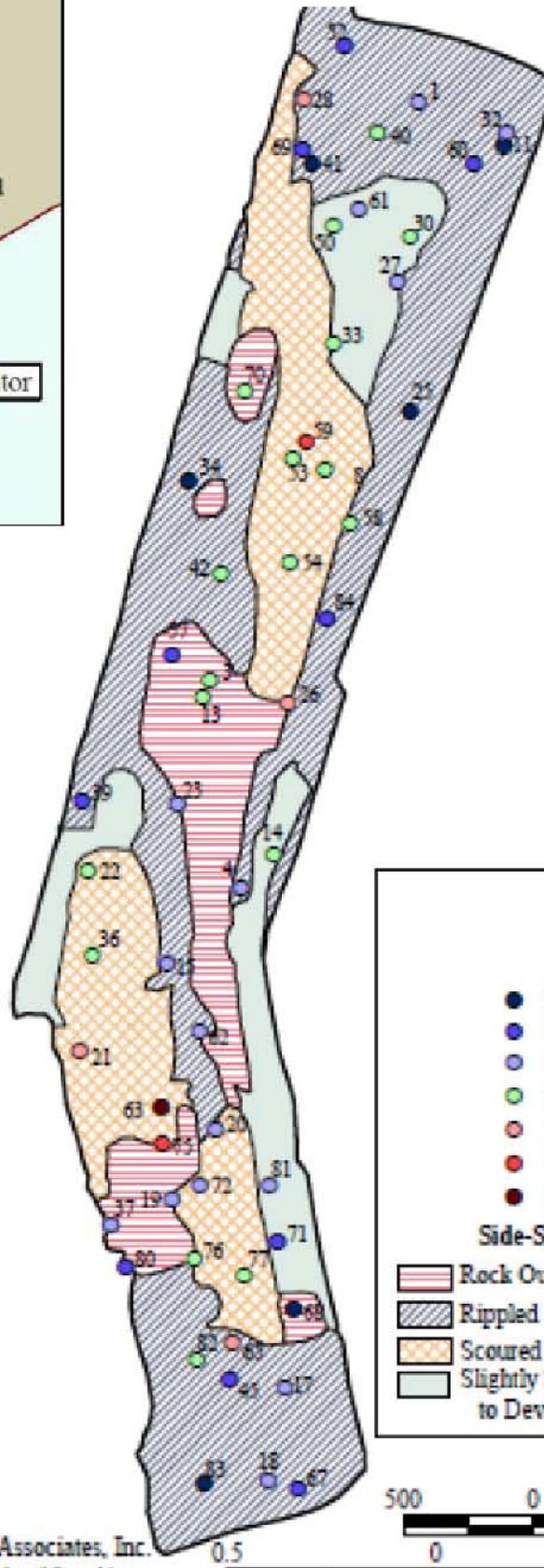
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 DATE: JULY 3, 2012

MAP SHOWING
 DISPOSAL SITES 1-5

FIGURE
 3

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Legend

Density (no/m²)

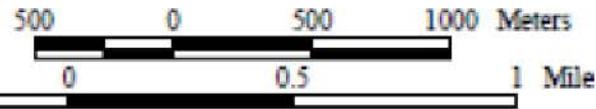
- 0 - 500
- 501 - 1,000
- 1,001 - 2,000
- 2,001 - 5,000
- 5,001 - 10,000
- 10,001 - 20,000
- Greater Than 20,000

Side-Scan Sonar Bottom Types

- ▨ Rock Outcrops
- ▨ Rippled Sand
- ▨ Scoured Depression Exposing Hardbottom
- ▨ Slightly Sandy but Insufficient Sand to Develop Biforms



Barry A. Vittor & Associates, Inc.
Environmental Research and Consulting



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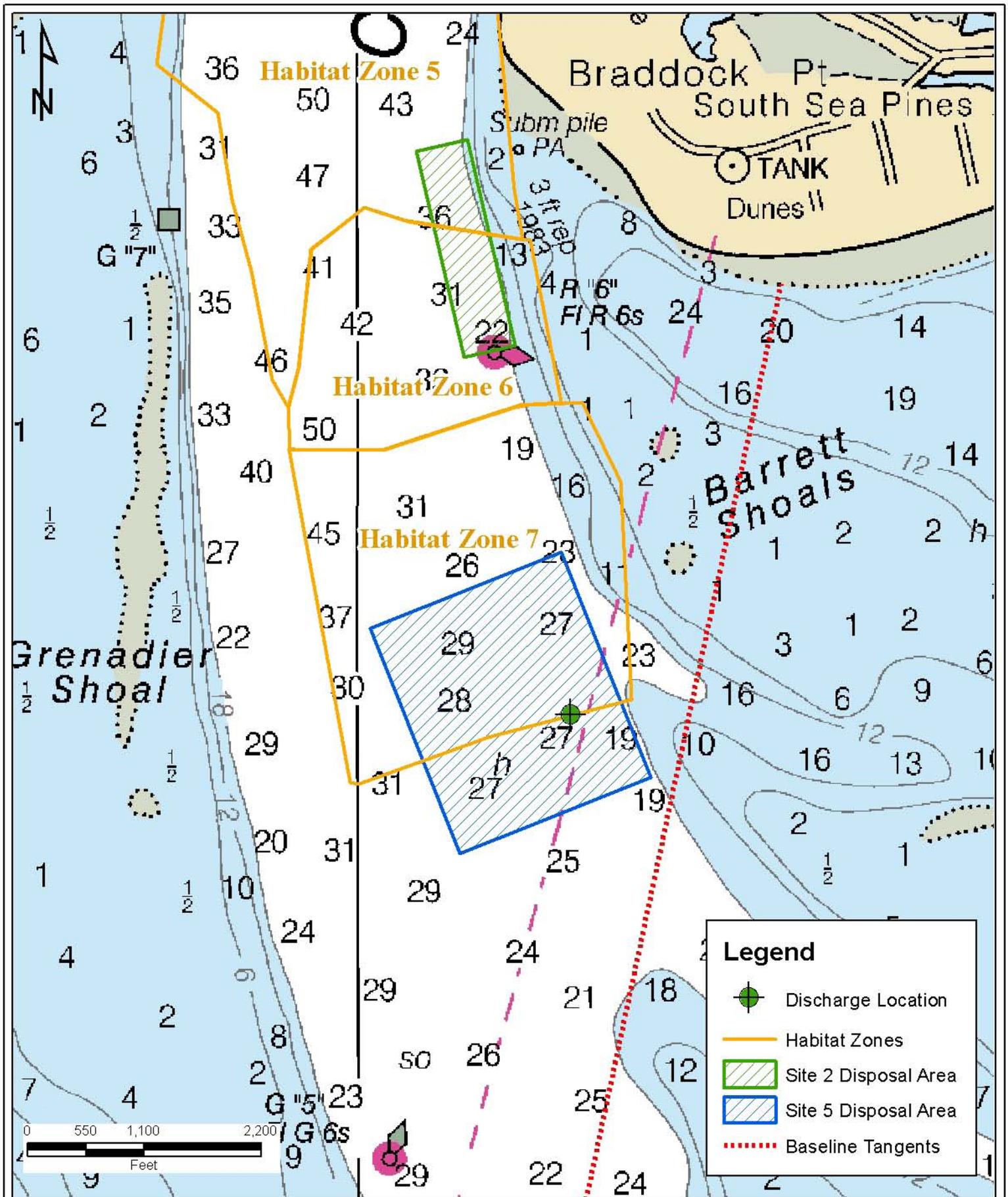
BENTHIC HABITAT SAMPLING MAP
SHOWING BOTTOM TYPES

FIGURE
4

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SITES 2 AND 5 SHOWN RELATIVE
 TO HABITAT ZONES

FIGURE
 5

DATE: JULY 3, 2012

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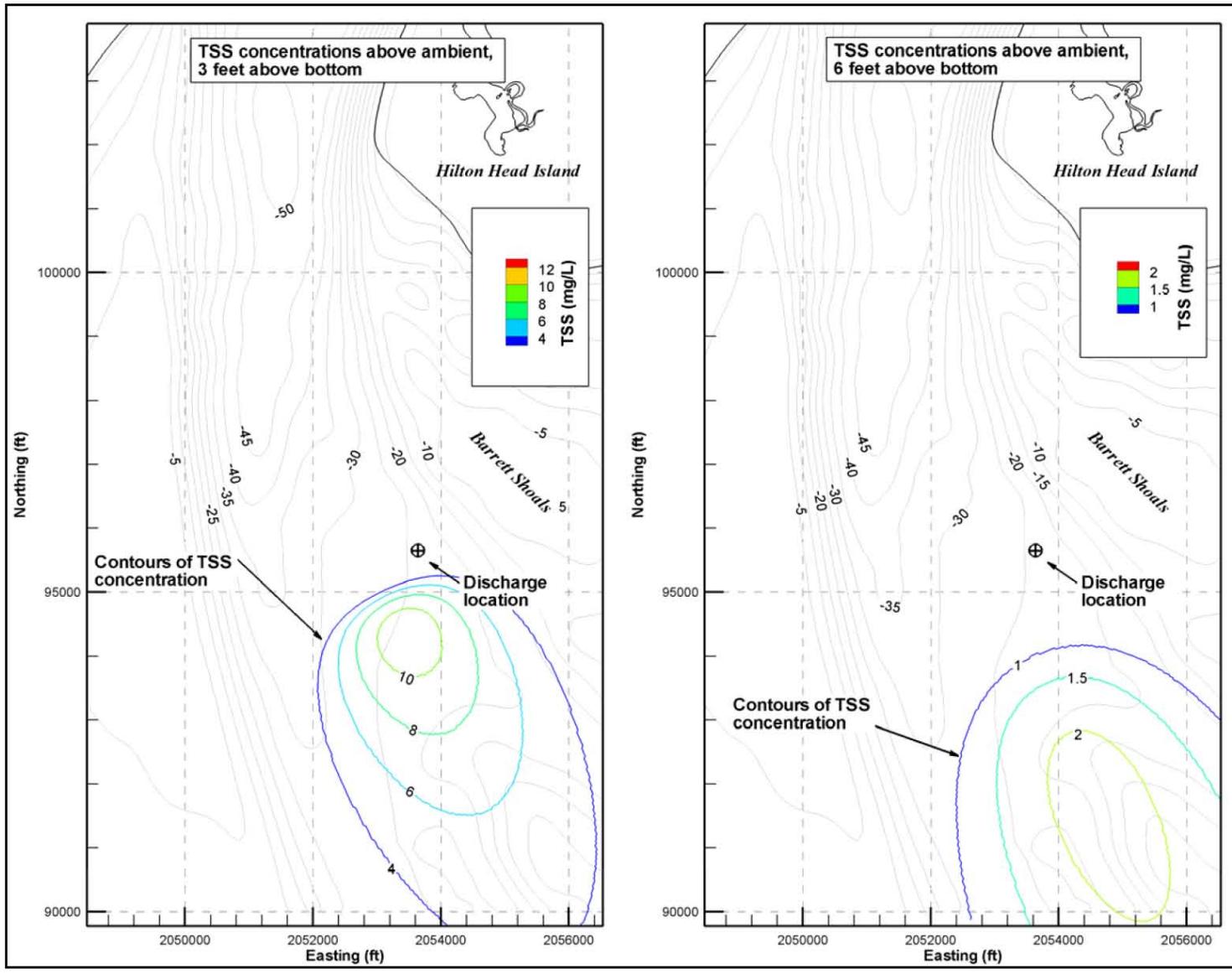


Figure 6. Predicted suspended sediment concentrations during peak ebb current conditions, 3 feet and 6 feet above the bottom



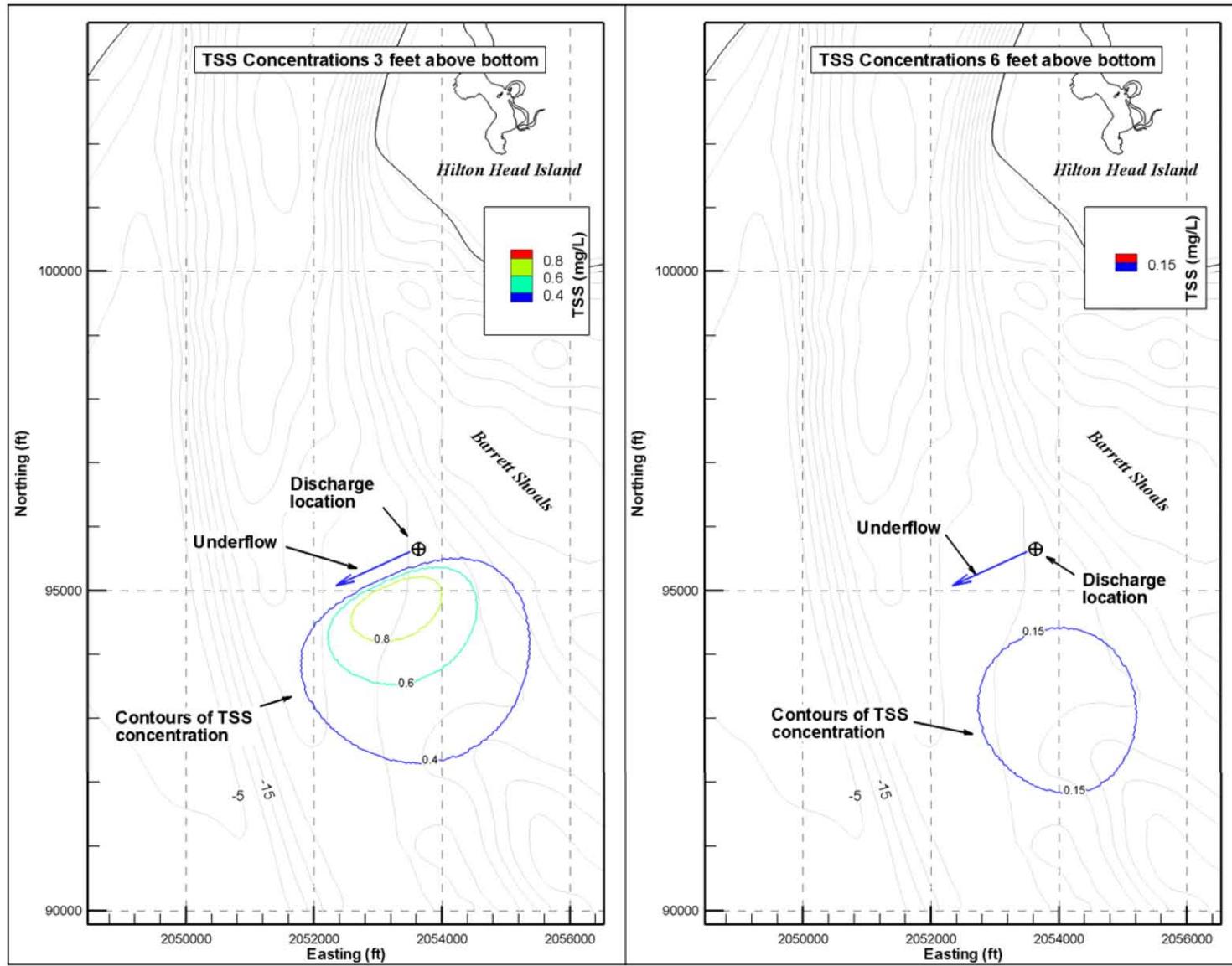


Figure 7. Predicted suspended sediment concentrations during half peak ebb current conditions, 3 feet and 6 feet above the bottom.

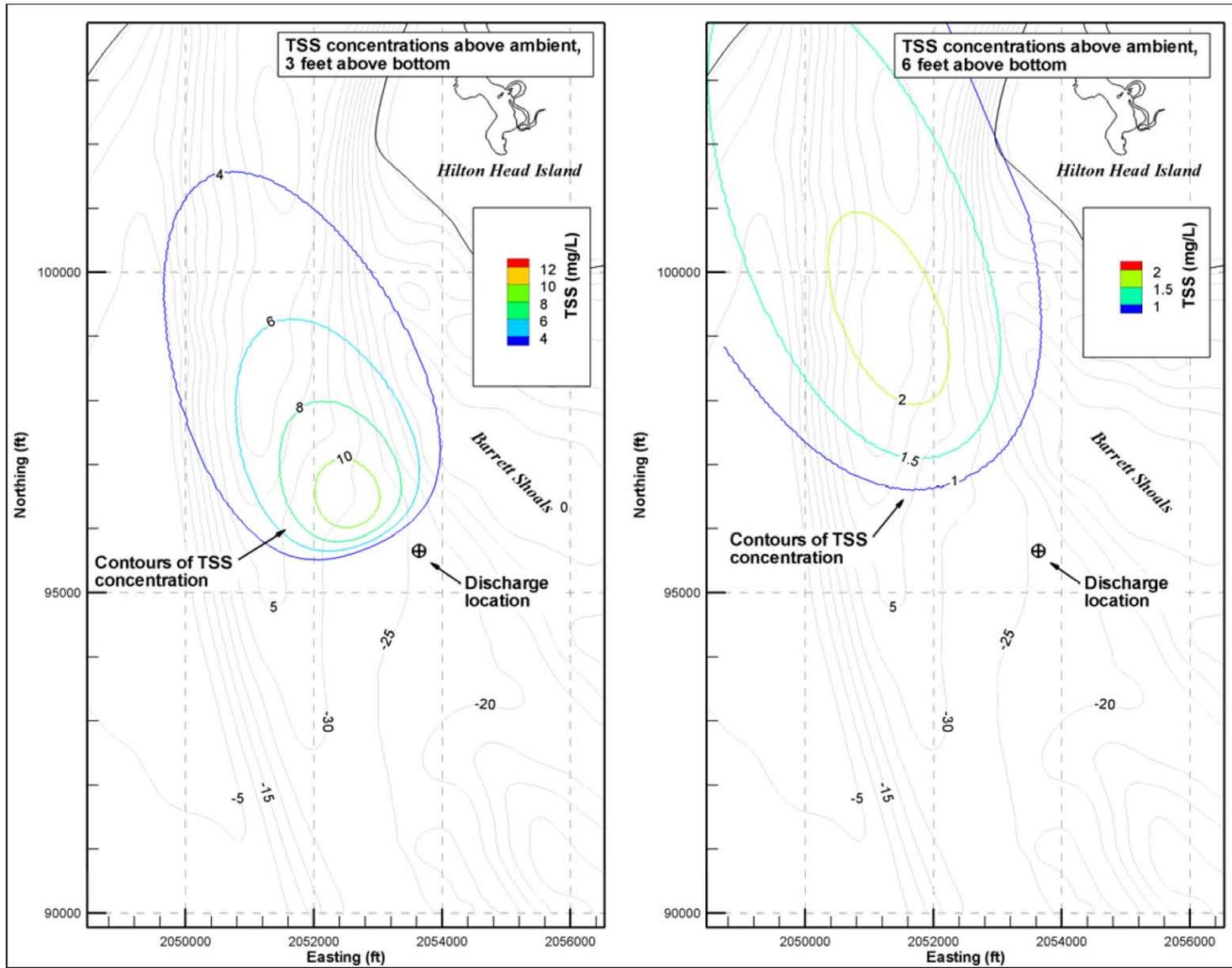


Figure 8. Predicted suspended sediment concentrations during peak flood current conditions, 3 feet and 6 feet above the bottom.

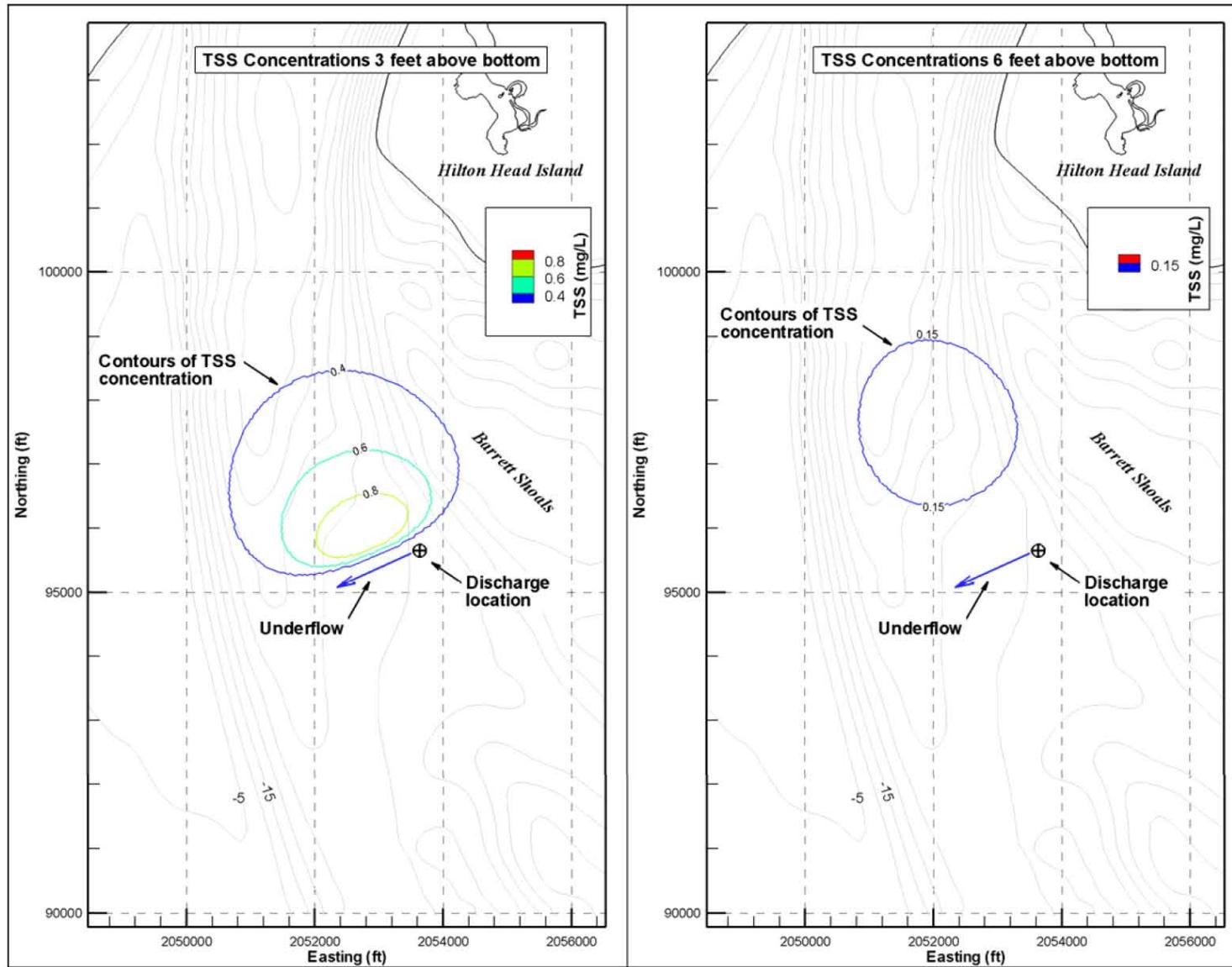
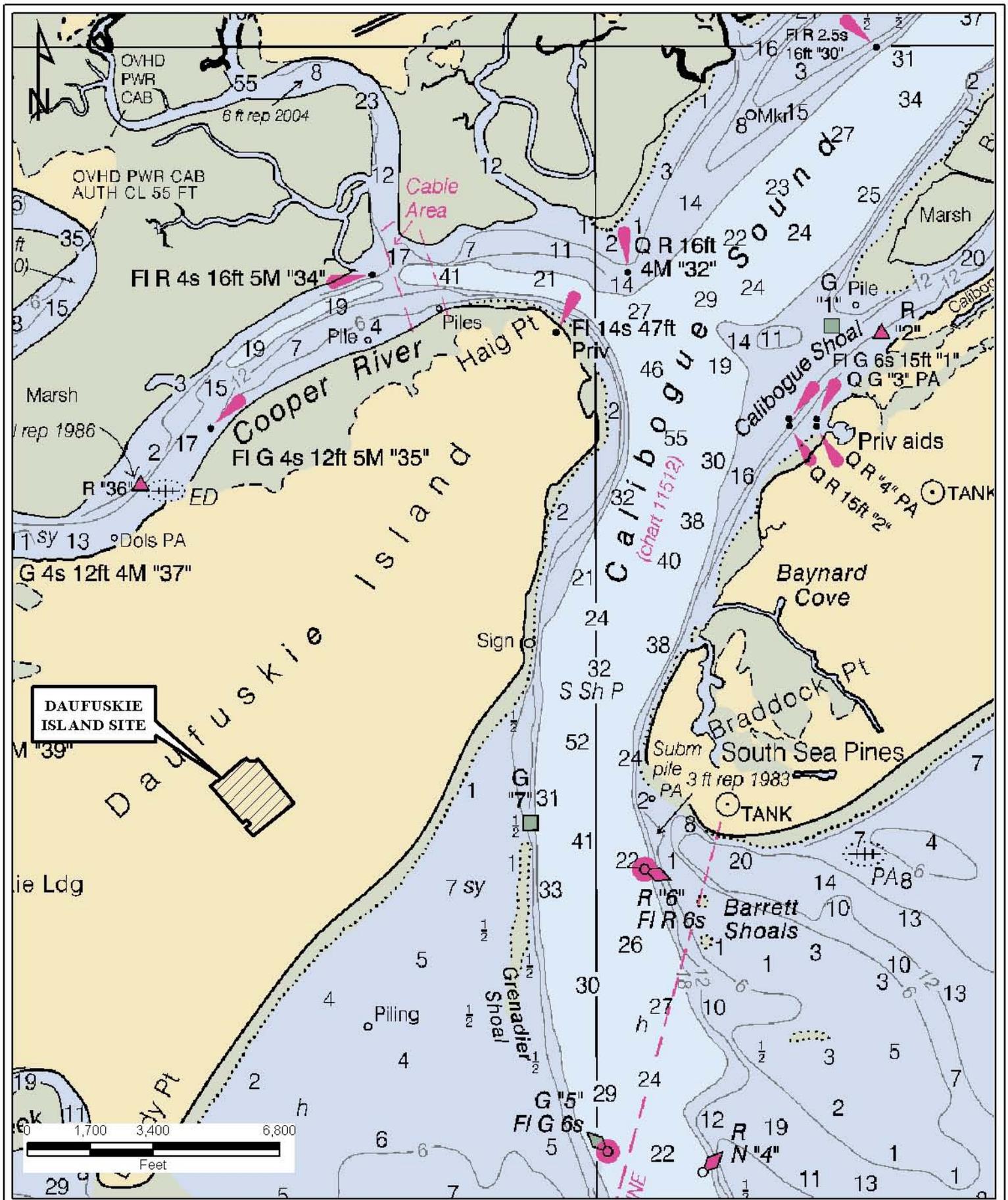


Figure 9. Predicted suspended sediment concentrations during half peak flood current conditions, 3 feet and 6 feet above the bottom.



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 SOUTH ISLAND DREDGING ASSOCIATION
 HILTON HEAD, SOUTH CAROLINA
 DATE: JULY 3, 2012

DAUFUSKIE ISLAND SITE
 EVALUATED FOR A CDF
 CREATED BY: RCR APPRV BY: TDH

FIGURE
 10

APPENDICES

APPENDIX I

Identification and Examination of Practicable Dredged Material Management Alternatives, ATM

Identification and Examination of Practicable Dredged Material Management Alternatives

Task 1 Final Document

PREPARED BY:

**APPLIED TECHNOLOGY AND MANAGEMENT, INC.
CHARLESTON, SC**

PREPARED FOR:

SOUTH ISLAND DREDGING ASSOCIATION

FINAL: AUGUST 18, 2000

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Identification and Examination of Practicable Dredged Material Management Alternatives

Task 1 Final Document

INTRODUCTION

The Applicant (South Island Dredging Association, herein "SIDA") represents member organizations that require immediate dredging of the tidal creeks and basins within their geographical areas in order to restore reasonable navigability to those waters and bring them back to design grade. Presently these facilities are not navigable over much of each tidal cycle. This includes the following waterways inside Sea Pines Plantation, which is located on the southern one-third of Hilton Head Island, Beaufort County, South Carolina: Braddock Creek, Braddock Cove, and South Beach Marina; Gull Point Marina (located on the northeasterly side of Braddock Creek); Baynard Creek; and Harbour Town Yacht Basin. It is estimated that approximately 195,000 cubic yards of fined-grained material and up to 150,000 cubic yards of sandy profile nourishment-quality material must be removed from these waterways to bring the channels and basins back to reasonably navigable depths and widths.

This application is the result of over two years of study and review of the problems confronting SIDA's members. SIDA and its consultants have selected the open waters of Calibogue Sound for the discharge of the materials to be dredged from the areas to be permitted, because they have determined, after this exhaustive study, that Calibogue Sound is the only practicable, feasible disposal site for this project, and that there are not alternative sites reasonably available, either upland or offshore in the Atlantic Ocean.

It is the purpose of this section of the permit application to set forth the steps undertaken by the Applicant during its investigation of alternative disposal sites, and to demonstrate why Calibogue Sound is, in fact, the only practicable disposal site for the proposed dredge spoils discharge under this permit application.

APPLICABLE LAWS, RULES AND REGULATIONS

SIDA's alternative site analysis has been conducted under the purview of applicable federal and state laws, rules and regulations.

The principal federal law applicable to SIDA's site selection for this permit application is Section 404 of the Federal Water Pollution Control Act of 1972 (FWPCA), as amended by the Clean Water Act of 1977 (CWA).

The U.S. Army Corps of Engineers (USACE) and the Environmental Protection Agency (EPA) jointly developed and established procedures applicable to the evaluation of potential contaminant-related environmental impacts associated with the discharge of dredged material in inland waters, near coastal waters, and surrounding environs (that is, all waters in the United States jurisdiction other than the ocean and the territorial seas). These procedures are set forth in the "Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. - Testing Manual," commonly referred to as the "Inland Testing Manual" (and so identified herein).

Also, the EPA has promulgated "Guidelines" (so identified herein) as the substantive criteria to be used in evaluating discharges of dredged materials in Inland Waters (as regulated under Section 404 of the CWA). These Guidelines are affixed as Appendix "A" in the Inland Testing Manual, and published in 40 CFR Part 230.

The principal South Carolina (State) law applicable to the Applicant's site selection process for this permit application are the "OCRM Regulations" promulgated by the S.C. Department of Health and Environmental Control (SCDHEC), through its Office of Ocean and Coastal Resource Management (OCRM). Designated as DHEC Regulation 30, these rules and regulations are intended to implement the South Carolina Coastal Management Act of 1977. Inshore open water disposal of dredge materials is authorized under the OCRM regulations, although admittedly it is not the preferred method.

SIDA, in close and continuous consultation with its consultants, has spent in excess of two years identifying, studying and evaluating potential disposal sites for its dredge project. As noted below, industry/regulatory tradition has segregated disposal sites into three categories. SIDA's study involved a comprehensive review of potential sites within all three categories, with the specific goal of identifying the most practicable and feasible sites(s) for this dredge project.

All studies were conducted within the purview and specific requirements of the above-cited federal and state laws, rules and regulations and guidelines. Under the guidance of its consultants, Applied Technology and Management, Inc. (ATM), a review and discussion procedure was established with an interagency group comprised of representatives from all federal and state agencies who are interested in the dredge permitting process. Two years of frequent meetings and reporting kept the agency representatives fully apprised of the work being undertaken and completed by SIDA and its consultants. All participants in this process were allowed full opportunity to critique the Applicant's studies and reports, so that every reasonable alternative for spoils disposition could be thoroughly analyzed.

It is the conclusion of SIDA and its consultants, after this exhaustive and comprehensive study, that in fact the only practicable and feasible disposal sites available for the project to be permitted under this application involve open water placement in the inshore waters of Calibogue Sound. These include placing the majority of the finer-grained maintenance material in at least two deeper water locations and the sandy material from the facility entrances in the water column in front of adjacent beaches. Placement can be

accomplished so that no unacceptable adverse effects on those waters and the marine life in those waters will result. This justifiable conclusion has been arrived at for the reasons, and upon the evidence, set forth below.

A REVIEW OF THE SIDA PROJECT-ITS SCOPE, PARAMETERS AND GOAL

In the interest of providing an orderly, understandable review of the alternative site selection process utilized by SIDA, a brief review of the scope, parameters and goals of the SIDA dredge project which is the subject of this permit application is necessary and desirable.

SCOPE OF THE PROJECT

The scope of this project can best be visualized and understood by reference to maps of the several waterways included in the permit application for dredging. Attached as Figure 1 is a map of Hilton Head Island (situate in southern Beaufort County, South Carolina). This map also shows lands and waters surrounding Hilton Head Island within a geographical area extending approximately five miles from the Island. Through the course of this presentation, reference will be made to the map, and specifically to many of the individual tracts and waterways identified thereon by code (see the legend on this map).

Approximately the south one-third (1/3rd) of Hilton Head Island has been developed as "Sea Pines Plantation" (herein called "Sea Pines"), a contiguous tract of approximately 5,200 acres that comprises 5,890 residential sites (98% built-out) and also approximately 65 commercial business operations, many of which are located at Harbour Town and South Beach Marina and depend upon navigable water for their operations.

The organization and development of Sea Pines began in the early 1960's. It was the first development project on Hilton Head Island, which at that time was virtually unused except by a few native inhabitants. More important to an understanding of the SIDA project, Sea Pines was one of the first planned communities on a barrier island in the United States, and its entire "finished plan" was laid out by the development company before marketing and sales of property to the public commenced. This overall plan included not only residential lots, specified areas for commercial operations, and tennis/golf/horseback riding/recreational facilities, but also a comprehensive development, creation and installation of lagoons, canals, navigable creeks, and marinas - for the obvious purpose of fully utilizing the natural relation of the Island's proximity to its surrounding waters, such as the Atlantic Ocean and Calibogue Sound. The result has been a nationally acclaimed and often copied community, which is certainly one of the true landmarks within South Carolina. To say that it is one of South Carolina's major tourist destination centers is understating the impact Sea Pines Plantation, and its water-oriented amenities have had on the state and its growing number of residents and visitors since 1960.

The waterways included within SIDA's application of a dredging permit are definitely an important, integral part of this community. Harbour Town and South Beach Marinas provide necessary docking facilities for boats either visiting the Island, or owned by residents who want ready-access to the water activities of the area. Both of these marinas are visited by

more than a million people each year. Because Sea Pines Plantation is primarily a waterfront community, at least one-third of its 5,200 property owners are directly affected by

- Figure 1. Map of Sea Pines Plantation and Adjacencies, Town of Hilton Head Island

these problems, and are represented by SIDA. Navigation problems at the marinas, and in their connecting channels, have now reached the intolerable point where regular scheduling of boating activities is curtailed and sometimes prohibited due to lack of sufficient water depths.

SIDA was formed in early 1999 to provide a non-profit organization that can assist the several different residential communities and marinas in obtaining permits, dredged material management, and funding for continued maintenance of the navigable tidal waterways and marinas in Sea Pines. To provide a more definitive understanding of the problems now confronting SIDA and its members, the following historical information for each of the facilities covered by this permit application is presented. Long-term residents and members of the management of Sea Pines Company assisted in compiling this information.

GENERAL

The waterways and basin areas under study (Baynard Creek, Braddock Cove Creek, Harbour Town basin, and the South Beach and Gull Point basins) were all natural waterway and intertidal areas that formed an integral part of the original Sea Pines Company development plan. These areas are all located at the south end of Hilton Head Island and all are connected to the Calibogue Sound. For the most part, the initial excavations to make these areas navigable provided a large amount of high-quality fill material that was used to develop the Sea Pines Plantation component properties.

HARBOUR TOWN MARINA

The present Harbour Town marina basin and concrete panel wall was constructed in 1968 from a natural area consisting of tidal creek and intertidal marshlands. Prior to excavation and bulkheading, there was an existing commercial dock in the cove area that was used by commercial fisherman and Daufuskie Islanders for access to the mainland. The dredged material from this first excavation contained enough high-quality fill material so that it was used to fill the area now occupied by the 18th fairway on the adjacent Harbour Town Golf Links. Some of this fill was also placed to improve the areas now occupied by the Schooner, Ketch, Cutter, and Caravale Courts and the area now occupied by the Golf Clubhouse.

The first maintenance event was performed in 1973. Approximately 50,000 CY were excavated from the basin area and approaches and placed in the Calibogue Cay site (40,000 CY) and on the Lawton Stables Tract (10,000 CY). At that time the developer (Sea Pines Company) was just beginning the development of the Calibogue Cay area. They were also the owners of both the Deer Island property, on which the Calibogue Cay CDF was constructed, and the owners of Harbour Town. The few residents in the Calibogue Cay POA at the time voted to permit this one-time use of the CDF by Sea Pines. In the same way, the Sea Pines Company also owned the Lawton Stables Tract. Fill was excavated from this property for development of the surrounding areas and a small amount of dredged material from Harbour Town was pumped to the site to refill some of these areas. Since that time, the ownership of Harbour Town has been transferred to different owners. Sea Pines

retains ownership and control of the Lawton Stables Tract and has completed development of Sea Pines Plantation. The Lawton Stables area is no longer suitable or available for the use of Harbour Town (see discussion of the Lawton Stables Tract below).

By 1978, the Harbour Town facility had a serious entrance channel shoaling problem. The Sea Pines Company received an agitation-dredging permit to maintain the channel entrance. Approximately 7,000 CY were removed at that time. In 1979, the Sea Pines Company received a permit to experiment with sediment resuspension by employing a cross-entrance "bubble curtain" designed by Dr. Per Brunn. This device was considered ineffective at the time and was dismantled within a few months.

In 1987, existing Sea Pines Company dredging permits for Harbour Town were transferred to the new owner, Fogelman Properties. No upland alternatives were available to them, so Harbour Town performed its first ocean disposal project. Approximately 98,500 CY were excavated by mechanical dredge equipment and placed in the Savannah Harbor ODMDS. The cost of this effort was approximately \$790,000. Since that time, use restrictions have been placed on the Savannah Harbor ODMDS and sediment barrier wing walls have been installed in the Harbour Town entrance area that do not permit the large mechanical dredging equipment used in ocean disposal to be brought into the inner basin.

In 1994, Prudential Bache/Fogelman Harbour Town Properties received a permit to dredge approximately 25,000 CY from the entrance channel and antebasin areas by mechanical means. (The inner basin was not dredged because the equipment could not enter all the way into the Harbour.) The dredged material was placed in the Port Royal ODMDS with a project cost of \$272,900. The permit was amended in 1996 and the inner dredging of the entrance channel, antebasin, and inner basin was accomplished with a combination of ocean-certified hopper scows and tugboats and small hydraulic dredging equipment (cutterhead and Mudcat). The material was excavated by hydraulic means, pumped to a scow in the Sound, overflowed until a suitable volume was settled out in the scow, and then the material was transported offshore to the Port Royal ODMDS and placed. Approximately 53,000 CY were removed at a cost of \$492,000. Besides the exorbitant cost, this project had severe logistical difficulties including the marriage of traditional ocean dredging equipment with small hydraulic dredge equipment. These fine-grained materials cannot effectively be settled out in an area as small as a 3,000 CY hopper scow. The Port Royal ODMDS has also been deauthorized since this project was completed (see below).

BRADDOCK COVE CREEK (INCLUDING SOUTH BEACH MARINA AND GULL POINT MARINA)

Prior to the development of Sea Pines Plantation, the Braddock Creek waterway provided riparian owners with access to the Sound, but only at the highest stages of the tide. In 1972, the Sea Pines Company performed the first major dredging effort to provide vessel access at low tide conditions. The South Beach Marina basin area was also enlarged at this time. The dredged material from this initial event contained a relatively large amount of high-quality fill material that was placed on adjacent uplands and used to improve the land for the development of that area now known as Lands End. The lack of practicable alternatives has not permitted maintenance on a schedule that keeps the channel open to recreational

vessels at low tide. Three events (of a partial nature) have been performed since the initial excavation. These events include a project in the late 1970s that sources indicate was an agitation dredging operation and one in the 1980s that may have utilized the Port Royal ODMDS. The last event (in 1994) removed approximately 86,000 CY from these areas. The material was excavated by a small hydraulic dredge and pumped into ocean-going hopper scows, which were subsequently towed to the Port Royal ODMDS for disposal. These areas are in need of maintenance dredging at this time and the stakeholders in this area (the South Beach POA, the South Beach Marina, and the Gull Point POA) do not have a practicable dredged material management alternative to complete this effort.

BAYNARD CREEK

Prior to the 1967 development of this area, Baynard Creek was only navigable at high tide conditions. As part of the development, the Creek was dredged in 1967 to provide Calibogue Sound access to the individual property owners and for users of the Community Dock. The material excavated from this initial event was deposited in a site constructed on adjacent upland property. This site was subsequently closed and the land incorporated into the Sea Pines development. The only maintenance dredging of the Creek was performed in 1984. Sources indicate that this material was placed in a marsh area near Audubon Pond that has subsequently been developed. Since that time, alternatives have not existed that are financially supportable by the POA. The POA recently applied for and received a maintenance-dredging permit, but the only management alternative available was ocean placement in the Port Royal ODMDS. This alternative is not practicable for this group because of the prohibitive costs and does not represent a long-term management solution. The Creek is predominately intertidal and is in serious need of maintenance.

In concluding this historical review, it should be noted that Gull Point Marina and the Braddock Creek/Baynard Creek waterways are the only two areas within Sea Pines that allow sheltered, full-time dock facilities for residents. These facilities were on the original master plan for the community, and lend considerable ambience to all of Sea Pines Plantation. They are much utilized for boating, kayaking, and sport fishing by residents and visitors, but those enjoyable activities are now greatly curtailed, and in danger of being lost, because of the major accumulation of silt deposits that greatly impair navigation through these waterways.

The goal of SIDA and its members is to dredge these facilities and return them to usable, navigable waterways. Previous dredging projects over the past 25 years required transportation of the spoils to a Corps of Engineers designated ocean disposal site designated for the federal project in the Port Royal Sound. For reasons detailed in the discussion below, that procedure is no longer a viable, practicable option for the SIDA members. And, as well documented below, all efforts by SIDA to find any suitable, practicable upland site(s) for this project have been totally unsuccessful.

It is estimated by ATM's engineers that restoration of these waterways to an average depth of 8 feet at mean low tide, with 60 feet of channel width into the basins, will yield over 195,000 cubic yards of fined-grained material and up to 150,000 cubic yards of sandy profile

nourishment-quality material. Most of the material to be removed can best be characterized as fine-grained maintenance material-it is at least 80% water when pumped out with a suction-type dredge. A full-scale sample testing program (detailed below) has proven that there are no contaminants in this mud that could adversely impact the waters and marine life in Calibogue Sound. By working closely with all interested federal and state agencies, and by preparing scientifically-sound models to predict how the spoils plume will react within the tidal currents of the Sound, SIDA's consultants have established that this plan is, in fact, the only practicable and feasible method to reestablish these waterways to reasonable navigable status and preserve them for future use by all the public.

REVIEW OF REGULATORY GUIDELINES FOR DREDGE MATERIAL DISPOSAL

The discharge of dredged material into waters of the U.S. is regulated under Section 404 of the Clean Water Act (CWA). The §404(b)(1) Guidelines can be found in 40 CFR Part 230 and are also reprinted as an Appendix in the Inland Testing Manual (USEPA/USACE, 1998a). Both the federal §404 Guidelines and the OCRM Regulations give preference to upland and ocean disposal alternatives over and against placement in 404 open waters, unless an upland disposal would have adverse environmental results.

The applicable scope of the federal guidelines, per §404(b)(1) of the Clean Water Act is summarized as follows:

The guidelines are applicable to the specification of disposal sites for the discharges of dredged or fill material into the waters of the United States. Sites may be specified through...(1) The regulatory program of the U.S. Army Corps of Engineers under sections 404(a) and (e) of the Act... §230.2(a)

According to the supplementary information contained in 40 CFR Part 230, specified disposal sites must be “practicable”:

...the only alternatives which must be considered are practicable alternatives. What is practicable depends on cost, technical, and logistic factors...Our intent is to consider those alternatives which are reasonable in terms of the overall scope/cost of the proposed project... If an alleged alternative is unreasonably expensive to the applicant, the alternative is not “practicable”... it must be reasonably available or obtainable. However, the mere fact of ownership or lack thereof, does not necessarily determine reasonable availability.

An alternatives analysis must also consider the South Carolina OCRM Regulations as they relate to dredged material management alternatives (CZM consistency) and the State 401 water quality certification process. The OCRM Regulations are reasonably consistent with the 404 Guidelines. The OCRM Regulations make use of the word “feasible” where the 404 Guidelines use “practicable.” The applicable OCRM Regulations, which come from DHEC Chapter 61 state:

- Existing facilities must have either permanent upland disposal sites or EPA approved ocean disposal sites - R.30-12.G(2)(f)
- Upland disposal of dredged material shall always be sought in preference to disposal in wetlands. Vegetated wetlands and mudflats shall not be utilized for disposal of dredged materials unless there are no feasible alternatives – R.30-12.I(2)(a)
- Open water and deep water disposal should be considered as an alternative if highland alternatives are not feasible - R.30-12.I(2)(b)
- Wherever feasible, existing disposal areas shall be utilized to the fullest extent possible; this would include raising the height of the embankments to increase the holding capacity of the disposal area - R.30-12.I(2)(f)

The OCRM Regulations define feasible to be:

...based on the best available information, including...consideration of factors of environmental, economic, social, legal, and technological suitability of the proposed activity and its alternatives...“Feasible alternatives” applies both to locations or sites and to methods of design and construction... - R.30-1.D(20)

While the Guidelines “prefer” upland disposal over ocean or open water alternatives, the Guidelines also recognize that placement in an upland facility is not necessarily less impactful than returning the material to the estuarine system. According to 40 CFR Part 230:

...once these practicable alternatives have been identified in this fashion, the permitting authority should consider whether any of them, including land disposal options, are less environmentally harmful than the proposed discharge project. Of course, where there is no significant or easily identifiable difference in impact, the alternative need not be considered to have “less adverse” impact.

...some commenters were concerned that the alternative consideration was unduly focused on water quality, and that a better alternative from a water quality standpoint might be less desirable from, say, an air quality point of view. This concern overlooks the explicit provision that the existence of an alternative which is less damaging to the aquatic ecosystem does not disqualify a discharge if that alternative has other significant adverse environmental consequences. This last provision gives the permitting authority an opportunity to take into account evidence of damage to other ecosystems in deciding whether there is a “better” alternative.

For the purposes of this analysis, “practicable” and “feasible” are taken to have essentially the same meaning. The potential “practicable” alternatives are discussed and compared to determine the optimal alternative, in terms of environmental factors, social and legal issues, technological considerations, and costs. The following section identifies the alternatives in order of preference to the regulatory agencies.

IDENTIFICATION OF POTENTIAL ALTERNATIVES

This section will identify the known potential locations and provide information concerning the long-term establishment of each. Emphasis is placed on the temporal aspect of this

endeavor. Recent and historical dredging projects have been individual efforts that have garnered case-by-case permits for typically 3 years. The current goal for SIDA is to bring member facilities into compliance with the OCRM Regulations [R.30-12.G(2)(f)] by specifying a long-term¹ disposal option (i.e., for more than 10 years) to accommodate SIDA's current and future maintenance dredging needs. Organizationally, the potential alternatives are presented, discussed, and evaluated in three broad categories: ① confined upland placement; ② ocean placement; and ③ inshore open water placement. Because the 404 Guidelines seek to designate the least environmentally damaging practicable alternative, the categories are presented in an order that it is typically considered least to most potentially damaging (confined upland placement first, ocean placement second, and inshore open water placement last). In actual practice, this order really represents typical ease of regulatory permitting. It is not always clear that upland placement alternatives are less environmentally damaging than placement in ocean or inland waters.

UPLAND PLACEMENT

As preference for confined upland sites is contained in both the OCRM Regulations [R.30-12.I(2)(a)] and implicitly in the 404 Guidelines, practicable alternatives under this category were sought first. Upland disposal facilities generally require maximizing the available area to limit the initial improvement costs, reduce required dike heights, provide more effective settlement of fine-grained material, and minimize material desiccation times. The ideal dredge disposal alternative (for any facility) would consist of an appropriately sized upland confined disposal site in close proximity to the subject dredging location.

The primary criterion for any confined upland disposal alternative to meet SIDA's long-term management needs is capacity. With an approximate initial quantity of 195,000 CY of fine-grained material and 150,000 CY of cyclical maintenance material, ATM estimates that a minimum of 25 acres is required. This estimate is based primarily on meeting the needs of the initial effort with an initial effective dike height of 8.5 ft and a nominal material expansion factor of 1.5. Alternatively, multiple confined upland facilities of greater than 5 acres each with similar dike assumptions could be managed collectively to meet the project goals. Applicant's survey takes these requirements into consideration.

The legal and environmental considerations go hand-in-hand with the capacity requirement. In order to use an existing site or develop a new one, the site must be legally available for SIDA's long-term use and the development and maintenance of such a facility (CDF) must consider the potential environmental impacts in the siting and operation of the CDF. The cost and social issues for this alternative are secondary, but also very important.

Upland availability adjacent to the SIDA member facilities is severely limited to the point of becoming nonexistent. This is due to the existing level of development (i.e., Harbour Town, South Beach, Baynard Cove, etc.), as well as strict zoning codes imposed within the Sea Pines development. These restrictions include Open Space, Conservancy, and Forest

¹ The OCRM Regulations specify a "permanent" disposal site.

Preserve covenants (see Figure 1). According to the Sea Pines master plan and covenants, only two parcels within the limits of Sea Pines Plantation are specifically designated for the purposes of dredge disposal. One is referred to as the Lawton Stables Tract and the other is the Calibogue Cay disposal site. Each is discussed in the following sections.

- Figure 2. Potential Upland Disposal Sites

LAWTON STABLES TRACT

The Lawton Stables tract is located in Sea Pines Plantation in the area indicated on Figure 1&2. It is not located near any Sea Pines waterways and is primarily used as a park area, green space, and livery. The total upland area of the site encompasses approximately



22 acres. However, only 2 acres of this tract could be used as part of any comprehensive dredged material management plan and only for material dredged from one (i.e., Harbour Town) of the SIDA member facilities. The Lawton Stables tract covenants state “the use of *existing or future lakes* on the 21.786-acre Lawton Stables tract as a disposal area for dredged bottom material from the *Harbour Town Yacht* basin will be specifically permitted (italics added)...” Although this site

was utilized in the past for small dredging events at the Harbour Town Yacht Basin (last time was 1980), the Sea Pines Plantation has since been fully developed and the parcel includes a pond area totaling only 2 acres (refer to letter from CSA dated 1 July 2000 in the Appendix).

Limitations for use of the Lawton Stables tract include: ① the legal designation (which allows only spoil from Harbour Town Yacht Basin); ② severely limited available capacity; ③ logistical impracticability; ④ ownership and control issues, and ⑤ adverse environmental impact.

The limitation on use at the Lawton Stables pond by Harbour Town is problematic even under a dredged material management plan that uses a multi-site approach. With Sea Pines now developed, the conveyance pipeline cannot reasonably be routed to the site from

Harbour Town. ATM estimates a minimum initial dredge quantity requirement of approximately 30,000 CY from the Harbour Town Yacht Basin alone. The remaining lake areas on the Lawton Stables tract cannot accommodate even this volume. No other lake areas can be developed. In fact, the owner of the property has refused permission for any use for dredged material management (see letter from the Sea Pines Company dated 14 August 2000 in the Appendix). The original purpose for allowing use of the site for dredged material



was to replace the upland areas removed from quarrying the property during the development of Sea Pines Plantation. Harbour Town was last able to use the site in 1982, when both the Tract and the marina were owned by Sea Pines Company and the area around the Lawton Stables park was still developed. Since then, ownership of the marina has changed and they have had to resort to expensive ocean disposal options totaling over \$1.5 million for less than 200,000 CY of material.

If the site were feasible in terms of capacity and logistical acceptability, a strong effort would be made to overcome the owner’s refusal to use the site. But, previous ATM experience

suggests that a minimum CDF size of approximately 5 acres is required for use with a 12 to 14-inch dredge plant. Dike construction requirements; surface area requirements to effectively settle solids; and dike stability during filling; and other considerations dictate a minimum overall CDF size regardless of the volumetric requirements of the project. A CDF cannot feasibly be constructed on the site for even a part of the Harbour Town material and other SIDA members are strictly prohibited from using the site at all. Trucking accumulated spoils out of Sea Pines will not be allowed (see attached letter from CSA dated 26 March 1999).

Therefore, the Lawton Stables site will not suffice even in the short-term solution for Harbour Town or as a portion of a multi-site dredged material management alternative for SIDA. The site is located in the middle of the upland portion of Sea Pines Plantation and was used in the early days of development as a quarry for quality fill material. Some of these quarried areas were refilled with high-quality dredged material from the initial excavations at Harbour Town Yacht Basin, but the tract is no longer available for use for dredged material management because of access, capacity, and owner permission issues. Conveyance pipelines in excess of three miles would have to be placed along major Plantation roadways with provision made for underground crossings and with periodic booster pumps. CDF dike construction would require secondary stabilization to create a more vertical side slope and prevent "blow-outs." For the minimum and certainly one-time use, this type of solution is neither practicable nor feasible. The combination of legal, logistical, and capacity issues eliminates this alternative from further consideration even as part of a multi-site approach to long-term management of SIDA material.

CALIBOGUE CAY DISPOSAL AREA

The Calibogue Cay confined disposal facility (CDF) is located adjacent to Back Creek, immediately landward of Calibogue Cay (see Figures 1 & 2). As this appeared to be the best hope for a practicable upland alternative, a detailed feasibility study of the Calibogue Cay CDF was completed for SIDA in July 1998 (ATM, 1998b). The relevant details and conclusions of this report were excerpted from the study and are presented here. The existing site requires extensive redevelopment and enlargement to be useful for cyclical long-term maintenance. Additionally, current covenants restrict the use of the site to sediments excavated from the adjacent Back Creek. A detailed study was initiated to examine the feasibility of site redevelopment for SIDA's long-term use from logistical, cost, legal, and social perspectives. The study examined the existing conditions and potential capacity of the Calibogue Cay CDF and the feasibility and conceptual costs associated with improving the site for the long-term management of SIDA member maintenance dredged material.

When evaluating this site for any dredge project, an important fact to note is that the "Back Creek" of Calibogue Cay was partially dredged in 1996, and the spoils from that project are still onsite. Thus, its present capacity for additional dredged material, in its current state, is minimal (not in excess of 6,000 CY). It is estimated that approximately 600 truckloads would be required to remove the 1996 spoils.

The ATM study identified several problems with the proposed use of the Calibogue Cay CDF, including:

- limited site capacity at the fully developed state;
- covenant restrictions that are insurmountable;
- logistical problems including the required heavy use of the Sea Pines roadways by dump trucks for initial improvement and regular unloading of the facility; and
- aesthetic/social problems with excessive dike elevations blocking adjacent owners' marsh vistas.

These factors were determined to render the Calibogue Cay site inappropriate for use as part of SIDA's project. The CDF facility at Calibogue Cay has an estimated initial *existing* capacity of 6,000 CY. The available upland (contained within a 34-acre open space parcel of Deer Island) was surveyed and a conceptual spoil site planned that would maximize site use by applying a limited (10 ft) buffer around the entire upland/marsh boundary. This resulted in a maximized storage area of 14.9 acres and an initial improved capacity of 118,000 CY (assuming a constructed dike height of approximately 17 ft above existing grade). Construction costs for this initial improvement were estimated to be \$235,000, not including permitting, surveying, and other "soft" costs.

The limited initial capacity requires a "phased" approach to be taken to initial excavations. Application of a nominal 40% desiccation factor, prioritized initial dredging, and a methodical dike raising program results in ultimate site capacity being reached in 5 years with final dike heights of 23 ft above grade. Potential truck haul removal of material from the site was also investigated, but excessive truck haul costs (\$5-\$8/CY), prolonged heavy truck traffic on residential Sea Pines roadways, as well as social issues of excessive dike height blocking the view of adjacent Sea Pines communities further restrict the potential for use. Correspondence from CSA further supports these considerations (refer to letter from CSA in the Appendix dated 26 March 1999).

The Calibogue Cay CDF is sited on land owned by CSA; however, the *Sea Pines Land Use Covenants* for Calibogue Cay, Back Creek, and Contiguous Areas state that the site is expressly reserved as a CDF for dredged material from Back Creek (lying behind Calibogue Cay) only. This condition can only be changed by "...a majority of the then owners of lots substantially affected by such change in Covenants..." Communications between CSA and the Calibogue Cay homeowners show that they are not willing to enter into a use agreement with SIDA. Calibogue Cay has an ongoing siltation problem in the Back River and this site represents these owners' only dredged material management alternative. Placement of any SIDA facility material on this property reduces the overall capacity, limits the Calibogue Cay POA's options, and shortens the useful time horizon of the property because the material cannot be effectively removed from the site once placed.

The Calibogue Cay Dredging Association has removed this site from consideration. Letters from Robert Willock, President of this organization, state that SIDA should not consider use

of this property for any portion of their dredged material management needs (see Appendix for copies of the letters dated 30 June 1999 and 10 May 2000). Mr. Willock cites reduced capacity issues, the existing covenants, and the views and attitudes of the existing property owners. These considerations combined with the very practical considerations of high site development costs for a limited volume remove this site from consideration. The owners of properties adjacent to the Deer Island property on which the Calibogue Cay CDF is constructed have already voiced their displeasure with the degradation of their marsh vistas and the poor aesthetics of a two-story dike structure. These owners would surely attempt to block any significant site redevelopment of the Calibogue Cay CDF.

In summary, this site must be removed from consideration for use as a long-term management alternative for all or even part of the SIDA dredged material. The site is currently restricted to use by the Calibogue Cay POA for dredged material from Back Creek. The Calibogue Cay Dredging Association is already planning to use the site in the near future (Fall 2000). There is no reasonable prospect of revising these covenants. In a fully developed state, capacity will be reached within five years leaving a 15-acre facility in the middle of a now attractive marsh vista. The Calibogue Cay owners will have lost their long-term alternative and SIDA will still require a long-term management alternative for their needs. Even under the ideal scenario (as expressed in the site use feasibility document and summarized above), site management and dike raising demands required by SIDA use must proceed less than acceptable rates. After the five-year time horizon is exhausted, cyclical dredging of the SIDA facilities will still be behind maintenance needs, all capacity in the only available upland CDF in Sea Pines Plantation will be consumed, and SIDA and the Calibogue Cay owners will still be in need of a long-term management alternative.

EGRET ISLAND

This is the one presently undeveloped upland site within Sea Pines that is now privately owned. Ownership was recently acquired by White Hat Properties (Mr. Frank Guzzio, principal). Egret Island is designated in the development plans of the Plantation for residential use, and thus is restricted to the uses permissible under covenants applicable to that designation, which would not include storing dredge spoils (see Figure 1).

This island is very small - approximately three (3) acres of upland surface at mean high tide. Also, it is completely surrounded by wetlands and marshes, so that building an access road to it is impossible. Thus, access is limited to shallow draft boats during times of high tide. Even if spoils were pumped onto it, there would not be a way to prepare it as a satisfactory CDF, nor could the accumulated spoils thereafter be removed.

Mr. Guzzio has advised SIDA in that Egret Island cannot be considered for use as a dredge spoil disposal site. For all of the above reasons it is not available for the use in the project to be permitted under this application.

OPEN LAND/FOREST PRESERVE SITES IN SEA PINES

There are several upland tracts within Sea Pines Plantation that are not presently developed with housing or other fixed facilities, but all are specifically designated on all maps and plans as “open space”, which has a very defined meaning in the land use covenants of Sea Pines. As explained in the attached letter from legal counsel (dated 22 June 2000) for CSA, open space lands cannot be used for the disposition of dredging spoils because of the restrictive covenants. A review of the applicable limitations follows.

Forest Preserve lands

This 605-acre tract (see Figure 1) is the largest single open space site in Sea Pines that is not “developed” within the sense of fixed facilities that prevent setting up a disposal site. The Forest Preserve is owned by Sea Pines Company, whose management has advised SIDA in writing that no portion of the tract can be used for dredge spoil disposition (temporary or permanent).

In any event, the plats and covenants filed in Beaufort County designate the entire tract as a “forest preserve”, with allowable uses strictly limited to wildlife habitat, outdoor recreation, and waste water/sanitation purposes. As noted in the attached letter from CSA, numerous groups closely monitor activities in the preserve, and any attempt to use even a portion of the site for disposal of dredge spoils would result in immediate opposition. And, as for other upland sites in Sea Pines, the heavy trucks over an extended time period to remove the accumulated spoils to a remote location would not be acceptable. Thus, the Forest Preserve tract cannot be considerable as an upland disposal site.

Other “Open Space” Sites In Sea Pines

There are only three other upland sites in Sea Pines that are “open”, but each is also designated on the maps and in the covenants filed in Beaufort County as “Open Space Areas.” All three sites are owned by CSA. They are identified on the attached map (Figure 1) of the Plantation.

As stated in the attached letter from CSA, and also in the letter from legal counsel (Vaux & Marscher, P.A. dated 22 June 2000) for CSA, use of one or all of these tracts-even if physically satisfactory for temporary storage of dredge spoils-would be a direct violation of the covenants. Whenever there has been a previous proposal to use one of the open space sites for a dredging project, the opposition of adjacent property owners has been adamant. For all of the reasons stated in the CSA letters, these open space sites cannot be made available for this dredging project.

All efforts and inquiries to find one or more suitable upland tracts within Sea Pines Plantation for use in this project require the conclusion that none are available. The attached letters and references confirm this conclusion.

OTHER UPLAND SITES (OUTSIDE SEA PINES PLANTATION)

Other potentially feasible upland sites were investigated within a 5-mile radius of the SIDA facilities (refer to Figure 2). This radius was deemed the reasonable limit for a search considering the logistics of small hydraulic dredges; however, the practical and cost effective pumping limit for 8 to 10 in. hydraulic pipeline dredges, which are typically required for the SIDA excavations, is closer to 1 to 2 miles. Dredged material conveyance beyond a distance of 2 miles would require use of a single large booster pump, or multiple boosters, which can raise the unit dredging price by \$1.50 per cubic yard for each booster. In addition, higher mobilization costs would be anticipated due to the booster pump requirements. If required to pump across Calibogue Sound, dredging costs would also increase relative to the contractor's increased safety and equipment risks associated with maintaining a submerged pipeline across the Calibogue Sound channel (Lavelle, 1999). The search area was limited to waterfront properties, since the conveyance of dredge material across significant upland distances to inland locations is not likely to be permitted on Hilton Head Island and presents severe logistical difficulties.

- Areas Surrounding Sea Pines. The area surrounding Sea Pines on Hilton Head Island is occupied by Spanish Wells Plantation, Indigo Run, and Wexford Plantation. Each of these tracts border Broad Creek. No lands are available for SIDA dredge spoil in any of these areas, all of which are highly developed residential communities.
- Buck Island (see Figure 2) is located along the east bank of Calibogue Sound, approximately 1.7 miles northeast of Harbour Town Yacht Basin. ATM and SIDA representatives visited Buck Island in 1998. Buck Island has two factors that render it unusable. First, the upland area (scaled from Beaufort County Tax Map Sheet 14, Hilton Head) is only ±11 acres. This area is less than that of the conceptual improved disposal site at Calibogue Cay. Therefore, on this basis alone, it is not of sufficient capacity for long-term consideration. Secondly, there is a home on the island and the owner, Mr. Welles Murphey, Jr., has stated that he will not consider granting easements for any dredge spoil to be disposed of on Buck Island. A copy of relevant correspondence from Mr. Murphey (dated 24 March 1999) is attached.
- Water-accessible areas along the westward bank of Calibogue Sound, across the waterway from the SIDA facilities, were also considered. The candidate sites include Barataria Island, Bull Island, and Haig Point on Daufuskie Island (refer to Figure 2). Barataria and Bull Islands are located west of the confluence of Calibogue Sound and May River. The center of Barataria Island is 3.4 miles north of Harbour Town Yacht Basin, although water access along Barataria Creek (i.e., pipeline distance) is closer to 3.7 miles. Although the upland at Barataria Island measures roughly 150 acres (cf., the Beaufort County Tax Map), the island's owner Mr. Alfred Loomis (see letter from Mr. Loomis dated 4 May 2000 in the Appendix) has stated to SIDA that the island is under a conservation easement that would not permit the development of a CDF on the property. Barataria Island was therefore removed from further consideration.
- Bull Island is also owned by Mr. Loomis. Bull Island is accessible via Bull or Bryan Creeks. The relative minimum distances to Bull Island from Harbour Town Yacht Basin are 3.2 miles via Bull Creek and 2.6 miles via Bryan Creek. Site capacity at Bull Island would only be limited by use agreement restrictions and current upland uses. Costs for this alternative, due to the limited

water-only access to Bull Island, as well as the required length of submerged pipeline and associated booster pumps would be much higher than upland alternatives closer to Sea Pines. These obstacles present serious problems, but ones that ATM believed could be overcome. However, in a letter to SIDA, Mr. Loomis has stated that he will not grant SIDA authority to dispose of dredge materials on either Bull Island or Barataria Island (see attached letter dated 4 May 2000).

- Haig Point is the northernmost tract on Daufuskie Island, located across Calibogue Sound and approximately 1.3 miles west of Harbour Town. Haig Point is a large real estate development of International Paper Company and is the most developed tract on Daufuskie. The logistic and cost problems associated with this location relative to a SIDA CDF are similar to those described above for Bull Island. In addition, in a letter from Haig Point's vice president of construction operations, SIDA has been advised that there are no areas available within Haig Point that could be made available to SIDA for upland dredged material disposal (see attached letter from Benny K. Jones dated 5 April 1999).
- AIW spoils areas behind Daufuskie Island. The Corps of Engineers has designated upland spoils areas on Ramshorn Creek (off the Cooper River) toward the southerly end of Daufuskie Island. SIDA and ATM made inquiry to the Corps office about the possibility of using one or more sites for the SIDA project. Attached is a letter (dated 1 May 2000) from the local Corps office in Savannah stating that none of these sites are available to SIDA because they are restricted to federal usage only. Also, they currently are "unconfined" so that even the Corps is not permitted to use them at this time. The Corps is having to transport the AIW maintenance material all the way to CDF Area 14A on the Savannah River. SIDA finds that these sites are not available to its members.

SUMMARY OF UPLAND SITE INVESTIGATION

Based upon the above findings, it is the conclusion of SIDA that there are no existing CDF's, or land that could be developed by SIDA into CDF's, within a reasonable, practicable distance of Sea Pines. Concluding that upland disposal of their dredged material is impossible, SIDA and its members, with the assistance of ATM, next investigated ocean placement opportunities (as regulated under Section 103 of the Marine Protection, Research, and Sanctuaries Act).

OFFSHORE/OCEAN DISPOSAL

Offshore disposal is an alternative that has historically been selected by the US Army Corps of Engineers (USACE) for harbor and navigation entrance channel dredged material disposal. The US Environmental Protection Agency (USEPA) has established guidelines to permit the use of ocean disposal sites. THE USEPA designates offshore disposal sites, termed Ocean Dredged Material Disposal Sites (ODMDS), under to §102 of the Marine Protection, Research, and Sanctuaries Act (MPRSA). The sites in the Hilton Head Island vicinity were considered for this alternatives analysis.

PORT ROYAL ODMDS

For offshore/ocean (§103 MPRSA) placement for the Hilton Head and Port Royal vicinity, the historical site has been the Port Royal ODMDS. This site is located approximately 10 miles offshore of the Port Royal Sound entrance. It is approximately 14 miles northeast of the south end of Hilton Head Island. The Port Royal ODMDS encompasses roughly 920 acres and averages 35 feet deep relative to mean low water (MLW).

The advantage of using a designated offshore disposal site is that the spoil site determination is completed, and authorized. The primary factor that determines whether or not the ODMDS may be used is the result of the sediment quality testing and evaluation. In the most basic terms, should the sediment quality prove acceptable, then the site would be usable.

The problems associated with use of the Port Royal ODMDS for the SIDA facilities is practicability, both from cost and logistical factors. Use of the ODMDS involves multiple contractors and requires US Coast Guard certified ocean-going hopper scows and tugs to be utilized. This large-scale equipment must be used in conjunction with small hydraulic dredge apparatus. The large clamshell dredge equipment usually used with these scows cannot access the interior of Harbor Town or enter any of the navigation channels of the other SIDA facilities. Pumping into the scows requires considerable overflow and a relatively small surface area for material settlement. Additionally, the leakage of the fine-grained material through the scows is extremely difficult to prevent. These logistics and technological problems require double handling of the dredged material at exorbitantly high costs. These costs are further increased by the regulatory requirements for dredging to be completed only during the winter months (November to March) when the most severe offshore weather in the Atlantic Ocean is frequent. The short window demand for specialized and scarce equipment further drives up the price to a prohibitive level. An unusual operation of this sort virtually eliminates competitive bidding. The added risk of offshore operations (requiring US Coast Guard offshore vessel certifications) beyond the COLREGS line for the offshore alternative tends to increase dredging and disposal costs for winter construction.

As an example, the Port Royal ODMDS was utilized as a disposal site for the 1995-1996 Harbour Town Yacht Basin dredging event. The contract involved a hydraulic dredge for the basin, with the material conveyed to a scow in Calibogue Sound, which was then towed to the Port Royal ODMDS for dumping. Costs for this multi-leg event included a mobilization fee of \$163,000 and unit cost of \$8.67/CY (for a total dredge quantity of only 38,500 CY). Dredging efficiency was also reduced via the double handling of disposal materials.

The Port Royal ODMDS was also used for the last dredging event at South Beach and Gull Point Marinas in March 1994. It is important to recall that only SIDA's *commercial* facilities have been able to afford the excessive costs associated with disposal in the ODMDS. Gull Point Marina was issued a separate dredging permit by the OCRM and USACE, but Gull Point was fortunate enough to coordinate regulatory and fiscal timelines with South Beach. Despite this coordinated effort, which did reduce the parties' total mobilization costs, the total

1994 expenditures for both South Beach Marina and Gull Point Marina were stretched to an economic limit. Since 1995, ocean disposal costs have virtually doubled (see Exhibit A).

In 1995, Baynard Cove POA was issued a dredging permit that requires ocean placement, but the costs of this operation were well beyond the means of these owners for even a one-time event. The permit expired without implementation of a dredge program. As a predictable and manageable alternative, ocean disposal is impossible for a POA.

Ocean disposal has only been possible for Hilton Head's commercial facilities. Only Harbour Town has been able to employ this alternative more than once and not with the frequency of a proper dredged material management plan. Each effort requires a separate permit; campaign to slip owners for need and justification; a high cost assessment on the owners; and a logistically complex and unreliable contractor group involving multiple parties and expensive Coast Guard certified equipment. These past ocean disposal operations permitted the commercial facilities to effect emergency dredging events, but quantities had to be limited and the facilities must wait much longer between events than is recommended to secure the \$600,000 to \$750,000 per event (excluding soft costs and testing) that was

- Exhibit A. Estimated Costs of Inshore Open Water Placement vs. Ocean Disposal for SIDA Facilities

required to enter into contract. Now the estimated costs are even higher than the expenditure in the 1996 dredge project. Even for a facility of the size and character of Harbour Town, this is an unmanageable economic burden.

Agency review comments on previous drafts of this analysis requested justification of economic infeasibility of ocean disposal. The owner of the South Beach Marina asked his Certified Public Accountant to review the estimates prepared by ATM (see Exhibit A) and compare them to the financial data of the business operation conducted at the marina. The accountant's findings conclude that just the operational costs of the ocean disposal program will put the facility out of business (see attached letter dated 27 July 2000).

In addition to the complex logistics and related high costs for dredging and disposal, the Port Royal ODMDS is no longer designated by the USEPA. Any permits that are issued by Charleston USACE District for use of the site are on an individual basis (single event for one facility) and short-term (typically 3 years). This regulatory scenario will not achieve the goal of obtaining a permitted predictable long-term management plan (with limited periodic testing requirements) for a group of facilities. Ocean disposal is only feasible at this time as a one-time, heavily contingent, and exceedingly expensive emergency alternative until a feasible long-term management alternative can be implemented. It is not a practicable (feasible) alternative for the Applicant's project.

A recent development will likely prevent all but Port and federal use of ocean disposal sites until the ocean dumping regulations are rewritten. USEPA Region II was recently sued by an environmental group for permitting disposal operations based on the testing framework established in the Green Book. In this case the judge gave precedence to the strict wording of the out-dated Ocean Dumping Act over the scientific developments since the late 1970s and the congressionally-approved testing manual for carrying out testing and disposal decisions. The judge's interpretation suggests that the detection of *any* bioaccumulative and prohibited compound in the dredged material *requires* bioaccumulation testing for each chemical on three species. This means that Tier II is basically eliminated as an alternative and testing must begin with Tier III. This is because modern laboratory methods and regional implementation procedures produce extremely low detection limits for compounds considered bioaccumulative or prohibited under the Ocean Dumping Act. Material extracted from South Carolina estuaries will nearly always have detectable levels of bioaccumulative compounds (which are considered prohibited under the act).

As an example, the EMAP Station (CP94073) in Calibogue Sound sampled in 1994 contained a total PAH concentration of 11.23 ppb and this station represents a fairly clean and uncontaminated site (Hyland et al, 1996). The results of sediment sampling for this project detected extremely low levels of bioaccumulative chemicals at both the extraction sites and the reference areas (ATM, 2000). Chemicals of this type detected included the PAHs: Fluorene and Fluoranthene; dioxins and furans; and organotins.

Ocean placement is (for all intents and purposes) thereby eliminated as a practicable alternative for all but large Port and federal projects until the federal regulations governing ocean dumping are revised. Until new regulations are written that reestablish and update the

procedures outlined in the Green Book, testing requirements will be much too extensive and costly for smaller projects. Laboratory bioaccumulation testing (according to these procedures) for three species on the extraction site material and a reference can easily exceed the total dredging costs for a comparable dredging project utilizing upland placement. This testing is good for only one project for a one-time, short-term permit.

SAVANNAH ODMDS

The Savannah, Georgia ODMDS is located just south of the Savannah Harbor entrance channel, approximately 6 to 7 miles from the Harbor entrance. The site occupies approximately 3,500 acres with an average depth of 37 ft MLW. The Savannah ODMDS is currently designated by the USEPA for continuing disposal. However, the restrictions of the Savannah ODMDS limit disposal to “dredged material from the Savannah Harbor area” (USEPA, 1999). Therefore, material dredged from the SIDA facilities, all located in South Carolina, is not eligible for disposal in the Savannah ODMDS without petition. ATM asked the Savannah Corps District if the Harbor ODMDS could be used for all or part of SIDA’s dredged material and the reply (see letter dated 23 May 2000 from Alan Garrett attached) indicated that site was restricted for Harbor use and required USEPA approval to change the federal register restriction.

The USEPA requires that the Applicant perform a Supplemental Environmental Assessment (EA) to use the site. ATM asked the USEPA what specifically would be required to use the site, change the classification, and about the time frame. Their response (via email) follows:

Any material going to an ODMDS requires complete testing, i.e., all three tiers (including sediment/water column toxicity, bioaccumulation) and assessment of compliance with WQC, the first time it goes to the ODMDS. Subsequent maintenance projects would require a Tier 1 analysis, with additional testing as deemed appropriate or necessary based on the Tier 1. Regarding your question on how long it would take for the Supplemental EA, Notice of Availability, Public Notice of Proposed Rulemaking, and the Final Notice of the Change in Designation, my best guess is about 6 months, if everyone is on board and participating. SIDA would probably need to fund the EA (Doug Johnson, 25 May 2000).

These investigations reveal that while the Savannah Harbor ODMDS is a closer and safer sail from the four the dredging sites, costs would be even higher than the prohibitive Port Royal site. For use of the Savannah Harbor site, SIDA would perform the additional time-consuming and expensive items listed above including a Supplemental EA. The USACE indicated that even if these restrictions were removed, permits would still only be granted for three years.

All of the other problems of prohibitively expensive dredging and disposal costs, logistics, and testing previously discussed for the Port Royal ODMDS also apply to the Savannah ODMDS. In this regulatory, legislative, and political climate, ocean disposal cannot be

considered an alternative except for large federal navigation projects. It certainly is not a practicable (feasible) alternative that is currently available to the Applicant.

OTHER SITES

There are no other designated ocean disposal sites within practicable range for SIDA facilities. Designation of a new ODMDS, specifically for SIDA, is an alternative that is not feasible. The existing sites have been subject to historical study and review and been used for ongoing federal operations. The process of obtaining a new designation would be too costly and time consuming for consideration at this time by SIDA. While the USACE is in the process of designating a deep water Port Royal ODMDS site, the site will not be available for at least another dredging cycle and does not meet the test of practicability for any SIDA members. If the site is located beyond the Baseline (COLREGS) line, all the logistical problems with dredging, dewatering, transportation, and disposal remain. A site located inside the Baseline solves many of these problems, but is regulated under Section 404 of the Clean Water Act and is considered inshore open water disposal rather than ocean disposal. Inshore open water alternatives are evaluated in the next section of this report. Obviously, the Applicant's selected inshore site (Calibogue Sound) is far more practicable and feasible than any inshore site that will be primarily intended for Port Royal harbor dredges.

FURTHER DISCUSSION AND CONCLUSIONS

Several reviewers of the draft version of this report were concerned that when an alternative was considered impracticable because of "cost" that the alternative was only "more expensive," but not prohibitively expensive. Ocean disposal fails the test for long-term practicability in several areas including the cost criterion. It is "prohibitively expensive" to most or all of SIDA members for the management of frequently dredged maintenance material. Two sections of the commentary on the 404 Guidelines are included below to help clarify this issue. The criterion of "cost" for assessing practicability does not include an assessment of the applicant's "financial standing," but alternatives must be "reasonable in terms of the overall scope/cost of the proposed project." Refer to the following comments in the appendix to the Inland Testing Manual.

Alternatives. What is practicable depends on cost, technical, and logistic factors. We have changed the word "economic" to "cost". Our intent is to consider those alternatives, which are reasonable in terms of the overall scope/cost of the proposed project. The term economic might be construed to include consideration of the applicant's financial standing, or investment, or market share, a cumbersome inquiry that is not necessarily material to the objectives of the Guidelines. We consider it implicit that, to be practicable, an alternative must be capable of achieving the basic purpose of the proposed activity.

Economic Factors. A number of commenters asked EPA to include consideration of economic factors in the Guidelines. We believe that the regulation already recognizes economic factors to the extent contemplated by the statute. First, the Guidelines explicitly include the concept of "practicability" in connection with both alternatives and steps to minimize impacts. If an alleged alternative is unreasonably expensive to the applicant, the alternative is not

"practicable." In addition, the Guidelines also consider economics indirectly in that they are structured to avoid the expense of unnecessary testing through the "reason to believe test" (refer to pages 8 and 14 of "Alternatives" in Appendix A to the 1998 Inland Testing Manual).

If ocean disposal were a practicable alternative for SIDA members, it would certainly have been employed by now. Most SIDA facilities have in the past received maintenance dredging permits from both the State of South Carolina and the United States to place their maintenance material in ocean waters. But, because this option is no longer feasible for these facilities for the economic and site closing reasons detailed above, it is not being considered at this time.

In their review of the draft Alternatives Assessment, the USEPA indicated that testing for ocean disposal was cited as being too expensive for SIDA members, but that inshore open water disposal will also require testing. ATM and SIDA recognize that an inshore open water alternative will also require environmental studies and dredged material testing. Testing for inshore open water disposal will be conducted according to the still intact procedures set forth in the Inland Testing Manual. These procedures not only permit but require cost effective tiered testing that commits only those resources necessary to make factual determinations in the lowest possible tier. The available testing results from SIDA facilities and from recent area testing conducted by NOAA and the USEPA under the National Status & Trends Program and the EMAP Estuaries Program, coupled with no significant sources of pollution in the area suggest that factual determinations for these facilities will be reached in Tier II. The testing that has been performed by SIDA to make decisions for an inshore alternative were less than \$90,000 for all facilities combined. This testing will serve as a baseline for the long-term alternative selected and will require only periodic supplemental confirmatory testing in the future. Testing associated with ocean placement at this time is unpredictable and is expected to be in excess of \$100,000 for each facility for *each* short-term emergency dredging event.

The primary impetus for SIDA formation was to utilize a collaborative strategy (often recommended by the permitting agencies) to make the costs of testing possible for *all* member facilities. ATM provided SIDA with an estimate of the costs of testing, hydrography, biological studies, etc. should inshore open water placement be the only viable long-term management alternative. The broad base and representation of the group has permitted them to secure the funds necessary to see this process through to completion. The costs of continuing site management and monitoring will be borne by the stakeholders using the site(s) on a proportional basis (e.g., a charge on a cubic yard basis may be levied by the local assurer to provide for these costs). SIDA understands that all of the costs of testing, regulatory compliance, pre-project environmental studies, etc. must be considered for all alternatives evaluated. But at this time the regulatory-effected costs and uncertainties associated with open water placement under the Clean Water Act are fewer and far more manageable than those associated with ocean disposal under MPRSA. The recent lawsuit referenced above has essentially obsoleted the Green Book and thirty years of science.

Even confined upland placement has become complex from a regulatory standpoint. The discharge is regulated under Section 404 of CWA and is fairly straight-forward, but terrestrial effects pathway issues are not as well understood and don't fit neatly into any existing environmental regulation legislation.

In conclusion, the long-term management costs of inshore open water placement (considered *in toto*) are expensive, but are manageable and can be funded under the SIDA collaboration. In contrast, ocean placement does not allow for long-term management planning; reasonable testing costs that can be borne collectively; long-term testing results; routine and typical excavation, transportation, and disposal techniques; predictable dredging costs; frequent and complete maintenance efforts; and affordable incremental costs. In contrast, the incremental costs of long-term maintenance dredging to a practicable confined upland or inshore open water management alternative are expected to be expensive but affordable to all SIDA facilities. Even without consideration of testing and long-term issues, etc., the dredging, transportation, and placement costs for the ocean alternatives are prohibitive for the SIDA facilities to ever realize a dredging event. In other words, if "forced" to the ocean disposal, the Applicant's facilities will not be dredged and in a relatively short period of time, they will become non-navigable and thereby cease to exist as functioning facilities.

OTHER ALTERNATIVES REVIEWED BY SIDA

During the numerous meetings and discussions with agency representatives over the past two years, SIDA and ATM recognized that an evaluation of upland and ocean disposal situations was necessary but did not cover the complete range of alternatives possible. Therefore, other alternatives were identified and reviewed.

Specifically, SIDA and ATM were requested to study the possible application of alternative dredging technologies (as distinguished from site selection). This would include methods such as Soloman Technologies' "STI" and also DRE's "Dry DREdge" technologies. In addition, methods such as wetlands restoration, wetlands creation, and wetlands nourishment (marsh spray) were reviewed. These possibilities are now reviewed and discussed (in the above order), within the parameters of the SIDA dredging project for which this application is filed.

ALTERNATIVE DREDGING TECHNOLOGIES

The use of alternative technologies was initially thought by the Applicant and its consultant, ATM, to be outside the range of the definitions of "practicable" in the federal 404(b) Guidelines and "feasible" in the OCRM Regulations. However, the latest revision (May 1999) of the OCRM Regulations requires "...careful consultation with the Department and other relevant State and Federal agencies" [R.30-12.1(2)(b)] before open water disposal can be seriously considered as an alternative. The interagency review committee and the tiered process set forth for this project in the Planning Document satisfy the "consultation"

requirement, but OCRM has indicated that it interprets the intent of the regulation, which utilized language such as “seriously” and “careful consultation”, requires an explicit discussion of alternative technologies and why they are not “feasible” or “practicable” to serve as part of SIDA’s plan.

The OCRM Regulations define “feasible” as it is used in the Regulations:

Feasible (feasibility) – As used within these rules and regulations (e.g., “unless no feasible alternative exists”), feasibility is determined by the Department with respect to individual project proposals. Feasibility in each case is based on the best available information, including, but not limited to, technical input from relevant agencies with expertise in the subject area, and consideration of factors of environmental, economic, social, legal, and technological suitability of the proposed activity and its alternatives. Use of this word includes, but is not limited to, the concept of reasonableness and likelihood of success in achieving the project goal or purpose. “Feasible alternatives” applies both to locations or sites and to methods of design and construction, and includes a no action alternative.

The 404(b)(1) Guidelines define “practicable” in “Definitions” as follows:

The term “practicable” means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes. 40 CFR Part 230, Section 404(b)(1), Subpart A, §230.3(q).

The Supplementary Information contained in 40 CFR Part 230 also provides significant commentary on the issue of “practicability” and the requirements of alternatives analysis. A significant excerpt from this section is included here in support of the Applicant’s conclusions on its site selection process:

Alternatives: Some commenters objected at length to the scope of alternatives, which the Guidelines require to be considered, and to the requirement that a permit be denied unless the least harmful such alternative were selected. Others wrote to urge us to retain these requirements. In our judgment, a number of the objections were based on a misunderstanding of what the proposed alternatives analysis required. Therefore, we have decided to clarify the regulation, but have not changed its basic thrust. Section 403(c) clearly requires that alternatives be considered, and provides the basic legal basis for our requirement. While the statutory provision leaves the Agency some discretion to decide how alternatives are to be considered, we believe that the policies and goals of the Act, as well as the other authorities cited in the Preamble to the proposed Guidelines, would be best served by the approach we have taken.

First, we emphasize that the only alternatives, which must be considered, are practicable alternatives. What is practicable depends on cost, technical, and logistic factors. We have changed the word “economic” to “cost”. Our intent is to consider those alternatives, which are reasonable in terms of the overall scope/cost of the proposed project. The term economic might be construed to include consideration of the applicant’s financial standing, or investment, or market share, a cumbersome inquiry that is not necessarily material to the objectives of the Guidelines. We consider it implicit that, to be practicable, an alternative must be capable of achieving the basic purpose of the proposed activity. Nonetheless, we have made this explicit to allay widespread concern. Both “internal” and “external” alternatives, as described in the September 18, 1979 Preamble, must satisfy the practicable test. In order for an “external” alternative to be practicable, it must be reasonably available or obtainable. However, the mere fact of ownership or lack thereof, does not necessarily determine reasonable availability. Some readers were apparently confused by the Preamble to the Proposed Regulation, which referred to the fact the National

Environmental Policy Act (NEPA) may require consideration of courses of action beyond the authority of the agency involved. We did not mean to suggest that the Guidelines were necessarily imposing such a requirement on private individuals but, rather, to suggest that what we were requiring was well within the alternatives analyses required by NEPA.

Second, once these practicable alternatives have been identified in this fashion, the permitting authority should consider whether any of them, including land disposal options, are less environmentally harmful than the proposed discharge project. Of course, where there is no significant or easily identifiable difference in impact, the alternative need not be considered to have "less adverse" impact.

Several commenters questioned the legal basis for requiring the permitting authority to select the least damaging alternative. (The use of the term "select" may have been misleading. Strictly speaking, the permitting authority does not select anything; he denies the permit if the guidelines requirements have not been complied with.) As mentioned above, the statute leaves to EPA's discretion the exact implementation of the alternative requirement in section 403 of the Act. In large part, the approach taken by these regulations is very similar to that taken by the recent section 403(c) regulations (45 FR 65942, October 3, 1980). There is one difference; the Guidelines always prohibit discharges where there is a practicable, less damaging alternative, while the section 403(c) regulations only apply this prohibition in some cases. This difference reflects the wide range of water systems subject to 404 and the extreme sensitivity of many of them to physical destruction. These waters form a priceless mosaic. Thus, if destruction of an area of waters of the United States may reasonably be avoided, it should be avoided. Of course, where a category of 404 discharges is so minimal in its effects that it has been placed under a general permit, there is no need to perform a case by case alternatives analysis. This feature corresponds, in a sense, to the category of discharges under section 403 for which no alternatives analysis is required.

Third, some commenters were concerned that the alternative consideration was unduly focused on water quality, and that a better alternative from a water quality standpoint might be less desirable from, say, an air quality point of view. This concern overlooks the explicit provision that the existence of an alternative which is less damaging to the aquatic ecosystem does not disqualify a discharge if that alternative has other significant adverse environmental consequences. This last provision gives the permitting authority an opportunity to take into account evidence of damage to other ecosystems in deciding whether there is a "better" alternative.

Fourth, a number of commenters were concerned that the Guidelines ensure coordination with planning processes under the Coastal Zone Management Act, § 208 of the CWA, and other programs. We agree that where an adequate alternatives analysis has already been developed, it would be wasteful not to incorporate it into the 404 process. New § 230.10(a)(5) makes it clear that where alternatives have been reviewed under another process, the permitting authority shall consider such analysis. However, if the prior analysis is not as complete as the alternatives analysis required under the Guidelines, he must supplement it as needed to determine whether the proposed discharge complies with the Guidelines. Section 230.10(a)(4) recognizes that the range of alternatives considered in NEPA documents will be sufficient for section 404 purposes, where the Corps is the permitting authority. (However, a greater level of detail may be needed in particular cases to be adequate for the 404(b)(1) Guidelines analysis.) This distinction between the Corps and State permitting authorities is based on the fact that it is the Corps' policy, in carrying out its own NEPA responsibilities, to supplement (or require a supplement to) a lead agency's environmental assessment or impact statement where such document does not contain sufficient information. State permitting agencies, on the other hand, are not subject to NEPA in this manner (Appendix A to Inland Testing Manual, Pages 8 and 9; italics added for emphasis).

It is also important to state up-front that the alternative and experimental technologies under discussion here are not *placement* alternatives in the sense of providing for long-term management or other uses of the dredged material, but are alternative dredging technologies to typical hydraulic or mechanical dredging methods.

The benefits of both of these methods must be viewed in light of the lack of available upland confined disposal facilities (CDFs) or unimproved land that can be developed for long-term

management as a CDF. The primary benefits of the technologies under review arises from the elimination of the large volumes of water that must be managed during a typical hydraulic dredging operation. In typical hydraulic dredging events conducted in the Southeast, the dredged material is transported to the CDF as a slurry through a pipeline that is over 85% free water. This excess water must be decanted from the dredged material and returned to the natural system. It is the need to properly manage this water that makes many CDFs so land area intensive.

The use of these technologies as the primary dredging technique for the long-term management of SIDA's dredged material does not meet the practicability test of the 404(b) Guidelines and is not feasible under the OCRM Regulations. A discussion of two experimental technologies that are actually being used on a small scale for special projects follows.

Dry Dredge™

DRE Technologies has developed a modified small-scale clamshell dredging technology to handle many cases where sediment contamination is a problem or where upland disposal areas exist, but cannot handle large volumes of free water. The system uses a seal clamshell bucket at the end of a rigid, retraceable boom assembly mounted on a turret.



Using hydraulic motors, the bucket is forced into the sediment floor and is closed. The boom is then retracted with the “plug” of material. The boom moves the bucket to a small hopper in front of the cab mounted at the front of the floating plant; the bucket is opened; and the material is mechanically moved from the hopper to a positive displacement pump. From there the material is pumped through a pipeline to an upland area for

treatment, disposal, or transport. The material is removed at its *in situ* moisture content with usually less than 5% free water added. For material excavated from the SIDA sites, this translates to about 40% to 80% water content.

The primary advantages of Dry DREdge™ include:

- higher than typical solids concentration at the end of the pipe;
- minimization of sediment resuspension in contaminated areas; and
- very accurate and precise excavation of sediments in contaminated “hot spots.”

Because the Dry DREdge™ technology is still in its infancy and it was designed for very different applications from the ongoing management of relatively large volumes of fine-grained maintenance material coming into the SIDA waterways and basins, it has several key disadvantages for this type of work:

- 1) Low production rate: There are currently two Dry DREdge™ models available. The larger of these has a maximum production of about 35 CY/hr or 560 CY for a 16hr dredge-day. If this rate can be sustained, maintenance projects in the various SIDA facilities may take more than 2 months *each*, which severely hampers the operation of the facilities during dredging and limits the number of events that can be completed in a single year's winter dredging window.
- 2) High cost: In addition to a \$10,000 to \$15,000 mobilization fee, the unit cost for dredging are typically around \$10/CY. When the additional costs of temporary dredged material management and truck hauling costs are added, the cost for this type of work will likely be \$18 to \$20/CY, which is 4 to 5 times higher than comparable projects using existing upland disposal sites, or inland open water disposal.
- 3) Limited material types: Dry DREdge™ has not been tested with the high water content sediments found in Southeastern estuaries, but it is expected that it will work tolerably well even though free water estimates may be low for this condition and resuspension will likely be higher than in other test applications. The technology will not work in the predominantly sandy and hard-packed materials that are found at the entrances to Harbour Town Yacht Basin, Braddock Cove Creek, and Baynard Cove Creek. Additional dredging equipment would have to be mobilized for these areas and high-water content transportation and management will be likely.
- 4) Additional management: Probably the biggest disadvantage of this technology for the Applicant's project is that the material will still require management after it exits the Dry DREdge™ discharge pipeline. These units operate on fairly short line lengths and typically pump to areas adjacent to the excavation operation where the material can be permanently or temporarily stored for later use, treatment, or eventual disposal. The areas being considered in this project do not even have adjacent smaller upland areas suitable for spoil cell construction. While water management is significantly reduced over traditional hydraulic dredging, the material being excavated from these areas is 50% to 75% water *in situ*, which is too wet for easy management or traditional truck-hauling without a drying period.



Truck hauling creates problems in this application as previously discussed. Trucks would be required to run for the greater part of daylight hours for long periods of time. The Community Services Association (CSA) will not permit this level of truck activity on Sea Pines roads (see attached letter from CSA dated 26 March 1999). For one-time or special circumstances, small spoils cells and a single trucking event managed, but as a continuing, long-term solution for all of SIDA's material, this is completely infeasible. For example, for a 30,000 CY maintenance event for Harbour Town, a 4-acre spoil cell would be required with 5 ft high dikes and over 2,000 dump trucks required to remove the material. If that material were moved in one month, over 7 trucks an hour would have to pass through the residential roads of Sea Pines Plantation and US 278 on the balance of Hilton Head Island. The example only illustrates the need for one SIDA facility. Two other marinas and the docks and waterways for at least two other owners' association must be added to this mix. This hauling presupposes an eventual and acceptable long-term location or use for this continuing stream of material.

The truck hauling and eventual disposal location adds significant costs to the on-going project. These costs are expected to be between \$8 and \$10/CY and could be much higher. The costs of truck hauling alone (not to mention the prohibition on the activity; see CSA letter) make the project infeasible for the owners' associations and private marinas, who are participants in this application.

Soloman STI

Another technology that offers some promise for disposal site problems is STI. Like Dry DREdge™, STI seeks to eliminate contaminated sediments' dredging problems by reducing the space requirements of traditional CDFs by reducing the high volumes of water that must be managed. Unlike DryDREdge™, however, STI applies new technology at the end of the pipe instead of on the extraction and transportation end. STI has many advantages over DryDREdge™ for small and one-time operations or for operations involving contaminated sediments. These include:

- the use of traditional hydraulic dredging equipment;
- small permanent or temporary dredged material storage areas;
- reduction of water content to less than *in situ* levels.

STI processing equipment is set up in an area adjacent to the extraction site. It requires about 2,500 SF of upland area for the equipment and more for the temporary storage of the "treated" dredged material. The unit requires 200 amp-3 phase electrical service; a 30 gpm freshwater source; and a 100 gpm water source that can be saline system water. The process has two steps. The first step utilizes a polymer to aggregate and separate the material from a large portion of the water. A second step lowers water content still further using a belt press. This process is much newer than Dry DREdge™ and has not been adequately tested on the fine-grained sediments expected from the SIDA facility sediments, but the promoters of this equipment believe that the material can be taken from the 12% solids at the end of the dredge pipe to about 65-70% solids at the end of the STI process. If these assumptions are accurate, then the material for this project can be reduced in water content and therefore volume from 1.3 to 2.6 times its *in situ* condition. Using the maximum value, temporary storage and management on-site could be handled with under 2 acres of land.

The procedure does however have several problems that make it impracticable for SIDA's use as their primary management option:

- 1) Low production rate: Like Dry DREdge™, the process is necessarily slow. Because all the material must be processed as it exits the hydraulic dredge discharge pipe (there is not intermediate storage; this is what is being eliminated by this technology), the unit can only process 1,000 CY/day maximum. This limits excavation dredges to small models and lengthens the overall dredging time for each maintenance event. As was stated earlier, this severely hampers the operation of the facilities during dredging and limits the number of events that can be completed in a single year's winter dredging window.

- 2) High cost: In addition to a \$10,000 to \$15,000 mobilization fee, the unit cost for dredging are typically around \$11/CY. Similar to DryDREdge™, when the additional costs of temporary dredged material management and truck hauling costs are added, the cost for this type of work will likely be \$20 to \$25/CY. This does not include the electrical service and fresh water that must be supplied during the entire operation. Sea Pines Plantation is already confronting major fresh water restrictions for its residents.
- 3) Return water: Unlike Dry DREdge™ and similar to traditional technologies, the STI process has a significant volume of return water. The water is just removed from the dredged material mechanically and much faster than in a CDF. The STI process has two return water points. The first after the polymer process and the second after belt pressing. The water leaving the first process is expected to be similar to water leaving a CDF and its potential environmental effects can be evaluated utilizing existing protocols (e.g., modified elutriate tests). The return water from the belt press is releasing water that is not typically removed from dredged material and can be thought of as the pore water that is closely associated with the solid material. The belt press water will likely contain a more concentrated level of contaminants than is typically released from dredged material dewatering processes and the means to evaluate the chemical make-up of this water currently do not exist. The water can be significantly diluted by combining it with the discharge water from the first process, but contaminant levels are still expected to be higher than predicted by elutriate testing. Thus the obvious question: Where to dispose of this return water?
- 4) Experimental nature of equipment: One of the biggest problems with considering STI as a part of the primary long-term solution to SIDA's dredged material management is the experimental nature of the technology. It has not been adequately tested on these sediments and was not designed for a continuing high-volume application such as this one. Inherent in the definitions of "practicable", "feasible", and "long-term" are the ability of SIDA members to depend on the long-term availability of the technology; to competitively bid the work at each maintenance interval; and to have some assurances that after this lengthy and expensive investigation and permit process it can conclude that the technology will perform as envisioned and that there is normal recourse for change if it does not. ATM does not believe that STI can pass this type of test. Only readily available, existing technologies with enough redundancy in the market can meet these requirements.
- 5) Additional management: Again, as with Dry DREdge™, the biggest disadvantage of this technology for this application is that the material will still require management after it leaves the STI process. Even if the process works as planned and material has the water content and consistency of soil and does not require a confined storage area, the areas being considered for this project do not have adjacent smaller upland areas suitable for material storage. And, most importantly, the material will have to be trucked to some location for permanent disposal or use. The trucking is infeasible, and a dependable long-term disposal area must be secured.

Conclusion

The only reasonable conclusion from this review is that neither of these new dredging procedures can be a practicable (feasible) alternative for use in the Applicant's project.

ALTERNATIVE PLACEMENT TECHNOLOGY

The dredged material could be suitable for wetlands restoration, creation, or nourishment. The coarser-grained material may be used around the area margin to provide shore protection and provide for fine-grained material control during placement. The fine-grained material, which makes up the bulk of the project sediments, and long-term maintenance material could be used to elevate subtidal or intertidal areas to support marsh grasses or it could be sprayed on adjacent marshes as to elevate areas that have subsided using thin layer placement. Of these options, SIDA believes only marsh creation has any potential for alternative retention and further evaluation.

While marsh restoration would be an excellent opportunity and environmentally positive use of the material, the vegetated salt marsh region in the southern part of Hilton Head Island has not undergone significant perturbation where restoration may be accomplished. Wetland habitat that has been destroyed for the Island's predominantly residential uses usually involved the creation of islands in marsh with dredged material fill, or filling the upland margin to expand it into the marsh. Any areas of this sort that could be restored would require the removal of fill and provide no use for long-term dredged material management.

Additionally, the expansive vegetated intertidal wetlands in the area appear to be accreting material and are not suffering the subsidence that is often seen in river deltas where material is removed from the river system upstream by dredging. Spraying dredged material on the active vegetated marsh would therefore not serve as a beneficial use and creates significant logistical and potential adverse environmental impacts. The placement of dredged material in the active salt marsh is the alternative of least preference in the OCRM Regulations. See OCRM R.30-12(l)(2)(e).

This leaves vegetated salt marsh creation from other natural habitat for a closer examination. In this case, unvegetated intertidal areas or low energy subtidal areas could be elevated to the upper third of the normal diurnal tide range and planted with *Spartina alterniflora* after a sufficient period of sediment consolidation. An alternative of this type cannot serve as a long-term management site because of the nature of the project. A suitable area must be located and a definite amount of fill is placed in that area to accomplish the plan specifications. Once the fill is placed and the vegetation planted, the project is complete and no additional dredged material can be placed. This type of alternative is by its very nature a temporary one-time beneficial use option and can only be considered as part of a larger long-term plan with suitable high-capacity sites. SIDA must still be authorized to deposit the balance of its dredge spoils in an alternatives location. However, the following discussion considers the possibilities of this method in the SIDA project.

Vegetated Salt Marsh Creation

An additional evaluation by SIDA's consultants examined the potential for the creation of vegetated salt marsh habitat as a potential beneficial use of a portion of the long-term

maintenance material generated by SIDA facilities. Successful salt marsh creation requires that several key factors be considered and handled properly in construction. These include:

- an appropriate location with suitable pre-project depths, large enough spatially, close to the extraction sites, in a low wave energy area (or one that can be effectively protected from high energy conditions), and accessible and workable with construction equipment;
- a workable construction plan for the filling operation, the post fill grading, and post fill vegetating effort; and
- a careful evaluation of the ecological condition now existing at the proposed site and the one replacing it.

Location and Capacity

An evaluation of potential sites in the vicinity of the SIDA facilities (see Figure 2 in the Alternatives Assessment) revealed only one location of the size and proximity necessary for a consideration of this activity. This area is a small “embayment” along the Hilton Head marsh margin between Harbour Town and the entrance to Baynard Cove (see Figure 3 for location of this area). The area is approximately 31 acres. With depth information contained

- Figure 3. Potential Marsh Creation Site

on the navigational charts and three small surveys of the site in March 2000, it probably could hold approximately 180,000 CY of both fine and coarse-grain dredge material.

NOAA reports an average tide range in the area of approximately 6.7 ft. The existing salt marsh grasses along the eastern border of this proposed site are growing at approximately 1 ft below MHW (i.e., 5.7 ft MLW) and can be expected to survive down to approximately 4.5 ft MLW. For effective creation and maximal use of available dredged material, the site would be elevated as high as possible without exceeding the elevation of the adjacent naturally vegetated area. Assuming an average fill depth over the entire 31 acres of 4.7 ft and a dredged material expansion factor of 30% suggests a maximum fill volume of approximately 180,000 CY. This site, if retained for further evaluation, would be able to accommodate approximately 80% of the estimated material to be removed in the initial effort and none of the future maintenance material. The 45,000 CY remaining from the initial effort would be predominately fine-grained and would have to be placed in the inshore deep-water site. All of the coarser-grained material would be required to build temporary marginal dikes for fill control and for protection of the new marsh margin from near field waves, boat wakes, and ocean swell.



Besides capacity and ecological issues (discussed below), the location also presents other concerns that must be further addressed before a construction plan could be developed. The small embayment along this shoreline suggested it as a possible location, but why is this area not vegetated now? Near field wave focusing and impacts from long-period ocean swell may create a condition in this area that could make it very difficult to protect the marsh once created. The existing marsh is protected primarily by a broad intertidal mudflat and secondarily by live and dead oyster beds and a shelly beach along parts of the vegetated margin. The currents and deep water of the Calibogue sound do not permit the reconstruction of this mudflat along the new margin, so a hard solution such as a rock revetment may be necessary to protect this new area from waves. Such a solution, however, would likely be too expensive to make it feasible for this project. An effective rock rubble revetment along this new margin could cost in excess of \$500,000, if permitted.



Construction and Logistics

It is expected that the construction of a vegetated salt marsh in the area proposed would present several difficulties for both the marsh construction plan developer and the construction contractor. The larger issues involve fill control during placement and protection of the new marsh margin from wave activity. For the placement to be cost-effective, fill controls must utilize the dredged material available to construct a temporary dike along the new waterward margin that would be fitted with one or more weir boxes during construction. Ideally, this dike would extend around the entire proposed area so that fill control can be extended to protecting the existing vegetated salt marsh resource. It is, however, unlikely that sufficient coarse-grained material exists to build a dike around the entire area



or that the dredging contractor can provide the type of surgical placement necessary to build this dike. The existing soils would make it extremely difficult to place the material with the dredge pipe and then subsequently rework it with heavy equipment. The dike along the new margin could be lowered after filling is finished by working from a barge. The weir boxes could be removed in a similar fashion. The dike along the existing marsh margin would however be “landlocked” and difficult to rework with heavy equipment after filling operations are complete. Fill retention along the existing marsh boundary would need to be accomplished using the existing elevation and shell faces. While the filling operation could be closely observed to ensure that this area would be minimally impacted, the risk to this resource must be considered.

After the design elevation has been achieved and a sufficient period of time allowed for dewatering and densification of the material placed, the dikes along the margin would be lowered to permit the natural movement of tidal waters over the entire area at high tide. The material cut down would be placed along the waterward slope of the dike to flatten it out and provide additional shore protection for the marsh.

The marsh area would then be planted from a flat bottom boat that draws very little water along a suitable planting grid with nursery stock *Spartina alterniflora*. Planters may also be able to work at lower tides with mats if the material densifies enough to permit this practice. Natural propagation can also be expected to occur from seeds and from rhizoming of the adjacent stock.



Ecology and Regulations

While saltmarsh habitat is often considered in the classical literature of the field to be one of the most important and productive habitats in the world, careful consideration must be given to the natural habitat that is being replaced and the regulations governing it. The Low Country in this region is dominated by active vegetated salt marsh and the creation of additional habitat of this type is not expected to serve any immediate natural resource

management needs of the local stewards of this environment. The existing habitat in this area (see the navigation chart #11516 and the Bluffton quadrangle) is dominated by intertidal mudflat and to a lesser degree subtidal shallow water soft bottoms flats.

The Environmental Sensitivity Index (ESI) Maps covering this area indicate that this area is important to shellfish and birds and that it is also important to juvenile fishes. While vegetated intertidal salt marsh is not particularly threatened, expansive active intertidal mudflats are extremely important and this habitat is not nearly as abundant as the proposed vegetated marsh that would replace it. During the reconnaissance level field surveys conducted in March 2000 to better understand this area and its potential as a marsh creation site, significant live oyster reef was observed at low tide, together with diverse and abundant shore birds feeding on the flat.

Secondly, the OCRM Regulations recognize the importance of intertidal mudflat habitat and the potential sensitivity of this system to dredged material placement. The regulations clearly do not permit the placement of dredged material in mudflats when upland or deep-water placement alternatives are available. This regulation would also cover the marsh spray alternative that was rejected above.

Deposition of Dredged Material

(a) Upland disposal of dredged material shall always be sought in preference to disposal in wetlands. Vegetated wetlands and mudflats shall not be utilized for disposal of dredged material unless there are no feasible alternatives. Any other wetlands should not be utilized for disposal of dredged materials when other alternatives exist;

(b) Open water and deep water disposal should be considered as an alternative if highland alternatives are not feasible. However, open and deep-water disposal sites should be seriously considered only after careful consultation with the Department (OCRM) and other relevant State and Federal agencies.

The only conclusion to be derived from this review is that vegetated salt marsh creation is not an available option to SIDA.

SUMMARY OF ABOVE ALTERNATIVES

This section of the Site Selection document has reviewed the use of new, alternate dredging technologies, and also the potential for beneficial use of the dredged materials for salt marsh restoration and creation. The conclusion is that neither of these opportunities is a satisfactory solution to the question of where to deposit the spoils from SIDA's project. The marsh creation alternative suggested greater promise because of an adjacent area to the sites to be dredged that could potentially be used for placement of spoils, and beneficial uses should always be sought, but the displacement of existing habitat, the clear implications of the Regulations, and the construction-related issues do not result in a positive option for this process.

Beach Placement Alternative

During ATM's study of the sites to be dredged under this application, it was determined that there are areas at the mouth of the channels into both Braddock Creek and Harbour Town Yacht Basin in which the accumulated deposits are coarser-grained materials. Following a recommendation from the interagency meetings conducted during the site selection studies, ATM fully evaluated a beach placement for these coarser-grained materials, as an alternative to commingling them with the finer-grained (silt and clay-sized) materials to be pumped into the open waters of Calibogue Sound.

The sites selected from the ATM survey are along the shoreline of Calibogue Sound at locations oceanward (but adjacent to) the excavation sites at the mouths of Braddock Creek and Harbour Town's entrance channel. Placing the material oceanward (i.e., downdrift) of the excavation site effectively bypasses littoral drift sediments, and thus benefits the downdrift shorelines. Beach profile nourishment is the beneficial result. SIDA has therefore included two beach profile nourishment sites as feasible alternatives in the permit application. This alternative has been discussed with regulatory and resource agencies and was received positively.

INSHORE OPEN WATER (404) DISPOSAL

Since neither upland nor offshore sites are practicable for the fine-grained maintenance sediments that represent the bulk of the cyclical maintenance burden, the remaining alternative (per the Guidelines), is inshore open (deep water) disposal. The advantages of open water disposal, for example in the deep channel area of Calibogue Sound, include both logistical and cost parameters. The selected locations for open water disposal in Calibogue Sound will be as close to SIDA facilities as possible while still minimizing any potential environmental impacts, which eliminates the requirement for double handling of dredge materials and multiple contractors. This alternative also requires a minimum of submerged pipeline, which (for protected water applications) is more costly for the contractor to maintain than typical floating pipeline. The ideal open water site is also inshore of the Baseline of the Territorial Sea (COLREGS line), avoiding the need for US Coast Guard certified ocean going equipment. Specification of sites inside the COLREGS line also changes the regulatory authority of the operation from Section 103 of MPRSA to Section 404 of the Clean Water Act (CWA). Cost savings are realized as a result of the logistical benefits as well as costs associated with the development and maintenance of an upland CDF. There will however be ongoing costs associated with site management and monitoring. It should also be noted that this is the *only* alternative class of dredge disposal that has complete national guidance documentation—that is, the aforementioned Inland Testing Manual (USEPA/USACE, 1998a).

ALTERNATIVES MATRIX AND SELECTION

In order to summarize and compare the results of the alternatives analysis, a matrix was attempted with a numerical ranking of each factor compared. However, the appropriate weighting factors for each criteria were difficult to apply (i.e., since most of the alternatives were included/omitted based on legal and technological criteria). The quantitative matrix was abandoned and a qualitative matrix was developed to summarize the results of this study in a convenient tabular format.

SIDA Dredge Disposal Alternatives Evaluation Matrix

Alternatives	Technological				Legal	Social	Environmental		Economic	
	Long Term Capacity	Equipment Needs	Operation Logistics	Site Access	Availability & Ownership	Aesthetics	Regulatory Preference	Environmental Issues	Site Development Costs	Dredging Costs
1. Upland Disposal										
a. Lawton Stables Tract	X	M	M→L	L	X	L	H	M	M→H	M
b. Calibogue Cay CDF	L→X	M	M	M	X	L	H	M	M→H	M
c. Other Areas – HHI	X	M	L→H	M	X	M→L	H	M	H	M
d. Buck Island	X	M	M	M	X	M	H	M	M→H	L→M
e. Barataria and Bull Isl.	L→H	M→H	M→L	L	X	M	H	M	H	M→H
f. Haig Point	X	M→H	M→L	L	X	M→L	H	M	H	M→H
2. Ocean/Offshore Disposal										
a. Port Royal ODMDS	H	H	L	M	L	H	M	L	M	H
b. Savannah ODMDS	H	H	L	M	X	H	M	L	M	H
c. New Designation	H	H	L	M	L	H	M	L	H	H
3. Open Water Disposal										
a. Calibogue Sound	H	L	H	H	H	M	L	M	L→M	M
b. Nearshore Profile Nourishment	H	L	H	H	M	M	H	H	L	M

Matrix Notes:

Long Term Capacity: L-minimum/short term, M-moderate, H-long-term
 Equipment Needs: L-minimum, M-typical land and sea, H-multiple contractors/means
 Operation Logistics: L-most difficult, M-typical dredge/disposal, H-least difficult
 Site Access: L-difficult/limited access, M-sufficient access/typical, H-easiest access
 Availability/Ownership: L-unlikely use, H-likely use
 Aesthetics: L-poor, M-acceptable/typical social concern, H-no objections
 Regulatory Preference: L-third option, M- second option, H-first option
 Environmental Issues: L-most difficult/involved to permit, M-moderate permitting effort
 Site Development and Dredging Costs: L-least expensive, M- typical costs, H-most expensive
 X- not a possibility (all criteria)

In their response to the draft version of this document, the US Fish and Wildlife Service (USFWS) commented that beyond cost, logistics, and technical criteria; the overall goal of the 404 Guidelines is to select the *least environmentally damaging alternative*. The program adopted by SIDA was designed to designate the *least environmentally damaging practicable alternative* as a long-term management plan. Because the OCRM Regulations consider upland CDF placement and ocean disposal less damaging *a priori*, this document considered alternatives in these categories first. Inshore open water placement is being

considered because there are *no other practicable long-term dredged material management alternatives*. Inshore open water placement is the least environmentally damaging practicable alternative. The program laid out in the Planning Document recognizes that it must be shown that this alternative will not “contribute to significant degradation of water of the U.S.” But, it also must be remembered that “significant” is not here being used in the statistical sense. The following excerpt is from the EPA’s commentary on the 404 Guidelines:

Section 230.10(c) provides that discharges are not permitted if they will have “significantly” adverse effects on various aquatic resources. In this context, “significant” and “significantly” mean more than “trivial”, that is, significant in a conceptual rather than a statistical sense. Not all effects which are statistically significant in the laboratory are significantly adverse in the field. See Page 15, Other Requirements for Discharge, in Appendix A to the 1998 inland Testing Manual.

SUMMARY

The Applicant has considered and reviewed all potential sites located within a reasonable geographical area surrounding the sites to be permitted under this application. The Calibogue Cay POA has determined that the use of their CDF by any SIDA members for even a portion of the material requiring management would reduce the overall capacity of the site for the future management of Calibogue Cay dredged material and will therefore not consider amending the covenant restrictions to permit this use. The Lawton Stables Tract is not available as an alternative to any SIDA member for the reasons discussed above for any portion of member dredged material needs. There are no other upland property(ies) of sufficient size that are available to SIDA members for new site development. As discussed above, potential upland sites located on neighboring islands are not available due to refusals by the owners.

The Applicant, through its consultant ATM has identified an alternative (i.e., beach profile nourishment; placement of sandy material in the water column in front of adjacent beaches) that may be practicable for Harbour Town, South Beach, Gull Point, and the Baynard Creek POA for a portion of their dredged material. ATM suggests that since this alternative is not feasible for all of the proposed dredged material, that it be pursued concurrently with the inshore open water placement option. The confluence of each of these facility’s approach channels with Calibogue Sound suffers a sand shoaling problem consistent with normal alongshore transport of sandy material along beaches. This shoaling problem is actually the most critical component of facilities’ maintenance. Sometimes as soon as a year following maintenance dredging, this shoaling can reduce navigability of these entrances. It appears that this material may be compatible with the sand on adjacent non-recreational beaches and that dredged material from these shoals can be “artificially bypassed” by dredging and placement on adjacent downdrift beaches or in the nearshore area in front of these beaches. Environmental requirements such as grain size must be studied and addressed and technical issues such as material thickness and the practical segregation of the sand from the fine-grained material using a hydraulic dredge must also be addressed. This

alternative will permit the periodic and inexpensive “reopening” of the entrances between normal maintenance events. A small dredge could be mobilized to complete both jobs every two years, or as required. The Applicant includes this alternative within its application for a permit.

Filed prior to SIDA's permit application was a two-volume report prepared by ATM entitled, “Dredged Material Environmental Effects Evaluation, SIDA LTMS, Calibogue Sound, Hilton Head, SC.” This report provides detailed results of the sample analyses of the sediments to be excavated from the project sites. Also, a modeling study of the disbursement of the dredge plume as projected to be pumped into 404 sites in Calibogue Sound is an attachment to the application.

SIDA has conducted thorough studies of the characteristics of the bottom sediments and benthic epifaunal and infauna in Calibogue Sound. They have amply considered available documentation of marine life and cycles in Calibogue Sound. Currents, tidal flows, water temperatures during proposed dredging periods, and other relevant data have been collected and studied to ascertain the results of this proposed inshore disposition of dredge materials.

The ATM studies reasonably and soundly conclude that there will not be any materially adverse effects to the waters of Calibogue Sound, or to the marine and vegetation life in Calibogue Sound, if SIDA members are granted a permit to dispose of their dredge materials into these 404 waters. SIDA submits that it has fully complied with all requirements of Section 404(b)(1) of the Clean Water Act, the Inland Testing Manual, and applicable OCRM Regulations, and is fully qualified to receive the permit in accordance with its pending application.

An intensive Sound mapping investigation was conducted to determine the best and least impactive areas for material placement. The investigation included both remote sensing techniques and direct benthic sampling of the Sound bottom. A bathymetric survey and complete sidescan sonar coverage of over 1,200 acres was conducted. From this, seven potential habitat zones were established and each represented by at least 8 benthic grab samples taken with an approved modified Young-type device. Additionally, potential live hardbottom areas were trawled with an oyster dredge to determine the extent of larger sessile epifaunal organisms. From these data, two deeper water open-water sites were selected for proposed dredged material discharge. Placement by near-surface underwater hydraulic discharge was modeled for dispersion and fate. The proposed locations of the selected sites are illustrated in the permit application drawings.

SIDA further submits that the requested 404 open water sites in Calibogue Sound are the only practicable, feasible disposal sites available for the proposed dredging projects under this application. Considering all factors that comprise “practicable” under the federal Guidelines and “feasible” under the South Carolina OCRM Regulations, this is the only reasonable conclusion to be reached when the permitting agencies make a final decision on this application. Further, to deny this application will result in continuing accumulation of silt

materials in the proposed sites, such that navigation will soon become impossible except on the very high tide periods, which is contrary to the public interest and would be violative of the standards established in applicable federal and state laws, rules and regulations.

SIDA recognizes the need for, and accepts responsibility for, a reasonable monitoring program, both throughout the actual dredging project and for a reasonable time period thereafter, in order to provide all interested parties with confirming data that the project has not materially impacted the environment and waters of Calibogue Sound. Modeling programs prepared by ATM provide an excellent delineation of the necessary parameters of those monitoring studies required to achieve the necessary goals. The data and information derived will be invaluable when evaluating future projects - for SIDA or for other applicants - that are proposed under the inland open-water rules and regulations.

FINAL CONCLUSION

SIDA has conducted a study that fully exhausts all possible alternatives for site selection under this dredging permit application. It has also engaged highly qualified consultants to examine and determine the effects of the proposed inland open water disposal of the materials to be dredged.

One must conclude that SIDA does not have any other practicable or feasible disposal site available, applying the regulatory definitions that are applicable to this application.

The scientific studies also require a determination that the placement operation can be conducted and the site managed so that there will not be any unacceptable adverse effects to the waters and marine environment if the permit is granted and the project is implemented.

SIDA therefore submits that the application should be granted, and all necessary permits to proceed (federal and state) should be granted.

REFERENCES

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ATM (2000). Dredged Material Environmental Effects Evaluation: SIDA LTMS, Calibogue Sound, Hilton Head, SC. Report prepared for the South Island Dredging Association by Applied Technology and Management, Inc., Charleston, SC, Draft: 28 April 2000.

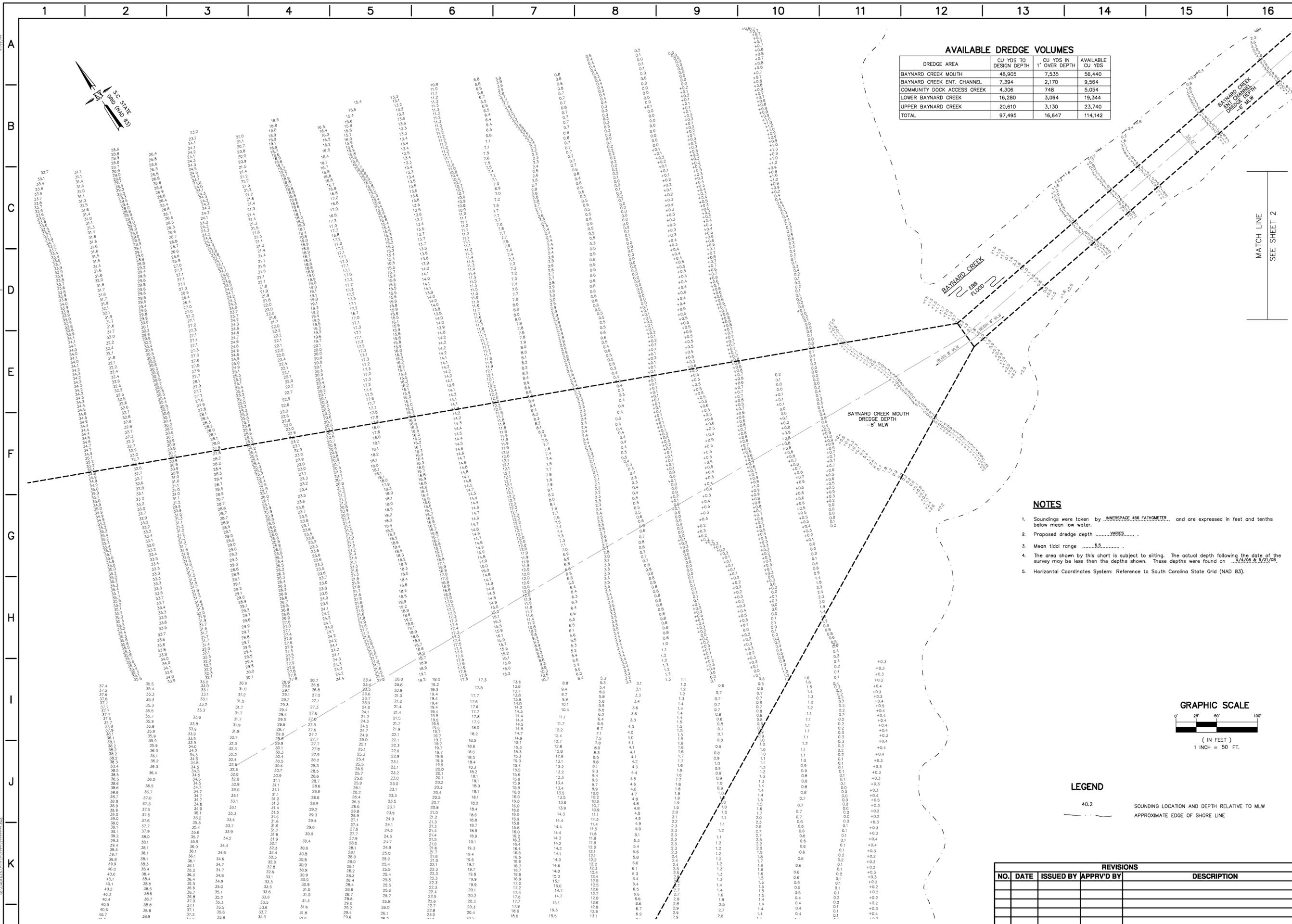
- Hyland, J.L., T.J. Herrlinger, T.R. Snoots, A.H. Ringwood, R.F. Van Dolah, C.T. Hackney, G.A. Nelson, J.S. Rosen, and S.A. Kokkinakis (1996). Environmental Quality of Estuaries of the Carolinian Province: 1994. (Annual Statistical Summary for the 1994 EMAP-Estuaries Demonstration Project in the Carolinian Province). NOAA Technical Memorandum NOS ORCA 97. Charleston, SC, July, 1996.
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- USEPA (1999). Ocean Dumping Sites Designated on a Final Basis. Office of Water internet website, accessed 31 March 1999.

APPENDIX - RELEVANT CORRESPONDENCE
(LETTERS INCLUDED)

<i>AUTHOR</i>	<i>RECIPIENT</i>	<i>DATE</i>
CSA	SIDA/Richard Sonberg	July 1, 2000
Sea Pines Company/Thomas Norby	SIDA/Richard Sonberg	August 14, 2000
CSA	ATM/W. Samuel Phlegar	March 26, 1999
Calibogue Cay/Robert M. Willock	SIDA/Richard Sonberg	June 30, 1999
Calibogue Cay/Robert M. Willock	SIDA/Richard Sonberg	May 10, 2000
Vaux & Marscher/William Marscher	SIDA/Richard Sonberg	June 22, 2000
Welles Murphey, Jr.	SIDA/Richard Sonberg	March 24, 1999
A.L. Loomis, III	SIDA/Richard Sonberg	May 4, 2000
Haig Point/Benny K. Jones	SIDA/Richard Sonberg	April 5, 1999
CESAS/T. Alan Garrett	ATM/Robert H. Semmes	May 1, 2000
Sutton/Brian Sutton, CPA	South Beach Marina/Alan Pollard	July 27, 2000
CESAS/T. Alan Garrett	ATM/Robert H. Semmes	May 23, 2000

APPENDIX II

GEL Hydrographic Survey



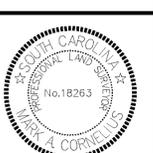
AVAILABLE DREDGE VOLUMES

DREDGE AREA	CU YDS TO DESIGN DEPTH	CU YDS IN 1' OVER DEPTH	AVAILABLE CU YDS
BAYNARD CREEK MOUTH	48,905	7,535	56,440
BAYNARD CREEK ENT. CHANNEL	7,394	2,170	9,564
COMMUNITY DOCK ACCESS CREEK	4,306	748	5,054
LOWER BAYNARD CREEK	16,280	3,064	19,344
UPPER BAYNARD CREEK	20,610	3,130	23,740
TOTAL	97,495	16,647	114,142

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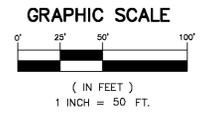
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 2400 Savage Road
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**PRE-DREDGE HYDROGRAPHIC SURVEY
 BAYNARD CREEK &
 BAYNARD CREEK COMMUNITY DOCK**
 LOCATED ON HILTON HEAD ISLAND
 BEAUFORT COUNTY, SOUTH CAROLINA



MARK A. CORNELIUS
DATE SURVEYED
 MAY 21, 2008
LAST REVISED
DRAWN/CHECKED
 MAC
APPROVED
 MAC
SCALE
 AS SHOWN
PROJECT NUMBER
 SIDAO0208C
SHEET NUMBER

- NOTES**
1. Soundings were taken by INTERSPACE 458 FATHOMETER and are expressed in feet and tenths below mean low water.
 2. Proposed dredge depth VARIABLES.
 3. Mean tidal range 6.5.
 4. The area shown by this chart is subject to silting. The actual depth following the date of the survey may be less than the depths shown. These depths were found on 5/24/08 & 5/21/08.
 5. Horizontal Coordinates System: Reference to South Carolina State Grid (NAD 83).



LEGEND

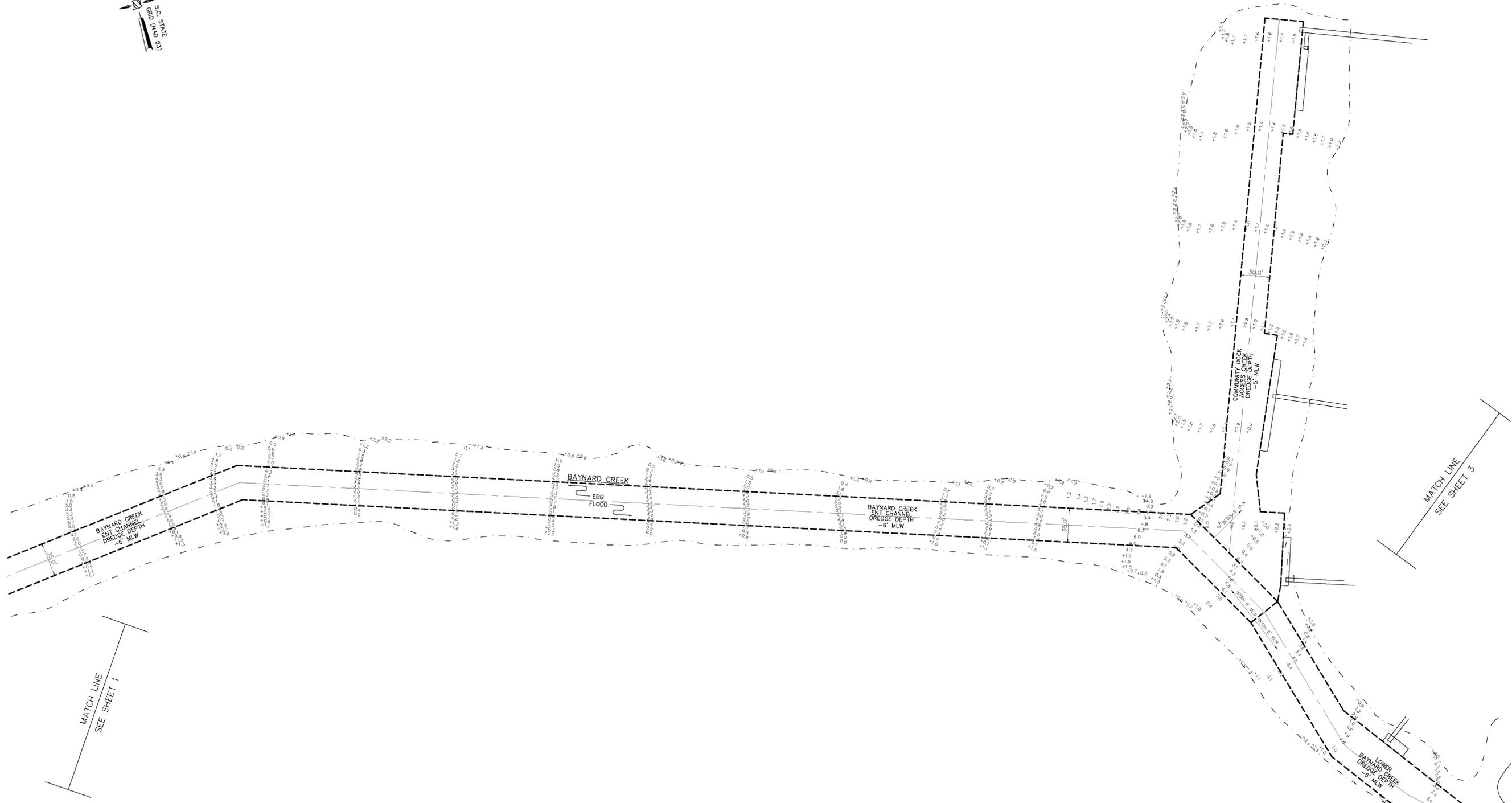
40.2 SOUNDING LOCATION AND DEPTH RELATIVE TO MLW
 APPROXIMATE EDGE OF SHORE LINE

REVISIONS

NO.	DATE	ISSUED BY	APPR'V'D BY	DESCRIPTION

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MATCH LINE
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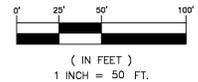
NOTES

1. Soundings were taken by INNERSPACE 456 FATHOMETER and are expressed in feet and tenths below mean low water.
2. Proposed dredge depth VARIES.
3. Mean tidal range 6.5.
4. The area shown by this chart is subject to siltting. The actual depth following the date of the survey may be less than the depths shown. These depths were found on 4/4/08 & 5/21/08.
5. Horizontal Coordinates System: Reference to South Carolina State Grid (NAD 83).

LEGEND

- 40.2 SOUNDING LOCATION AND DEPTH RELATIVE TO MLW
- APPROXIMATE EDGE OF SHORE LINE

GRAPHIC SCALE



REVISIONS

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MARK A. CORNELIUS

DATE SURVEYED

MAY 21, 2008

LAST REVISED

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MAC

SCALE

AS SHOWN

PROJECT NUMBER

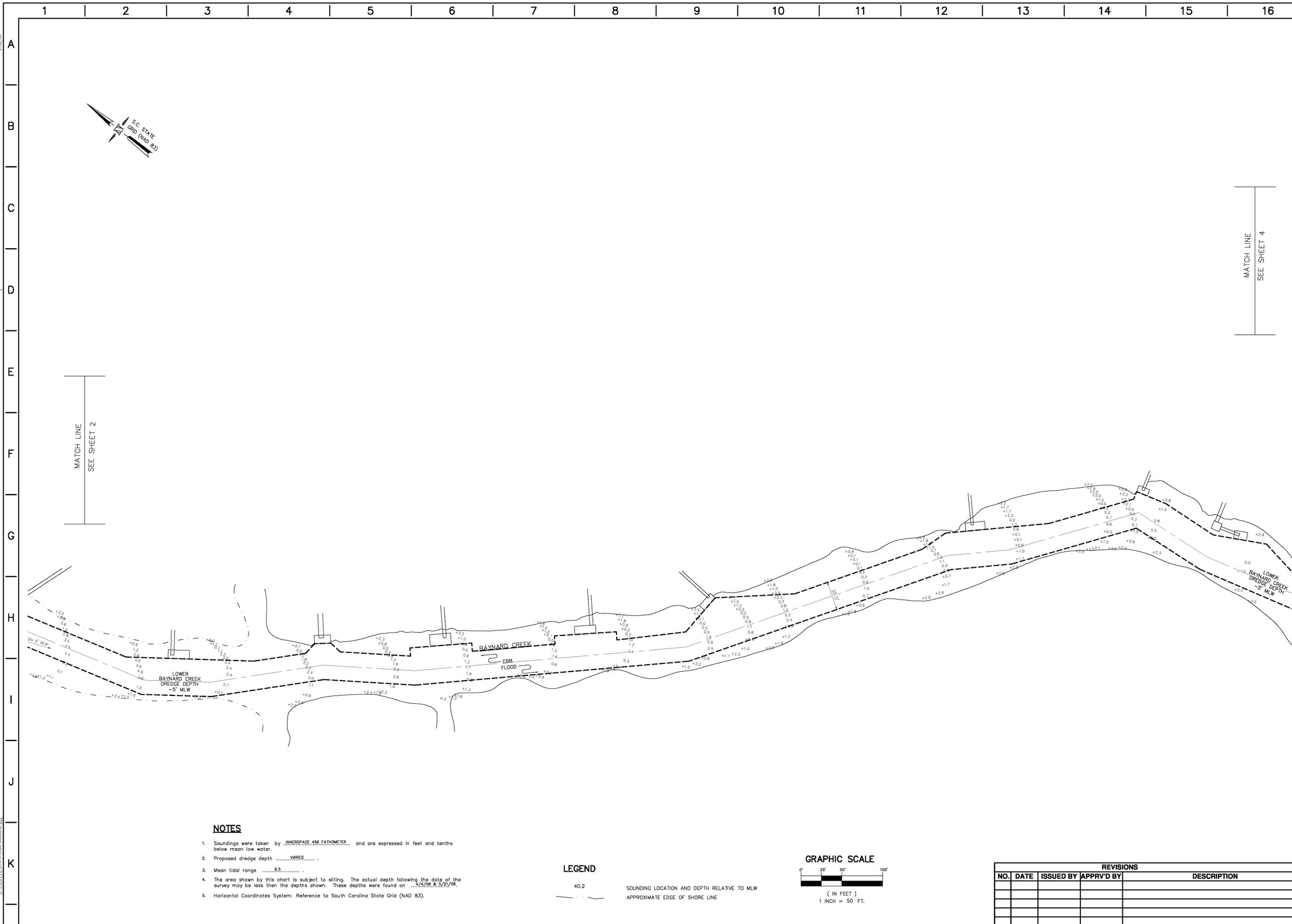
SIDA00208C

SHEET NUMBER

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OF 5

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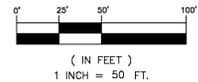
NOTES

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LEGEND

- 40.2 SOUNDING LOCATION AND DEPTH RELATIVE TO MLW
- APPROXIMATE EDGE OF SHORE LINE

GRAPHIC SCALE



REVISIONS				
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SCALE

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PROJECT NUMBER

SIDA00208C

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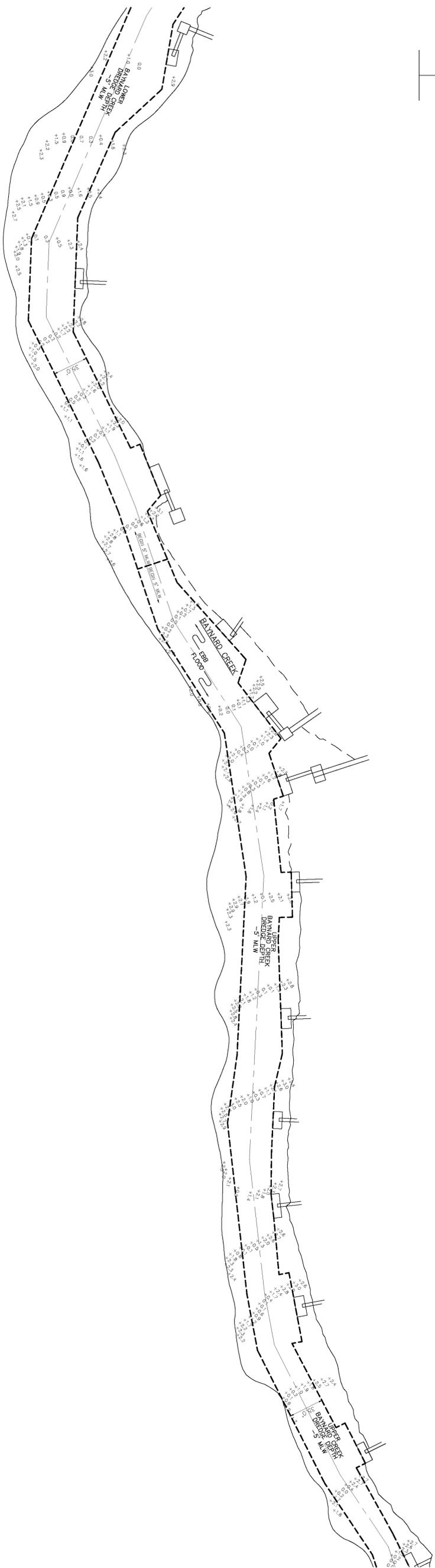
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MATCH LINE
SEE SHEET 3

MATCH LINE
SEE SHEET 5



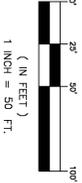
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2. Proposed dredge depth WISE.
3. Mean tidal range 6.8'.
4. The area shown by this chart is subject to filling. The actual depth following the date of the survey may be less than the depths shown. These depths were found on 1/1/2008 & 3/2/08
5. Horizontal Coordinates System: Reference to South Carolina State Grid (NAD 83).

LEGEND

- 40.2 SOUNDING LOCATION AND DEPTH RELATIVE TO M.L.W.
- APPROXIMATE EDGE OF SHORE LINE

GRAPHIC SCALE



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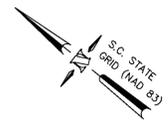
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PRE-DREDGE HYDROGRAPHIC SURVEY
BAYNARD CREEK & BAYNARD CREEK COMMUNITY DOCK
LOCATED ON HILTON HEAD ISLAND
BEAUFORT COUNTY, SOUTH CAROLINA

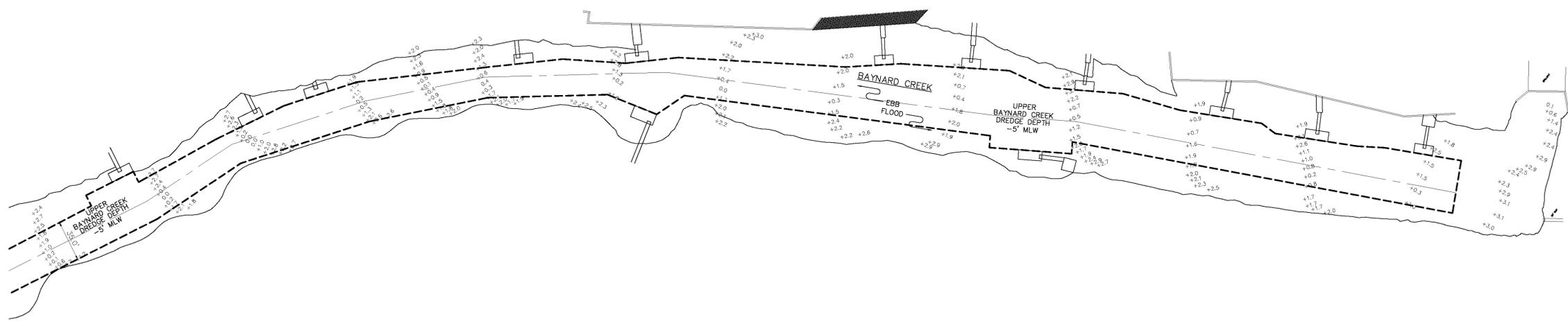
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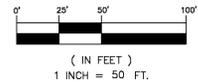
NOTES

1. Soundings were taken by INNERSPACE 456 FATHOMETER and are expressed in feet and tenths below mean low water.
2. Proposed dredge depth VARIES.
3. Mean tidal range 6.5.
4. The area shown by this chart is subject to silting. The actual depth following the date of the survey may be less than the depths shown. These depths were found on 4/4/08 & 5/21/08.
5. Horizontal Coordinates System: Reference to South Carolina State Grid (NAD 83).

LEGEND

40.2 SOUNDING LOCATION AND DEPTH RELATIVE TO MLW
 --- APPROXIMATE EDGE OF SHORE LINE

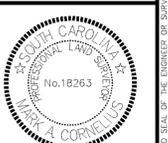
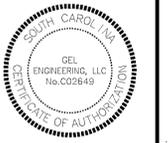
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**PRE-DREDGE HYDROGRAPHIC SURVEY
 BAYNARD CREEK &
 BAYNARD CREEK COMMUNITY DOCK**
 LOCATED ON HILTON HEAD ISLAND
 BEAUFORT COUNTY, SOUTH CAROLINA



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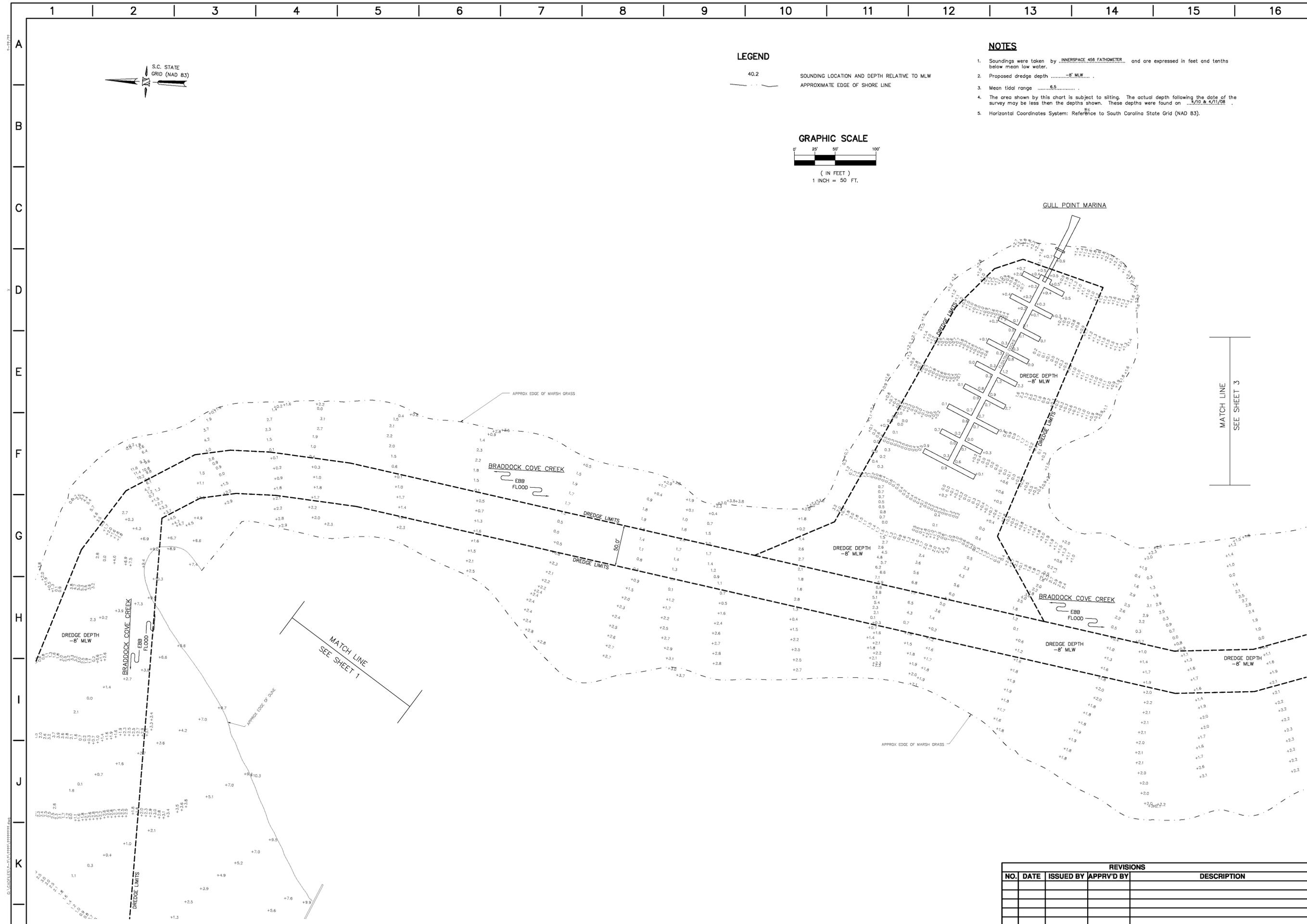
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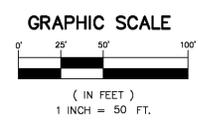
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- NOTES**
1. Soundings were taken by JINNERSPACE 458 FATHOMETER, and are expressed in feet and tenths below mean low water.
 2. Proposed dredge depth -8' MLW.....
 3. Mean tidal range 6.5.....
 4. The area shown by this chart is subject to silting. The actual depth following the date of the survey may be less than the depths shown. These depths were found on 4/10 & 4/11/08.
 5. Horizontal Coordinates System: Reference to South Carolina State Grid (NAD 83).

LEGEND

40.2
SOUNDING LOCATION AND DEPTH RELATIVE TO MLW
APPROXIMATE EDGE OF SHORE LINE



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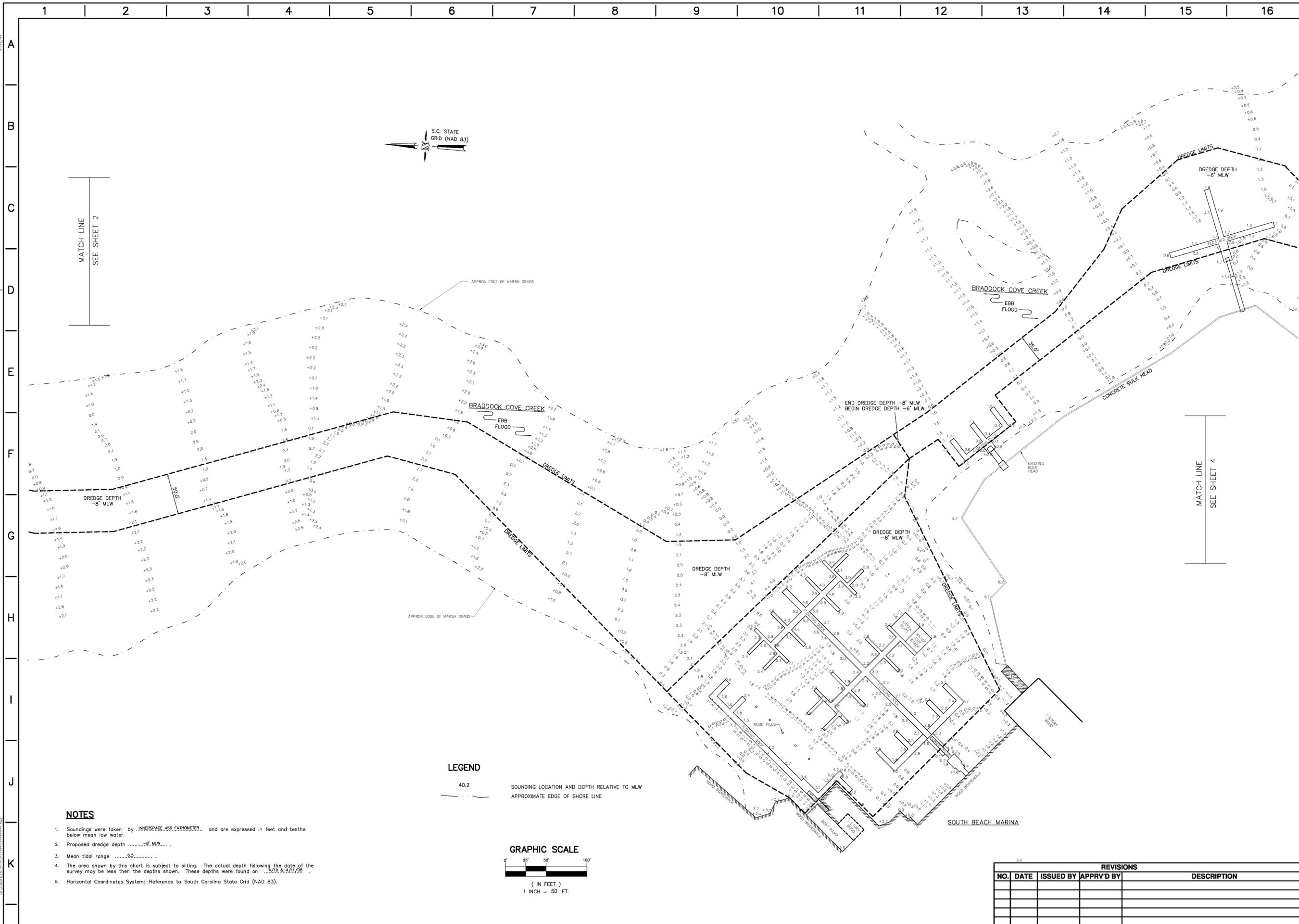
**PRE-DREDGE HYDROGRAPHIC SURVEY
BRADDOCK COVE CREEK,
SOUTH BEACH MARINA &
GULL POINT MARINA**
LOCATED ON HILTON HEAD ISLAND
BEAUFORT COUNTY, SOUTH CAROLINA



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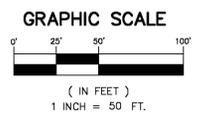


- NOTES**
1. Soundings were taken by INNERSPACE 456 FATHOMETER and are expressed in feet and tenths below mean low water.
 2. Proposed dredge depth-8' MLW.....
 3. Mean tidal range6.5.....
 4. The area shown by this chart is subject to siltation. The actual depth following the date of the survey may be less than the depths shown. These depths were found on3/10 & 6/11/08.....
 5. Horizontal Coordinates System: Reference to South Carolina State Grid (NAD 83).

LEGEND

40.2 SOUNDING LOCATION AND DEPTH RELATIVE TO MLW

----- APPROXIMATE EDGE OF SHORE LINE



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**PRE-DREDGE HYDROGRAPHIC SURVEY
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 BEAUFORT COUNTY, SOUTH CAROLINA



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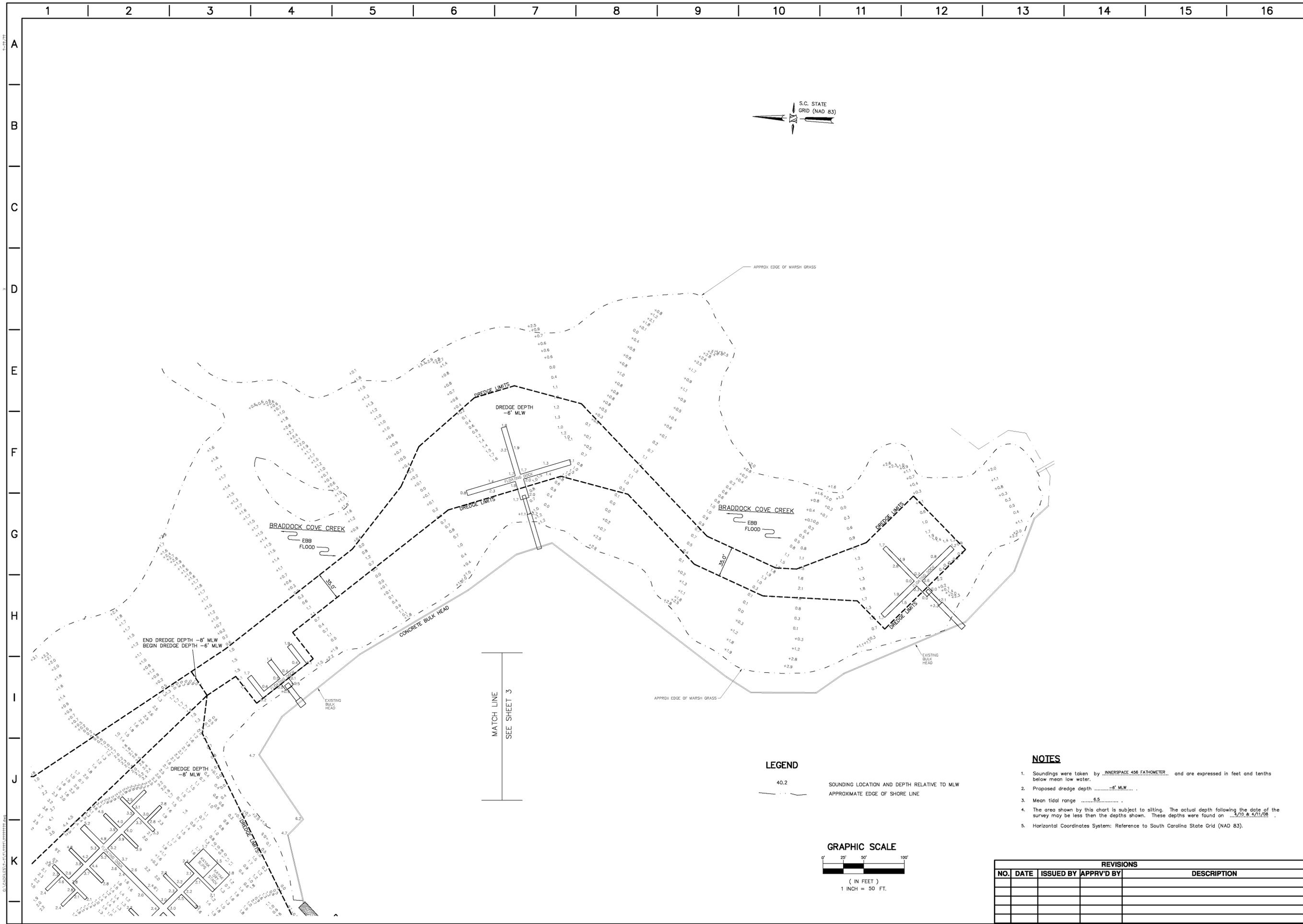
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**PRE-DREDGE HYDROGRAPHIC SURVEY
 BRADDOCK COVE CREEK,
 SOUTH BEACH MARINA &
 GULL POINT MARINA**
 LOCATED ON HILTON HEAD ISLAND
 BEAUFORT COUNTY, SOUTH CAROLINA



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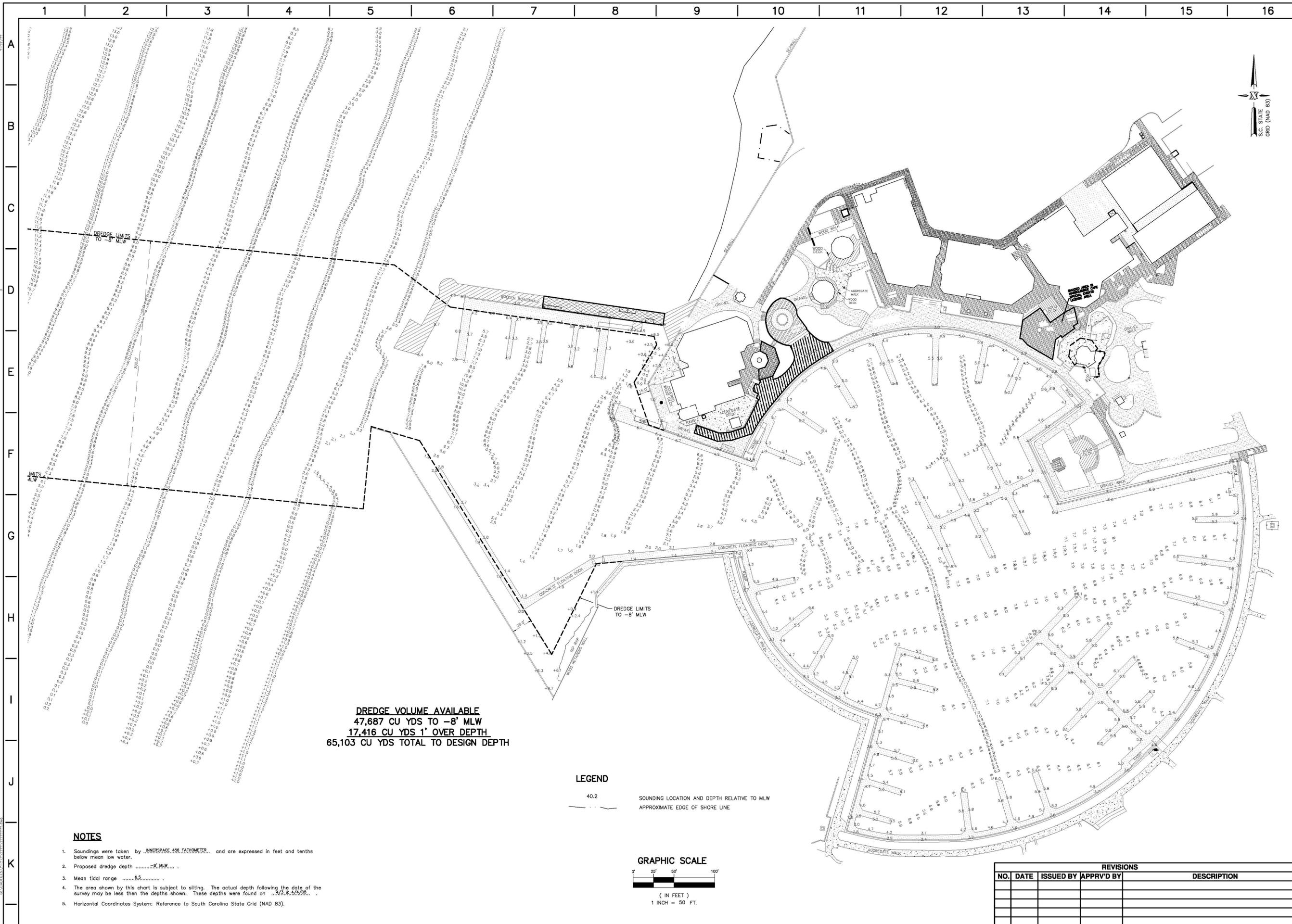
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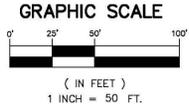
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2. Proposed dredge depth 6' MLW
3. Mean tidal range 6.5
4. The area shown by this chart is subject to siltation. The actual depth following the date of the survey may be less than the depths shown. These depths were found on 4/11/08.
5. Horizontal Coordinates System: Reference to South Carolina State Grid (NAD 83).

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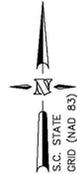


DREDGE VOLUME AVAILABLE
 47,687 CU YDS TO -8' MLW
 17,416 CU YDS 1' OVER DEPTH
 65,103 CU YDS TOTAL TO DESIGN DEPTH

LEGEND
 40.2 SOUNDING LOCATION AND DEPTH RELATIVE TO MLW
 APPROXIMATE EDGE OF SHORE LINE



- NOTES**
1. Soundings were taken by INNERSPACE 456 FATHOMETER and are expressed in feet and tenths below mean low water.
 2. Proposed dredge depth -8' MLW.
 3. Mean tidal range 6.5.
 4. The area shown by this chart is subject to siltting. The actual depth following the date of the survey may be less than the depths shown. These depths were found on 3/3 & 4/08.
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PRE-DREDGE HYDROGRAPHIC SURVEY
HARBOUR TOWN YACHT BASIN
 LOCATED ON HILTON HEAD ISLAND
 BEAUFORT COUNTY, SOUTH CAROLINA



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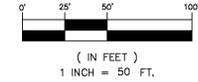
NOTES

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2. Proposed dredge depth-8' MLW.....
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LEGEND

40.2 SOUNDING LOCATION AND DEPTH RELATIVE TO MLW
 --- APPROXIMATE EDGE OF SHORE LINE

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PRE-DREDGE HYDROGRAPHIC SURVEY
HARBOUR TOWN YACHT BASIN
 LOCATED ON HILTON HEAD ISLAND
 BEAUFORT COUNTY, SOUTH CAROLINA



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APPENDIX III

Calibogue Cay Confined Disposal Facility, Capacity Analysis, GEL



Engineering LLC

Environmental | Engineering | Surveying

CALIBOGUE CAY CONFINED DISPOSAL FACILITY (CDF) CAPACITY ANALYSIS

CALIBOGUE CAY, SEA PINES PLANTATION
HILTON HEAD ISLAND, SOUTH CAROLINA

Submitted to: Community Services Associates, Inc.
Sea Pines Plantation
175 Greenwood Drive
Hilton Head Island, South Carolina 29928

Submittal Date: June 27, 2011

**CALIBOGUE CAY CONFINED DISPOSAL FACILITY (CDF)
CAPACITY ANALYSIS**

**CALIBOGUE CAY, SEA PINES PLANTATION
HILTON HEAD ISLAND, SOUTH CAROLINA**

Submitted to:

Community Services Associates, Inc.
175 Greenwood Drive
Hilton Head Island, SC 29928

Submitted by:

GEL Engineering, LLC
Post Office Box 30712/2040 Savage Road
Charleston, South Carolina 29417

Submittal Date: June 27, 2011

**CALIBOGUE CAY CONFINED DISPOSAL FACILITY (CDF)
CAPACITY ANALYSIS
HILTON HEAD ISLAND, SOUTH CAROLINA**

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- 2 Calibogue Cay CDF Capital Construction Estimate
- 3 Calibogue Cay CDF Maintenance Costs Estimate

Drawings

- F1 Calibogue Cay CDF Existing and Proposed
- F2 Proposed Cross Sections Calibogue Cay CDF

Appendices

- 1 Capital Cost Estimates Documentation and Assumptions
- 2 Preliminary Construction Schedule

Signature Page

This document, entitled "Calibogue Cay Confined Disposal Facility, Capacity Analysis," has been prepared for the Calibogue Cay Confined Disposal Area located on Hilton Head Island, South Carolina, by Mr. Thomas Hutto, P.G. and Mr. Joe Ervin, P.E. at the request of and for the exclusive use of Community Services Associates, Inc. It has been prepared in accordance with accepted quality control practices. It has been reviewed by the undersigned.

GEL ENGINEERING, LLC
a Member of The GEL Group, Inc.



Thomas D.W. Hutto, P.G.
SC License No. 912
Principal



Joe Ervin, P.E.
SC License No. 15241
Senior Engineer

6/27/2011

Date

**CALIBOGUE CAY CONFINED DISPOSAL FACILITY (CDF)
CAPACITY ANALYSIS
HILTON HEAD ISLAND, SOUTH CAROLINA**

Executive Summary

Evaluation of the Calibogue Cay Confined Disposal Facility (CDF) has determined that it could have adequate capacity to contain sediments from both Calibogue Creek and Harbour Town Marina. To obtain this capacity would require raising the dikes in their present location by approximately 6 feet. This increase in height would use all the existing dried sediment in the disposal area and not require import of any additional sediment.

Other scenarios were evaluated to determine if additional capacity could be obtained by expanding the footprint of the facility and/or raising the dikes higher. These other alternatives did not generate sufficient additional capacity to reliably handle sediment from additional venues other than Harbour Town. Furthermore, expanding the facility would impact freshwater wetlands, which could require significant permitting time.

A one-time capital cost of \$609,000 (budget estimate) would be required to raise the dikes approximately 6 feet and prepare the CDF for the increased capacity. This cost could be reduced through use of manpower/equipment from the Community Services Associates or local governments. With the dikes raised and the CDF empty, there would be adequate capacity for an almost complete dredge of Harbour Town Marina to design depths. After dewatering, there will be adequate capacity to dredge Calibogue Creek once and probably twice without removal of dried sediment. However, the CDF would need to be emptied thereafter to accommodate any significant future use. A cycle of alternating uses between venues could extend indefinitely with the basin being emptied after each dredge or after a full dredge of both venues. Alternatively, the CDF could continue to be used exclusively by Calibogue Cay after a one-time use by Harbour Town. Under existing covenants and restrictions, the Calibogue Cay property owners association has complete discretion on whether to allow use of the CDF by any other entity, including Harbour Town, and has expressed potential interest in allowing only a one-time use. A life cycle budget cost per cubic yard (CY) for dredging, drying, and emptying the CDF is \$29.00-\$33.00 CY. The actual cost will vary based on several variables, primarily fuel costs for dredging and trucking, dried sediment disposal location (trucking distance), and dried sediment disposal cost.

Dredging Harbour Town could likely be performed this year if activities are implemented in the near future. Long lead time items are raising the dikes and modifying the existing permits for disposal of sediment at this location.

1.0 INTRODUCTION

The creeks and marinas in Sea Pines Plantation are in need of dredging. Sediments have accumulated for a number of years and seriously hinder accessibility to the creeks and marinas during much of the tidal cycle. Dredging operations have not been performed on a regular basis because of the lack of affordable storage and disposal areas for the dredge spoils.

The areas currently in need of dredging include:

- Braddock Cove Creek, including the channels, Gull Point Marina, South Beach Marina and Port Villas
- Baynard Cove Creek including the channels and the Community Dock
- Harbour Town Marina

Calibogue Creek has recently been dredged, but will continue to require maintenance dredging at approximately 5 year intervals.

Locations suitable for placement of dredge spoils are limited. The only existing confined disposal facility (CDF) in the area of Sea Pines Plantation is the Calibogue Cay facility located off Calibogue Cay Road just north of Palmetto Drive (Drawing F 1). The purpose of this evaluation was to evaluate the feasibility of the Calibogue Cay CDF to accommodate dredged materials from other venues in Sea Pines Plantation and provide associated budget costs. Please note however that regardless of the technical findings, our understanding is that existing covenants and restrictions provide that the Calibogue Cay CDF can be used only for Calibogue Cay and use by other venues is at the discretion of the Calibogue Cay property owners association. Calibogue Cay owners have expressed potential interest in allowing a one-time use by Harbour Town. Under this scenario, a viable long-term alternative would still need to be developed for Harbour Town (and the other venues noted above), such as open water disposal conducted in accordance with Corps of Engineers and EPA protocols.

The Calibogue Cay spoils disposal area is approximately 9 acres and is located in an area largely surrounded by marsh alongside Calibogue Cay Road. There are limited areas of unused uplands between the CDF and Calibogue Road. This area provides a buffer between the road and the CDF. It also includes some areas of freshwater wetlands. The CDF has been the primary disposal area for spoils dredged from Calibogue Creek. The last dredging in the Creek (2009-10) generated approximately 30,000 cubic yards (CY) of spoils material.

GEL Engineering, LLC (GEL) performed hydrographic surveys of each of the creeks and marinas in Sea Pines Plantation during April and May of 2008. Those surveys indicated that dredging of all the areas would generate approximately 324,000 cubic yards (CY) of in-situ material. This amount of material was based on a desired specific final bottom elevation for each of the areas as reflected in the dredging permits issued by the state and federal agencies. Based on surveys of the CDF provided by Sea Island Land Surveying (SILS), there is insufficient capacity in the Calibogue Cay CDF to reliably accommodate all dredging needs even with an expanded facility and aggressive management of the sediments. However, there is adequate capacity to accommodate some dredged volumes in addition to Calibogue Creek.

2.0 SITE INVESTIGATION

GEL performed a site visit to the Calibogue Cay CDF to review existing conditions and propose options for continued use of the CDF. At the time of the visit, the CDF was essentially full and the previously deposited material was cracked and dry. The survey provided by SILS indicated berm heights between 11.0 MSL and 13.5 MSL. It showed that the dried material was no more than 3ft-4ft below the top of bank in all locations. There are two main discharge structures in the CDF, one at the northeastern corner and one at the northwestern corner. These are the structures from which water decanted from the pumped sediment is discharged. The inlet elevation (lowest point) of one is shown to be approximately 8.0 above mean sea level (MSL) with the other being lower. Our site visit verified the general elevations indicated on the survey. The latest survey available was dated Sept. 23, 2009.

While the survey provided by SILS was limited to the area from top of bank inward of the facility, the site visit indicated that the outside toe of the dikes is approximately 4ft – 9 ft above adjacent grades in the marsh. The outside face of the dike is placed on what appears to be a 2H:1V slope. It also appears that active landscaping has been performed on the dikes in the past to shield them from nearby properties. There appears to be an irrigation system along the top of the dike. It was unclear at the time of the site visit if this irrigation system was functional.

As a means to provide a preliminary assessment of the groundwater location, an augur was used on the outside toe of slope. Several holes were dug along the perimeter

from 18-24 inches deep. Each hole was essentially dry indicating that the groundwater table may be sufficiently below the bottom of the CDF to allow for expansion downward to provide greater capacity. Inside the CDF, there was no standing water.

The top of the dikes is approximately 8ft -10ft wide and in some places has become overgrown making it difficult to gain access to all areas. It appears that the landscaping work described previously has increased the amount of vegetation on the dikes.

3.0 CAPACITY ESTIMATES FOR THE CALIBOGUE CAY CDF

Using the survey data provided by SILS, GEL performed an analysis of the existing and proposed capacity of the CDF. It should be noted that there are multiple options available for expansion of the facility. A preliminary screening was performed of many options. Noteworthy findings that guided the balance of the evaluation included the following:

- Enlarging the CDF to maximize its footprint within the area defined by the saltwater marshes and a 100-foot setback from Calibogue Road would provide only approximately 11,000 CY of additional storage capacity based on the existing height of the berms. This rather small volume increase is primarily a result of the configuration of an expanded CDF in that the expanded area would be comparatively narrow. Narrow areas tend to provide small volumes because the dike walls take a comparatively large percentage of the diked areas. Furthermore, expanding the CDF laterally would encroach into freshwater wetlands, which would require a permit to fill. Finally, an expansion would make the CDF more visible.
- The volume of the CDF would not be nearly large enough to potentially accommodate dredge spoil from all Sea Pines venues.

Since the CDF could not accommodate all of SIDA, some assumptions were made to focus on potentially realistic scenarios. These assumptions include the following:

1. This CDF would be used for dredge spoils generated in Calibogue Creek and at Harbour Town Marina only. Harbour Town is much closer to the CDF than Braddock and Baynard and thus better situated to use the CDF.
2. The existing CDF footprint would not be expanded to provide additional storage

area since it would provide comparatively little additional volume. This was also assumed in order to mitigate possible visual impacts to the surrounding community and eliminate the need to permit fill of existing wetlands.

3. Expansion would be inward from the existing outside toe of slope, again to mitigate possible adverse visual affects to the community and to prevent potential intrusion into jurisdictional wetland areas adjacent to the site.
4. When excavating material to create additional vertical storage, excavation would stop at Elevation 4.0 MSL. Anything deeper may encounter excessive groundwater or prevent gravity discharge of effluent, although additional field borings and surveying would be required to confirm this assumption. If deeper excavation could be achieved, the CDF could accommodate a volume greater than that calculated below.
5. Slopes of the expanded dikes are maintained at 3H:1V. This was assumed based on the uncertainty of the stability of the existing material for dike construction. If a 2H:1V slope could be maintained, the CDF could accommodate marginally more material than calculated below.
6. All options assume a 2 foot freeboard.

Table 1 below describes five alternatives for expansion of the Calibogue Cay CDF based on the assumptions described above. Alternative 1 (no change in dikes or removal of dried sediment) is not considered a viable alternative although according to the existing survey data, there is some minor capacity available. Alternative 2 assumes that the dikes are not increased in height. Removed material must be disposed off-site in an approved manner. Alternatives 3 and 4 use existing material to increase dike heights although only Alternative 4 “balances” the earthwork on site avoiding truck traffic and the expense of either removing and disposing of excess material or importing material. Alternative 5 increases capacity above that of Alternative 4 and requires the import of fill material.

Table 1
Calibogue Cay CDF Capacity

ALTERNATIVE	DESCRIPTION	CAPACITY (CY)	BOTTOM ELEV (MSL)
1	EXISTING – NO CHANGE	21,280	8.0+/-
2	DIKE HEIGHT 8 FT (EXISTING HEIGHT)	71,050	4.0
3	DIKE HEIGHT 12 FT	111,010	4.0
4	DIKE HEIGHT 14 FT	123,510	4.0
5	DIKE HEIGHT 16 FT	134,060	4.0

Drawings for the proposed expansion were not provided for all alternatives. Drawing F1, however, shows the proposed plan view of an expanded CDF with dike heights increased to 14 ft. Drawing F2 includes cross sections for this alternative.

Please note that the assumption that the existing dredge spoil can be used for raising the dikes would need to be confirmed by geotechnical testing. For reference, testing of the Harbour Town sediments in 2008 showed that they were primarily silts and clays with a smaller sand fraction. It is anticipated that the material in Calibogue Cay will be similar. Dried in-situ dredge spoil of similar nature is routinely used to increase dike heights without detrimental effects.

4.0 CONSTRUCTION COST ESTIMATES FOR EXPANDING CALIBOGUE CAY CDF

To help quantify the alternatives described for expanding the capacity of the Calibogue Cay CDF, construction budgets have been prepared for each alternative. Table 2 describes expected costs for each. Appendix 1 includes backup documentation and assumptions made in preparing the construction estimates. All alternatives (except Alternative 1) will require some landscaping to replace lost vegetative cover. In addition,

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fc: cmmn00111

since these alternatives call for the excavation of the bottom of the CDF to Elev 4.0 MSL, new outlet structures will need to be constructed at lower elevations to take advantage of the added vertical capacity. Excavation to depths greater than elevation +4 MSL to obtain greater capacity may be possible and can be determined by additional surveying and subsurface investigations. Elevation 4.0 MSL was chosen as an elevation we are confident can be reached given the lack of actual survey data and subsurface investigations.

These estimates have been created using 2011 dollars and will be subject to change depending on the actual time frame for completion and market variables such as fuel costs.

Table 2
Calibogue Cay CDF Capital Construction Estimate

ALTERNATIVE	DIKE HEIGHT/ CAPACITY* (CY)	CONSTRUCTION ESTIMATE (2011 \$ 000)
1	NO CHANGE (21,280)	0
2	8 FT (71,050)	1,190
3	12 FT (111,010)	1,123
4	14 FT (123,510)	609
5	16 FT (134,060)	924

* Can dredge approximately 50% of capacity during any given event due to the addition of water in hydraulic dredging process.

Note that Alternative 4 represents the lowest capital cost option. This is primarily because this option does not require the export or import of material. Each of the other alternatives (except Alt 1) will require export or import of material to the site.

In each of these alternatives, permitting and design fees have been included as has a contingency item. Permitting and design fees are not expected to be substantial for

Alternative 2, but will be required for increasing the dike height and/or installing new effluent discharge structures for options 3, 4 and 5.

5.0 CAPACITY ANALYSIS FOR CALIBOGUE CAY CDF

As stated in the introduction, analysis of the capacity of the Calibogue Cay CDF assumes that only Harbour Town Marina and Calibogue Creek will use the facility for dredge spoils disposal. In this scenario, the in-situ quantity established in the hydrographic survey of Harbour Town Marina in 2008 is used as the baseline for establishing usefulness of the facility. The hydrographic survey identifies 65,100 CY of material to be dredged, including both the channel and inner basin. To this volume a quantity of 30,000 CY in-situ has been included for Calibogue Creek as a future dredging requirement. This is an accurate estimate according to Calibogue Cay representatives who have managed previous dredge events.

Additional shoaling has likely increased the actual volume has since the 2008 survey of 65,100 CY. Therefore, an updated hydrographic survey would need to be performed if the project moves forward, and the dredge design for Harbour Town may need to be adjusted based on the findings.

In establishing the time frame and dredging costs expected using the CDF, it is assumed that the in-situ material is mixed at a ratio of approximately 20% sediment to 80% water. This quantity is pumped to the disposal area where a significant amount of the water is quickly decanted. Through active control of the effluent structures, competent dredgers can remove a significant amount of this excess water while dredging is ongoing. After dredging operations are complete, the ratio is reduced to approximately 50% sediment and 50% water. This remaining water is removed over time through slow discharge of effluent, evaporation and infiltration. These processes can be expedited through the active management of the facility, ditching and “working” the basin to remove the water as quickly as possible.

This 50:50 ratio, while not an absolute, is nevertheless a good estimate for establishing the overall capacity of the disposal basin. This ratio helps the dredge operator to keep dredging operations as efficient as possible. Since the water in the spoils is initially the same volume as the sediment, the sediment capacity is effectively one-half of the basin capacity. For example, to dredge 100,000 CY of in-situ sediment in

a single event will require 200,000 CY capacity in the basin.

For long-term capacity analysis, GEL obtained data from the Drum Island CDF in Charleston, SC. The material dredged from the Charleston Harbor and placed on Drum Island is similar to the fine grained sediments present in Harbour Town and Calibogue Creek. The data from Drum Island indicates that settlement of the spoils material over a 2-year period will result in approximately 54% of the initial volume placed in the CDF. That is, after 2 years of dewatering, the amount of material left in the CDF will approximate the in-situ volume originally dredged. The dewatering process can be shortened and the moisture content of the sediment reduced to below pre-dredge levels by the periodic use of mechanical equipment to ditch the CDF and create pathways for the water to the move to the discharge structures. These activities can reduce the volume to somewhat less than the original in-site amount.

6.0 CONCLUSIONS

As shown in Table 2, the most cost effective alternative for increasing the capacity of the Calibogue Cay CDF is the excavation of the site to Elevation 4.0 MSL and the use of the existing material to increase the dike height to Elevation 18.0 MSL +/- (14ft Dike Height). This alternative results in a capacity of 123,500 CY +/- . Assuming the quantity to be dredged from Harbour Town Marina is 65,100 CY, the CDF would likely have adequate capacity for almost a complete dredge, but there would be no additional capacity available for subsequent dredging pending drying.

After drying and dewatering there would likely be adequate capacity for one and possibly two dredge events by Calibogue Cay. This assumes that the 123,500 CY +/- contracts to 60,000 CY +/- after 2 years. This would provide 60,000 CY +/- capacity in the CDF, which would be adequate for a complete dredge event for Calibogue Creek. Thereafter, increasingly small capacities would be available in the CDF after each dredging and drying cycle, but there would potentially be enough capacity for an additional dredge of Calibogue Creek.

After dredging Harbour Town once and Calibogue Creek twice, the dried material would need to be removed prior to additional dredging. This would effectively return the CDF to its original capacity. Table 3 summarizes costs anticipated for maintenance of the facility during long-term dewatering and removal costs for the dried material.

Initially, the capital costs described in Appendix 1 for Alternative 4 would need to be incurred prior to beginning dredging at Harbour Town.

After the dikes have been raised, the Calibogue Cay CDF has the necessary capacity for long-term maintenance dredging of Calibogue Creek and Harbour Town Marina, assuming the dried material is periodically removed.

Table 3
Calibogue Cay CDF Maintenance Costs Estimate

YEAR	CAPITAL COSTS \$ 000	DREDGE COSTS \$ 000	O&M COSTS \$ 000	REMOVAL COSTS ¹ \$ 000
0	609	944		
1			24	
2		435	24	7282
3			24	
4			24	335

¹ – Note that removal costs could be combined to a single event after both venues have had a complete cycle of dredging.

² – Spoil removal will take place in Year 2 prior to dredging that would occur later that year.

Included in these costs is an estimate of yearly costs to actively manage the dewatering process. This cost is based on a specified number of days per year at a given daily rate. See Appendix 1. Note that after Year 4, both venues have been dredged and the basin is empty.

Dredging costs are based on historic values normally seen for quantities of this magnitude. Since the maximum capacity of the CDF does not allow dredging of both Harbour Town Marina and Calibogue Creek at the same time, there are significant mobilization costs for each dredging event. In addition, we have assumed that the spoils material placed in the CDF after the initial dredging of one basin will need to be dried, removed and disposed of prior to dredging the second basin. If Harbour Town is dredged only a single time, the basin would not need to be emptied after Year 4 and could

potentially accommodate another dredge of Calibogue Creek.

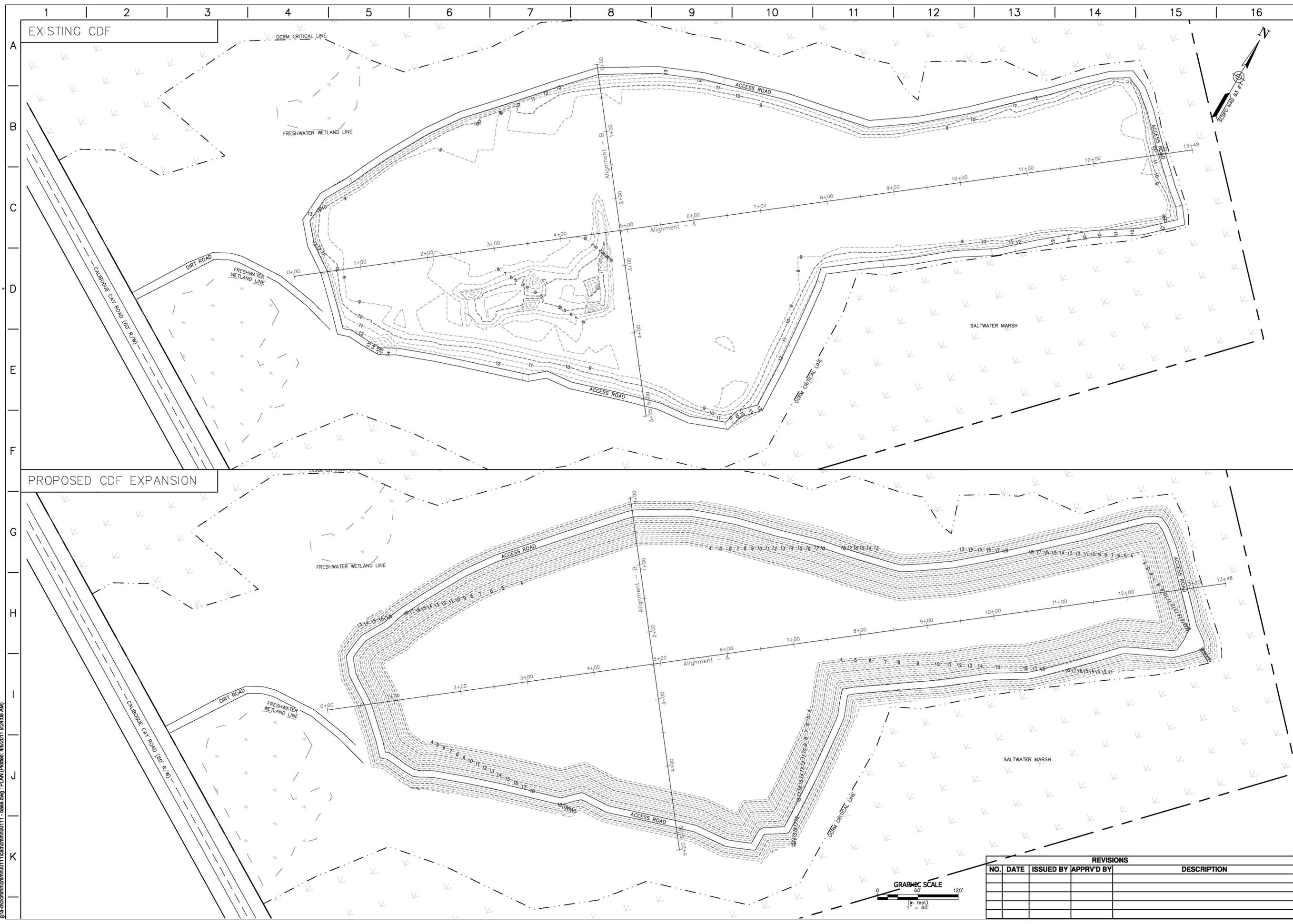
Since the intent here is to dredge as soon as possible, the costs shown above include yearly maintenance to assist in the removal of water. The yearly outlays described above anticipate an aggressive schedule but can be accrued over a longer period of time if a less aggressive schedule is warranted after Harbour Town is dredged.

Also included are the costs to remove the dried material from the CDF and dispose of it off-site. The removal cost used here assumes a 50 mile round trip for trucks disposing of the material. It assumes a nominal cost for disposal on private property and does not anticipate disposal at an approved landfill where disposal costs can be much higher. Therefore these costs described could vary depending on the location of the ultimate disposal site. Costs could also be significantly reduced if the material can be re-used for things like non-structural fill or as dike material for construction of alternate disposal sites. The breakdown of the costs shown here conservatively does not anticipate alternate uses and are included in the Appendix.

The dredge costs shown above anticipate one cycle of dredging at Harbour Town Marina and at Calibogue Creek. At the end of Year 4, the CDF would be empty again and ready to repeat the dredging cycle. Of course, the removal costs in Year 4 could be delayed depending on the accretion rates in Harbour Town Marina and the need to complete the next cycle of dredging. Based on these parameters, we anticipate the total costs of expanding the Calibogue Cay CDF and completing the dredging of Harbour Town Marina and Calibogue Creek between \$29.00/CY and \$33.00/CY in 2011 dollars.

As mentioned above, we do not anticipate any major permitting requirements associated with expansion of the Calibogue Cay CDF. However, to place material in it from Harbour Town would require modification of the state and federal dredging permits. GEL has prepared a preliminary schedule for completion of the expansion recommended above (Appendix 2).

Drawings



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problem solved

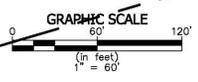
**CALIBOGUE CAY CDF CAPACITY ANALYSIS
 EXISTING AND PROPOSED CDF PLAN VIEW**

COMMUNITY SERVICES ASSOCIATES, INC.
 SEA FINES PLANTATION
 HILTON HEAD, SOUTH CAROLINA

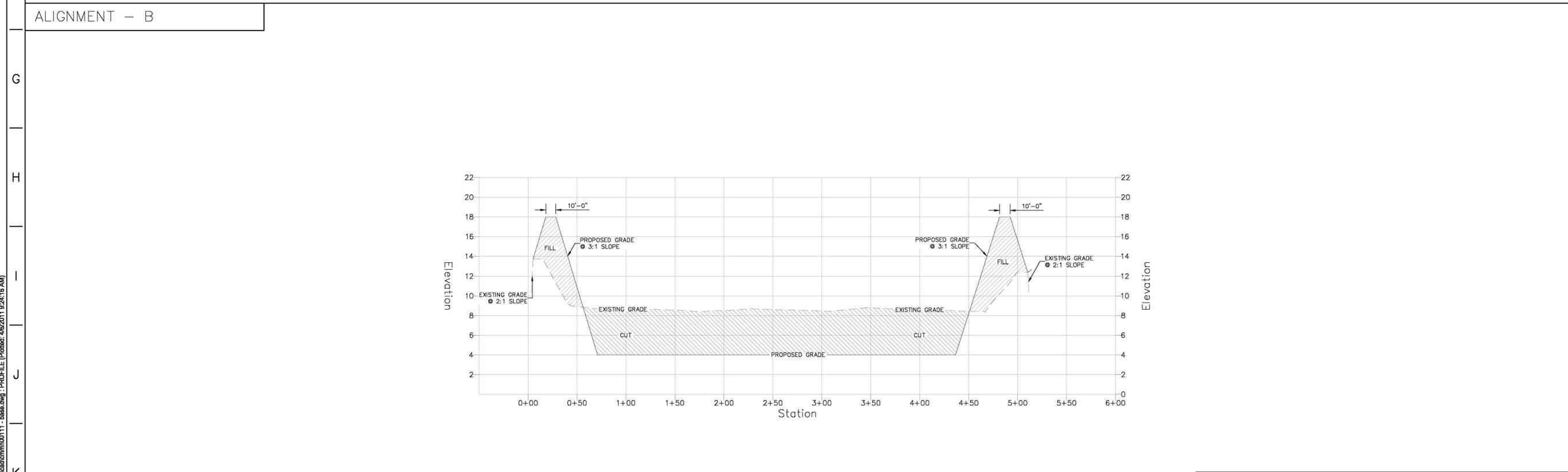
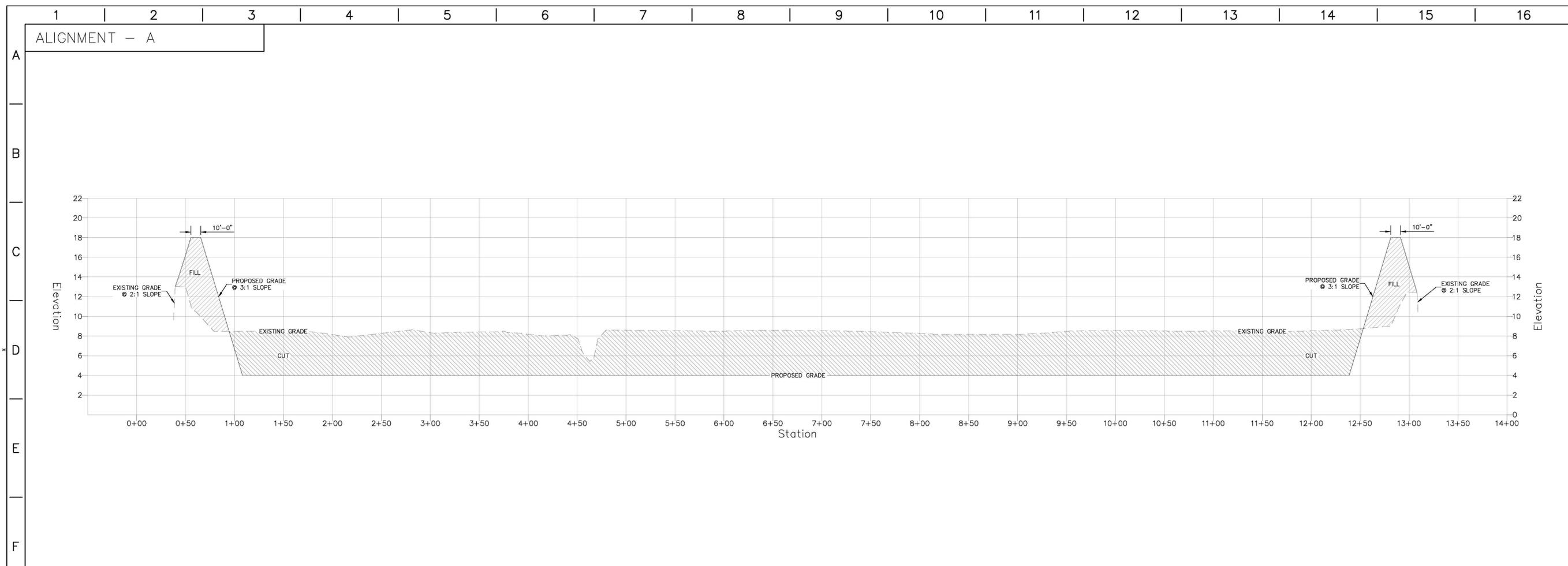


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SCALE	1"=60'
PROJECT NUMBER	CMMN00111
SHEET NUMBER	F1

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**CALIBOGUE CAY CDF CAPACITY ANALYSIS
 PROPOSED CDF EXPANSION CROSS SECTIONS**
 COMMUNITY SERVICES ASSOCIATES, INC.
 SEA FINES PLANTATION
 HILTON HEAD, SOUTH CAROLINA



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Appendix I

Capital Cost Estimates Documentation and Assumptions

8 FT HEIGHT

ITEM	UNIT	UNIT PRICE	QUANTITY	COST	SOURCE	COMMENTS
Clearing and Grubbing	Ac	\$4,500.00	3	\$11,700	Based on Recent Local Projects	
Excavation	CY	\$3.50	43,500	\$152,250	Means Construction Data+Blue Max	
Removal and Disposal	CY	\$17.20	43,500	\$748,200	Trucking	
New Outlet Structure	EA	\$6,000.00	2	\$12,000		Based on Previous Pond Designs
Landscaping	SF	\$0.75	114,000	\$85,500		2.6 acres
Erosion and Sediment Control	LS	\$25,000.00	1	\$25,000		
SUBTOTAL				\$1,034,650		
Contingency 10%				\$103,465		
Design and Permitting 5%				\$51,733		
TOTAL				\$1,189,848		

1. Does Not Include Costs of Tree Mitigation
2. Does not Include Land Acquisition Costs
3. No Wetlands Taken During Construction

12 FT HEIGHT

ITEM	UNIT	UNIT PRICE	QUANTITY	COST	SOURCE	COMMENTS
Clearing and Grubbing	Ac	\$4,500.00	3	\$11,700	Based on Recent Local Projects	
Placement and Compaction	CY	\$7.50	43,350	\$325,125	Means Construction Data+Blue Max	
Removal and Disposal	CY	\$17.20	27,700	\$476,440	Trucking	
New Outlet Structure	EA	\$6,000.00	2	\$12,000		Based on Previous Pond Designs
Landscaping	SF	\$0.75	114,000	\$85,500		2.6 acres
Erosion and Sediment Control	LS	\$25,000.00	1	\$25,000		
SUBTOTAL				\$935,765		
Contingency 10%				\$93,577		
Design and Permitting 10%				\$93,577		
TOTAL				\$1,122,918		

1. Does Not Include Costs of Tree Mitigation
2. Does not Include Land Acquisition Costs
3. No Wetlands Taken During Construction

14 FT HEIGHT

ITEM	UNIT	UNIT PRICE	QUANTITY	COST	SOURCE	COMMENTS
Clearing and Grubbing	Ac	\$4,500.00	3	\$11,700	Based on Recent Local Projects	
Placement and Compaction	CY	\$7.50	49,750	\$373,125	Means Construction Data+Blue Max	
Removal and Disposal	CY	\$13.60	0	\$0	Trucking	
New Outlet Structure	EA	\$6,000.00	2	\$12,000		Based on Previous Pond Designs
Landscaping	SF	\$0.75	114,000	\$85,500		2.6 acres
Erosion and Sediment Control	LS	\$25,000.00	1	\$25,000		
SUBTOTAL				\$507,325		
Contingency 10%				\$50,733		
Design and Permitting 10%				\$50,733		
TOTAL				\$608,790		

1. Does Not Include Costs of Tree Mitigation
2. Does not Include Land Acquisition Costs
3. No Wetlands Taken During Construction

16 FT HEIGHT

ITEM	UNIT	UNIT PRICE	QUANTITY	COST	SOURCE	COMMENTS
Clearing and Grubbing	Ac	\$4,500.00	3	\$11,700	Based on Recent Local Projects	
Placement and Compaction	CY	\$7.50	49,750	\$373,125	Means Construction Data+Blue Max	
Removal and Disposal	CY	\$13.60	0	\$0	Trucking	
Import Fill	CY	\$21.50	12,200	\$262,300		
New Outlet Structure	EA	\$6,000.00	2	\$12,000		Based on Previous Pond Designs
Landscaping	SF	\$0.75	114,000	\$85,500		2.6 acres
Erosion and Sediment Control	LS	\$25,000.00	1	\$25,000		
SUBTOTAL				\$769,625		
Contingency 10%				\$76,963		
Design and Permitting 10%				\$76,963		
TOTAL				\$923,550		

1. Does Not Include Costs of Tree Mitigation
2. Does not Include Land Acquisition Costs
3. No Wetlands Taken During Construction

Appendix II

Preliminary Construction Schedule

EXHIBITS

Exhibits

A. Economic Impact

Tourism

The Sea Pines Waterways are an integral component in maintaining Hilton Head Island as a highly desirable community and resort destination. Tourism is by far the single largest financial contributor to our local and state economies. A 2008 study by the University of South Carolina-Beaufort and Clemson University provides an assessment of tourism's financial contribution to our area:

- tourism in 2008 generated between \$810-\$893 million in annual gross sales to the local economy
- between 64-70% of Hilton Head's 2008 gross sales were generated by visitors; \$6.40-\$7.00 out of every \$10 in local gross sales was a result of tourism
- 2008 tourism and hospitality employment accounts for 25% of Beaufort County's work force
- Hilton Head's gross sales were nearly \$1.3 billion in 2008 which is roughly 38% of the total for Beaufort County
- Hilton Head's accommodations tax collections for 2008 were nearly \$4.1 million which represented 87.6% of the total collected by Beaufort County.

The Hilton Head/Bluffton Chamber of Commerce reported that over 2.2 million people visited the Hilton Head area in 2009.

Unless our waterways are restored and preserved there is no question that tourism here will suffer greatly. The economic impact of not dredging would be severe. Just a 10-25% drop in tourist spending means a loss of \$81 million to over \$223 million in gross sales each year. The "trickle down" impact of losing tourism dollars in our local economy is deep and significant.

The Heritage Golf Tournament

The Heritage Golf Tournament is one of the largest tourist events in South Carolina. As stated in an editorial of The Island Packet on April 8, 2012:

For all the pomp on opening day and the party atmosphere throughout the week, Hilton Head Island's annual PGA Tour event is serious business for the Lowcountry and South Carolina.

Clemson University's International Institute for Tourism Research and Development and USC-Beaufort Department of Hospitality Management conducted an economic impact and marketing study of the 2010 Heritage Golf Tournament for the Heritage Classic Foundation. The study found that the tournament created \$81.9 million in economic activity in 2010. The study also estimated that the tournament generated:

- \$660 million since 2001
- over \$62 million in net government revenues for the state of South Carolina
- \$26 million in net local government revenues during the same period.

When the 2011-2015 impacts are added, the total economic impact of the tournament between 2001-15 is expected to reach \$1 billion, with net state government revenues growing to nearly \$100 million and net local government revenues growing to \$44 million.

The tournament has donated \$22 million to 60 local and regional charities since its founding in 1986. In 2011 the tournament gave \$1.25 million to various local charities. But, if our marina at Harbour Town is not restored there is a strong possibility we will lose this golf tournament and the worldwide television coverage of Hilton Head and the Lowcountry which the tournament provides.

Harbour Town and South Beach Village

In addition to the golf tournament, Harbour Town and South Beach Village attract thousands of tourists each year. The Harbour Town Yacht Basin and its fabled, candy striped lighthouse are beacons for our visitors. The Lighthouse is the brand of our community. It is the second most recognized landmark on the east coast. The draw of

the lighthouse is in jeopardy as the yacht basin has silted in to the point that many boats have been forced to find a home elsewhere. Additionally, Harbour Town is no longer an overnight destination along the Intracoastal Waterway for large yachts because it has lost the necessary depth.

South Beach Village is home to South Beach Marina, the various Salty Dog businesses and other tourist businesses including sport fishing and other water dependent businesses. South Beach Marina is incurring an even worse silting situation than Harbour Town. Boats are blocked by sand and silt from passage to the Calibogue Sound during the six hours of each of the two low tides. Thus, for twelve hours of each day navigation is not possible into or out of South Beach Marina and all of Braddock Creek.

Visitors to Sea Pines provide roughly \$2.2 million in gate revenues. These funds contribute to the overall maintenance of Sea Pines roadways and common areas and help keep owners' annual fees among the lowest in the area. These revenues make up a large portion of Sea Pines' contribution to Hilton Head's accommodations and hospitality taxes. About 30% of these taxes are generated from Sea Pines businesses and residents. Sea Pines businesses and residents also contribute about \$62.5 million annually net of services received to the state and county. But, tourists who have flocked to Harbour Town and South Beach and spent their money dining, shopping and enjoying all the water oriented activities will fade as the water ambiance deteriorates, gate fees and tax revenues will fall dramatically.

Sea Pines Resort

The impact upon lodging, golf, recreation, food and beverage and the employees to support these operations in Sea Pines will be dramatic if the waterways are not re-stored. Sea Pines Resort owns and operates the world famous Harbour Town Golf Links golf course and two others in Sea Pines along with a four-star rated hotel, swimming pools, restaurants and other amenities that make Sea Pines a high caliber destination resort. Sea Pines Resort has invested over \$30 million in its Sea Pines assets since acquiring them in 2005. The Resort is currently in an early phase of developing plans for further improvements of its amenities and assets that will benefit residents as well as visitors and guests. The standards for these improvements will be in the four- star/four diamond

level. Many of the Resort's current assets are roughly 50 years old and are in need of substantial upgrade in quality and scope. Conceptual plans include new golf clubhouses, a swimming pool complex, a new beach club, additional high- end hotel rooms and significant improvements in and around the Harbour Town Yacht Basin area. The Resort's anticipated investment will be in the area of \$75 million. But if the waterways are not restored Sea Pines Resort will be forced to re-evaluate its plans to invest in the infrastructure and modernization of its Sea Pines holdings. Should it decide to reduce or cancel its anticipated investments in its assets because of deteriorating condition of the waterways there would be a significant adverse effect on residents' lifestyles as well as their property values.

Drop In Property Values

If the Sea Pines waterways are not restored there will be a significant drop in residential and business property values. A group of respected and experienced realtors have been surveyed as to their opinion of this impact upon property values. The realtors have said that the decline in property values would fall somewhere in the 25-50% range. Those properties located on or near the waterways would suffer a greater loss of value than those farther away. Significant loss of property values in Sea Pines would adversely affect property values on the rest of Hilton Head and surrounding area. Obviously, if such losses occurred, tax revenues will decline significantly as well.



June 24, 2012

To whom it may concern,

As the Tournament Director of the RBC Heritage Presented by Boeing, one of South Carolina's largest sporting events, and one of the premier golf tournaments on the PGA TOUR, I am somewhat concerned.

We have become increasingly aware of the potential effect that an empty Harbour Town Marina would have on the Tournament. A number of our players, many of our sponsors and a large number of our ticket holders use their boats and the Marina during the tournament each year. While this would have an adverse impact on them, imagine the four days and sixteen live hours on CBS and the Golf Channel without the ability to frequently pan over the eighteenth green, across the water to the Lighthouse and then into the Harbour and all the boats there. I would suspect that this TV highlight occurs at least 20 times during the Tournament and reaches millions of viewers.

The Harbour Town Golf Links are a wonderful and beautiful sight in and of itself but think about the classic tournaments and each has a visual focal point that is used time and time again during the broadcast of the Tournament itself. Think about the windblown pines and rocks at Pebble Beach. We are fighting hard for this Tournament and what we don't need is a shallow dirty Harbour with few boats afloat. If players, sponsors and the general public were unable to access the Harbour, it would clearly impact the economy of the Island and the State.

We, at the Heritage Classic Foundation, feel it is important to move forward as quickly as possible with dredging of the Marina to preserve one of the big parts of this Tournament.

A handwritten signature in black ink, appearing to read 'Steve Wilmot'.

Steve Wilmot
CEO/Tournament Director



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Telephone
(757) 547-9391

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(757) 547-2833

June 17, 2010

General Engineering
2040 Savage Road
Charleston, SC 29407

Ph: (843) 769-7378
Fax: (843) 769-7397

Attn: Larry Setzler

RE: Dredging at Hilton Head Is
Pumping Slurry Into Scows

Larry:

This is to inform you as to why Norfolk Dredging Company considers that the combination of hydraulic dredging and bottom dump disposal is not suitable for the dredging project proposed at Hilton Head Island. Bottom Dump Scows are equipped with a mechanical seal that retains the slurry inside the barge by applying pressure to each half of the barge. The more dense the slurry, the lower the likelihood for leaking of the slurry; conversely the less dense the slurry, the higher the likelihood of leaking. Leaks such as this are viewed by the EPA and Corps as permit violations and would likely result in work stoppages and substantial fines.

Mechanical dredging typically results in high density slurries which compliments bottom dump disposal as an effective tool for this type of dredging. It is not unusually to achieve 85% insitu to 15% water mixture with a mechanical operation. A hydraulic dredge typically results in 15% insitu to 85% water mixture.

The combination of hydraulic dredging and bottom dump disposal is viable solution when the material to be dredged is coarse (sand) and dewatering using weirs or overflow is possible without causing turbidity problems; but when the material is silty, the settlement rates are too slow. In this case, the slurry remains turbid for an extended period preventing effective dewatering. If the slurry cannot be dewatered, transporting 15 % solids typically makes this solution cost prohibitive.

The content of silt combined with very low density produced by a hydraulic dredge do not make the combination of hydraulic dredging and bottom dump disposal a practical option. This is not to say that this approach is impossible, but not one we see as a prudent approach to this project.

Please contact us if we can be of further assistance.

Very truly yours,

NORFOLK DREDGING COMPANY

A handwritten signature in black ink, appearing to read "Michael B. Haverty". The signature is written in a cursive style with a large, sweeping initial "M".

Michael B. Haverty
Vice President

C.

**FINAL REPORT
OF THE
SEA PINES WATERWAYS TASK FORCE
August 19, 2011**

TASK FORCE ACTIVITIES AND FINDINGS

1. Since its creation in February 2010 the Sea Pines Waterways Task Force (the Task Force) has been analyzing all methods for dredging Harbour Town Marina, Braddock Creek, including South Beach Marina, private docks at Gull Point, Portside and Port Villas, and Baynard Creek (collectively referred to herein as the Sea Pines Waterways).
2. During this time the Task Force consulted independent engineers, government officials including regulators, dredging contractors and others. The Task Force also reviewed numerous publications and regulations concerning dredging operations and procedures.
3. The Task Force reviewed the various dredging methods including mechanical and hydraulic. The Task Force learned that hydraulic dredging is preferred by regulators and would be the least expensive and most effective method for the Sea Pines Waterways.
4. The Task Force reviewed methods for disposal of the dredge material including disposal at a land based disposal site, off shore at a federally approved dredge material disposal site, use of dewatering techniques using polymers or geotextile tubes, and open water disposal. The Task Force confirmed that open water disposal is specifically authorized in state dredging regulations and has been used by the Army Corps of Engineers in South Carolina waterways.
5. The process for obtaining a permit for open water disposal involves complying with a joint protocol of the Army Corps of Engineers (the Corps) and the U.S. Environmental Protection Agency (the EPA) and complying with a S.C. Department of Health Environmental Control protocol. Certain Task Force members have had meetings with these regulators and the Chief of the Regulatory Division of the Charleston District of the Corps has offered to coordinate a task force to pursue compliance with the various protocols
6. The Task Force considered the impact of these various dredge and disposal methods on the Sea Pines Community and surrounding environment. The Task Force concluded that hydraulic dredging with open water disposal would have the least adverse impacts on our community and the surrounding environment.
7. The Task Force carefully considered cost information on the various dredging and disposal methods. The Task Force learned that hydraulically dredging the Sea Pines Waterways with open water disposal would be by far the least expensive of all the methods considered.
8. The Task Force considered the adverse effects of not dredging the Sea Pines Waterways including the effects on the Heritage Golf Tournament, tourism in

general and more specifically at Harbour Town and the South Beach Village, gate fees and on the values of our homes throughout Sea Pines. The Task Force concluded that there would be significant adverse effects if dredging were not conducted as soon as possible.

9. The Task Force considered the opinions of our residents through the 2009 residents' survey, which revealed overwhelming support for maintaining the navigability of the Sea Pines Waterways, and through various open meetings in our community lead by Community Services Associates (CSA) and the Association of Sea Pines Plantation Property Owners (ASPPPO). The consensus from those meetings was enthusiastic support for dredging the Sea Pines Waterways hydraulically with open water disposal.

CONCLUSION

Having considered the environmental, economic, social, legal and technological suitability of hydraulic dredging with open water disposal for the Sea Pines Waterways, the Task Force concludes that they are the only feasible methods for dredging the Sea Pines Waterways and that there are no feasible alternatives. See attached excerpts from S. C. Code of Regulations.

RECOMMENDATIONS

A. To South Island Dredging Association (SIDA)

Pursue Permitting for Hydraulic Dredging with Open Water Disposal

- a. As soon as possible, develop and implement a plan, including necessary funds, to attain permits for hydraulic dredging and open water disposal. The permits should be pursued in accordance with procedures recommended by the consulting engineers.
- b. Together with Sea Pines leadership, lead a coordinated effort among government officials, regulators and environmental interest groups to gain their acceptance of open water disposal for Sea Pines dredging operations.

B. To CSA and ASPPPO Boards

1. Endorse Hydraulic Dredging and Open Water Disposal: We recommend, for the reasons stated herein, that the Boards of Directors of CSA and ASPPPO adopt a joint resolution endorsing the Task Force conclusion that hydraulic dredging with open water disposal are the only feasible methods for dredging the Sea Pines Waterways and that there are no feasible alternatives.

2. Encourage Community Support: Garner and advocate Sea Pines Community support for maintaining navigable Sea Pines Waterways.

SC Code of Regulations R30-12 I.

Deposition of Dredged Material:

(1) The deposition of dredged materials resulting from numerous dredging activities along the coast has serious environmental effects separate from the original dredging activity. Thousands of acres of productive wetland habitat have been destroyed by such deposition. Recognizing that additional disposal sites will be required, it is important that site acquisition proposals include plans for mitigating any adverse impacts upon the environment.

(2) The following standards are to be utilized:

(a) Upland disposal of dredged material shall always be sought in preference to disposal in wetlands. Vegetated wetlands and mudflats shall not be utilized for disposal of dredged materials unless there are no feasible alternatives. Any other wetlands should not be utilized for disposal of dredged materials when other alternatives exist;

(b) Open water and deep water disposal should be considered as an alternative if highland alternatives are not feasible. However, open and deep water disposal sites should be seriously considered only after careful consultation with the Department and other relevant State and Federal agencies;

.....
S. C. Code of Regulations 30-1 D.

(23) Feasible (feasibility) - As used within these rules and regulations (e.g., "unless no feasible alternative exists"), feasibility is determined by the Department with respect to individual project proposals. Feasibility in each case is based on the best available information, including, but not limited to, technical input from relevant agencies with expertise in the subject area, and consideration of factors of environmental, economic, social, legal and technological suitability of the proposed activity and its alternatives. Use of this word includes, but is not limited to, the concept of reasonableness and likelihood of success in achieving the project goal or purpose. "Feasible alternatives" applies both to locations or sites and to methods of design or construction, and includes a "no action" alternative.

SC Code of Regulations R30-12 I.

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Appendix

1. Calibogue Cay Confined Disposal Facility (CDF) Capacity Analysis
By GEL Engineering, LLC, 6/27/11
 2. Dredging Alternatives Evaluation and Feasibility of Upland Disposal/Forest Preserve
By GEL Engineering, LLC, 6/22/11
 - Braddock Cove Creek and Baynard Cove Creek
 3. Open Water Disposal of Dredged Sediments
Correspondence dated 6/30/10 from GEL Engineering, LLC
 - Summary of Findings from Agency Meetings and File Review
 4. Response to Dredging Committee Questions
Correspondence dated 6/24/10 from GEL Engineering, LLC
 5. GEL Bid Evaluation
E-mail dated 5/14/10 from Chris Creed/Olsen Associates, Inc.
 6. Dredging Cost Comparison Evaluation
Correspondence dated 5/4/10 from GEL Engineering, LLC
 7. Initial Review of Dredging Related Issues in Sea Pines Plantation
Correspondence dated 1/22/10 from Olsen Associates, Inc.
-

D. Joint Resolution by CSA and ASPPPO

ASPPPO

Association of Sea Pines Plantation Property Owners, Inc.
and

CSA

Community Services Associates, Inc.

COMMUNITY SERVICES ASSOCIATES, INC. (CSA) ASSOCIATION OF SEA PINES PLANTATION PROPERTY OWNERS, INC. (ASPPPO) Board of Directors Joint Resolution

WHEREAS, the Sea Pines Waterways Task Force (the Task Force) issued its Final Report (the Report) on August 19, 2011 which stated:

- "1. The Task Force analyzed all methods for dredging Harbour Town Marina, Braddock Creek, including South Beach Marina, private docks at Gull Point, Portside and Port Villas, and Baynard Creek (collectively referred to herein as the Sea Pines Waterways).
2. During this time the Task Force consulted independent engineers, government officials including regulators, dredging contractors and others. The Task Force also reviewed numerous publications and regulations concerning dredging operations and procedures.
3. The Task Force reviewed the various dredging methods including mechanical and hydraulic. The Task Force learned that hydraulic dredging is preferred by regulators and would be the least expensive and most effective method for the Sea Pines Waterways.
4. The Task Force reviewed methods for disposal of the dredge material including disposal at a land based disposal site, off shore at a federally approved dredge material disposal site, use of dewatering techniques using polymers or geotextile tubes, and open water disposal. The Task Force confirmed that open water disposal is specifically authorized in state dredging regulations and has been used by the Army Corps of Engineers in South Carolina waterways.
5. The process for obtaining a permit for open water disposal involves complying with a joint protocol of the Army Corps of Engineers (the Corps) and the U.S. Environmental Protection Agency (the EPA) and complying with a S.C. Department of Health Environmental Control protocol. Certain Task Force members have had meetings with these regulators and the Chief of the Regulatory Division of the Charleston District of the Corps has offered to coordinate a task force to pursue compliance with the various protocols.
6. The Task Force considered the impact of these various dredge and disposal methods on the Sea Pines Community and surrounding environment. The Task Force concluded that hydraulic dredging with open water disposal would have the least adverse impacts on our community and the surrounding environment.
7. The Task Force carefully considered cost information on the various dredging and disposal methods. The Task Force learned that hydraulically dredging the Sea Pines Waterways with open water disposal would be by far the least expensive of all the methods considered.
8. The Task Force considered the adverse effects of not dredging the Sea Pines Waterways including the effects on the Heritage Golf Tournament, tourism in general and more specifically at Harbour Town and the South Beach Village, gate fees and on the values of our homes throughout Sea Pines. The Task Force concluded that there would be significant adverse effects if dredging were not conducted as soon as possible.
9. The Task Force considered the opinions of our residents through the 2009 residents' survey, which revealed overwhelming support for maintaining the navigability of the Sea Pines Waterways, and through various open meetings in our community lead by CSA and ASPPPO. The consensus from those meetings was enthusiastic support for dredging the Sea Pines Waterways hydraulically with open water disposal." ; and

WHEREAS, the Report concluded:

"Having considered the environmental, economic, social, legal and technological suitability of hydraulic dredging with open water disposal for the Sea Pines Waterways, the Task Force concludes that they are the only feasible methods for dredging the Sea Pines Waterways and that there are no feasible alternatives."

Now **THEREFORE**, be it resolved this 27th day of November 2011 that the CSA and ASPPPO Boards of Directors, considering the Task Force findings with respect to the environmental, economic, social, legal and technological suitability, hereby:

1. Endorse the needed dredging of Sea Pines Waterways using hydraulic dredging with open water disposal;
2. Offer active support and encouragement for efforts which will facilitate such dredging;
3. Urge South Island Dredging Association to pursue permitting for hydraulic dredging with open water disposal and as soon as possible, develop and implement a plan, including necessary funding, to obtain permits for hydraulic dredging and open water disposal in accordance with procedures recommended by the consulting engineers;
4. Urge South Island Dredging Association to work with Sea Pines leadership in leading a coordinated effort to gain the acceptance of and support for open water disposal for Sea Pines dredging operations, by government officials, regulators and environmental interest groups ; and
5. Encourage the Sea Pines Community to support hydraulic dredging with open water disposal in order to maintain navigable Sea Pines Waterways.

Community Services Associates, Inc.

By John W. McLauchlin
John McLauchlin, President

Association of Sea Pines Plantation Property Owners

By Michael Hellman
Michael Hellman, President



April 30, 2010

Mr. Cary Kelley
Sea Pines Waterways Task Force
Community Services Associates
175 Greenwood Drive
Hilton Head Island, SC 29928

Dear Cary:

As you are aware, the Sea Pines Waterways Task Force and the South Island Dredging Association have requested the use of 30 to 40 acres of property in the Sea Pines Forest Preserve (the "Forest Preserve") owned by Sea Pines Resort, LLC, for the upland disposal of dredge spoils from Harbour Town, South Beach and other waterways within Sea Pines. After careful consideration and discussion, we hereby deny the request for the use of any part of the Forest Preserve for this purpose.

We have an obligation to protect the Forest Preserve as it is currently a glorious, pristine natural area enjoyed by many residents of Sea Pines, as well as thousands of tourists and other visitors of the Resort, for outdoor activities such as hiking and nature walks. Using the Forest Preserve for the disposal of dredge spoils would forever alter the distinct eco-system and permanently mar the beauty of the Forest Preserve.

Please call me if you would like to discuss this matter further.

Sincerely,



Steven P. Birdwell
President

SPB/ml

cc: Mark King, South Island Dredging Association

F. Documentation from The Calibogue Cay Property Owners Denying Harbour Town Slip Owners Use of the Calibogue Cay CDF

From: Mark Griffith [<mailto:mag51256@gmail.com>]

Sent: Wednesday, September 21, 2011 6:54 PM

To: Mark King

Subject: Re: Calibogue Update

Mark:

Just finished our CCPOA Board Meeting and the Board has voted not to proceed with the slip owners proposal. We will not be moving forward to modify our covenants to allow the Harbour Town Slip owners to use the CC disposal site. Should you wish further explanation please let me know?

Mark

On Sep 20, 2011, at 11:03 AM, "Mark King" <mking@cglhhi.com> wrote:

Mark,

Could you give me an update on the Calibogue Cay vote?

Thanks,

Mark

Mark H. King

President

The Club Group, Ltd.

71 Lighthouse Rd. Suite 300

Hilton Head Island, SC 29928

T: 843.363.5699

F: 843.363.5799



June 8, 2012

Thomas Hutto, P.E., Principal
GEL Engineering LLC
PO Box 30712 - Charleston, SC 29417



BY:

Sea Pines Waterways Restoration Project

Dear Tom:

At your request, I have reviewed the letter dated July 1, 2000, from my predecessor at CSA, Ward Kirby, to the then President of SIDA concerning either using Calibogue Cay's CDF or building a CDF in Sea Pines for dredge material from Harbour Town Yacht Basin, Braddock Creek or Baynard Creek. As you know, I served as Chairman of the Sea Pines Waterways Task Force and spent more than 18 months evaluating any and all methods for restoring our waterways.

As part of our review process we considered using the Calibogue Cay CDF. You conducted a study of the site for us. We did all we could to have the Calibogue Property Owners Association allow Harbour Town to use the Calibogue Cay CDF, even for just a one-time use. As you know, there is a covenant that restricts use of their CDF to dredge spoils from the creek on the east side of the Calibogue Cay neighborhood. The property owners would not agree to an amendment of the covenant, thus ending any hope of using that CDF for any other dredge material.

We also considered every potential piece of property within Sea Pines, including the Forest Preserve, Lawton Stables, Egret Island and certain parcels owned by CSA that lie south of Baynard Creek. These parcels are discussed in Ward Kirby's letter of July 1, 2000. In short, nothing has changed from Ward's letter in so far as using these properties for a CDF. For various reasons that are described in Ward's letter none is available for use as a CDF.

Sincerely,

Cary Kelley
CSA, Executive Vice President

MARCOL DREDGING CO.

2015 COSGROVE AVENUE • NORTH CHARLESTON, S.C. 29405 • PHONE (843) 747-2177

CRAIG LAVELLE
PRESIDENT

MAILING ADDRESS:
P.O. BOX 71287
NORTH CHARLESTON, S.C. 29415

June 7, 2010

VIA Email: jtw@gel.com

Mr. Jack Walker
GEL Engineering, LLC
P. O. Box 30712
Charleston, SC 29417

Re: Dredging at Harbortown, Braddock Cove Creek
and Baynard Creek

Dear Mr. Walker:

Marcol Dredging Company appreciates the opportunity to work with you on the above-referenced dredging project.

- This quote is for mobilizing a 10" swinging ladder dredge and related pipeline/submerge line.
- The dredging activity will be allowed to proceed on a 24 hour per day, 7 days per week basis.
- A hydrographic survey will be performed before, during, and after dredging.
- This quote is not for the removal of rock.
- This quote is based on fuel prices at \$2.40 per gallon. If the price fluctuates by 15% or more, there will be a price adjustment.
- This quote is based on a disposal site one mile from entrance (one mile of submerged pipe per location).
- This quote is good for thirty days.

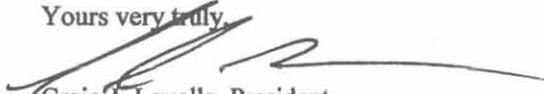
Quote

Harbortown = 67,000 cy	
Mobilization	\$ 135,000.00
Dredging – 67,000 cy x \$8.65 per yard	\$ 579,550.00
Braddock Cove Creek = 155,000 cy	
Mobilization	\$ 141,000.00
Dredging – 155,000 cy x \$7.60 per yard	\$1,178,000.00
Baynard Creek = 115,000 cy	
Mobilization	\$ 141,000.00
Dredging – 115,000 cy x \$7.60 per yard	\$ 874,000.00

Mr. Jack Walker
June 7, 2010
Page Two

If you determine this proposal needs to be modified to better meet your needs, please let us know. If you have any questions or need additional information, please do not hesitate to call us at (843) 747-2177. We appreciate the opportunity to quote the above-referenced project and we look forward to working with you in the future.

Yours very truly,



Craig J. Lavelle, President
Marcol Dredging Company

CJL/jk

I. Moffatt Nichol Estimate for Inland Open Water Disposal

General Dredging Specification

- Shallow Draft Cutter Head Pipeline Dredge
 - 10-12" pipe
 - Shallow draft for marina depths
 - 2-3 mile submerged discharge pipeline
 - Up to two booster pumps may be necessary
 - Submerged disposal with Tremie pipe and diffuser to place on bottom and minimize water column impact
 - Up to 1500 cubic yards per day production
 - Project duration 130+ days

- Cost (Gross Estimate)
 - \$150K mob & demob
 - \$10-15 per foot of pipeline installation (\$150K - \$225K for 15,000 feet max)
 - Dredging at about \$10 per cubic yard @ 200K cubic yds = \$2 million
 - Total cost could be \$2.4 million

- Environmental Assessments to support 404(b)1 permit application - \$??