

**SEDIMENT QUALITY CONTROL/QUALITY ASSURANCE PLAN
FOR BEACH RESTORATION OR NOURISHMENT USING AN OFFSHORE BORROW AREA**

[FDEP File No. 0307741-002-JC]

USACE

DADE COUNTY BEC & HP CONTRACT G

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A. INTRODUCTION

This plan is for use for beach restoration and beach nourishment when an offshore borrow area(s) is used. A different plan document will be used for inlet excavation involving beach or nearshore placement of dredged material

Pursuant to Fla. Admin. Code r. 62B-41.008 (1) (k) 4.b., permit applications for inlet excavation, beach restoration, or nourishment shall include a quality control/assurance plan that will ensure that the sediment from the borrow areas to be used in the project will meet the standard in Fla. Admin. Code r. 62B-41.007(2)(j). To protect the environmental functions of Florida's beaches, only beach compatible fill shall be placed on the beach or in any associated dune system. Beach compatible fill is material that maintains the general character and functionality of the material occurring on the beach and in the adjacent dune and coastal system.

USACE has conducted geotechnical investigations that provide adequate data concerning the character of the sediment and the quantities available within the spatial limits of the permitted borrow area. The USACE has provided an analysis of the existing or native sediment and the sediment within the permitted borrow area(s) that demonstrates its compatibility with the naturally occurring beach sediment in accordance with Fla. Admin. Code r. 62B-41.007(2)(j). The sediment analysis and volume calculations were performed using established industry standards,

Based upon this information and the design of the borrow area, the Department of Environmental Protection (Department) has determined that use of the sediment from the borrow area will maintain the general character and functionality of the sediment occurring on the beach and in the adjacent dune and coastal system. Furthermore, this information and the borrow area design provides sufficient quality control/quality assurance (QC/QA) that the mean grain size and carbonate content of the sediment from the borrow area will meet the requirements of Fla. Admin. Code r. 62B-41.007(2)(j); hence, additional QC/QA procedures are not required for these sediment parameters during construction.

This plan outlines the responsibilities of each stakeholder in the project as they relate to the placement of beach compatible material on the beach. These responsibilities are in response to the possibility that non-beach compatible sediments may exist within the borrow area and could be unintentionally placed on the beach. Section C. Quality Control Plan specifies the minimum construction management, inspection and reporting requirements placed on the Marine Dredging Contractor and enforced by the Permittee, to ensure that the sediment from the borrow area(s) to be used in the project meet the compliance specifications. Section D. Quality Assurance Plan specifies the minimum construction oversight, inspection and reporting requirements to be undertaken by the Permittee or the Permittee's On-Site Representative to observe, sample, and test the placed sediments to verify the sediments are in compliance.

B. SEDIMENT QUALITY SPECIFICATIONS

The sediment from the borrow area is similar in Munsell color and grain size distribution to the material in the existing coastal system at the beach placement site. The Department, the Permittee and USACE acknowledge that it is possible that discrete occurrences of non-beach compatible sediments may exist within the permitted borrow area(s) that do not comply with the limiting parameters of Fla. Admin. Code r. 62B-41.007(2)(j) 1. – 5., or vary in Munsell color from the composite value. Furthermore, the Department, permittee and USACE may consider more

restrictive values for the sediment parameters to ensure that the sediment from the borrow area is similar in color and grain size distribution to the sediment in the existing coastal system at the beach placement site. Therefore, fill material compliance specifications for the sediment from the borrow area proposed for this project are provided in Table 1.

The compliance specifications take into account the variability of sediment on the native or existing beach, and are values which may reasonably be attained given what is known about the borrow area sediment. Beach fill material which falls outside of these limits will be considered unacceptable and subject to remediation, excepting to the extent that it is determined through sampling that the natural beach exceeds any of the limiting parameters listed in Table 1, then the fill material shall not exceed the naturally occurring level for that parameter.

The compliance values described in Table 1 refer to the average values assessed over 10,000 square feet are of the placed fill material in accordance with 62B-41.007(2)(j) F.A.C. Owing to the natural variability of the fill material, it is recognized that individual samples may deviate from the specified compliance values.

Table 1- Sediment Compliance Specifications

Sediment Parameter	Parameter Definition	Compliance Value
Max. Silt Content	passing #230 sieve	5%
Max. Gravel Content*	retained on #4 sieve	5%
Munsell Color Value	moist Value (chroma = 1)	6 or lighter
The beach fill material shall not contain construction debris, toxic material, other foreign matter, coarse gravel or rocks.		

*Gravel Content is used as the indicator of shell content for the implementation of quality control/quality assurance procedures.

C. QUALITY CONTROL PLAN

The contract documents shall incorporate the following technical requirements, or equivalent language that addresses the location of dredging, sediment quality monitoring on the beach, and, if necessary, remedial actions. The Permittee will seek to enforce these contract requirements during the execution of work.

1. Electronic Positioning and Dredge Depth Monitoring Equipment. Dredge plants will be equipped with horizontal and vertical control systems that provide the operator with the position of the excavation device, as appropriate. The electronic positioning equipment will be continuously operated to monitor the positioning of the dredge location(s). The dredge positioning equipment will have a horizontal accuracy equal to or better than plus/minus 5 feet. Vertical positioning shall account for tides and have an accuracy of plus/minus 0.5 foot. If a known permit violation occurs, the dredge positioning data will be made available for review at the USACE District Office.

2. Dredge Location Control. The Contractor is required to have, in continuous operation on the dredge, electronic positioning equipment that will accurately compute and plot the position of the dredge. Such fixes, and the accompanying plots, will be furnished to the QAR daily as part of the QC Reports. The electronic positioning equipment will be installed on the dredge so as to monitor, as closely as possible, the actual location of the excavation device(s). A printout of the excavation device positions in State Plane Coordinates, the excavation device depths corrected for tide elevation and referenced to the North American Vertical Datum of 1988 (NAVD 88) and the time, will be maintained using an interval of two (2) minutes for each printed fix. A printed and computer file (in ASCII format) copy of the position data will be provided to the USACE as part of the daily report. The Contractor will prepare a plot of the data that includes the State Plane Coordinate grid system and the borrow area limits. The format of the plot may be subject to approval by the USACE. No dredging will take place outside of the borrow area limits (horizontal and vertical limits) as shown on the drawings.

3. Dredging Observation. The Contractor will be responsible for establishing such control as may be necessary to insure that the allowable excavation depths and spatial limits are not exceeded. If the Contractor observes obviously

noncompliant sediment during dredging, the Contractor will cease dredging, will verbally notify the QAR, providing the time, location, and description of the noncompliant sediment and relocate the dredge into compliant sediment. The Contractor will also report any encounters with noncompliant sediment in the Contractor's Daily Report, providing depth and location in State Plane Coordinates of said materials within the borrow area. The Contractor and USACE will use the dredge positioning records, plans, and vibracore descriptions to determine where the Contractor may dredge to avoid additional placement of noncompliant sediment. The Contractor will adjust his or her construction operation to avoid the noncompliant sediment to the greatest extent practicable.

4. **Beach Observation.** The Contractor will continuously visually monitor the material being placed on the beach for unacceptable material. If occasional debris, trash, rocks, or silty materials appear on the beach during dredging operations and appear to exceed background or existing levels, the Contractor will remediate as specified in the contract. The excavation location of unacceptable material will be provided with the DEP notification required in the Remediation Action section below. If significant sediment exceeding the project target values is placed on the beach, the contractor shall notify the USACE QAR or designated alternate and proceed as described in Section E below. If the contractors QC personnel observe a significant pattern of non-compliant material, such as streaking, a lens or non-compliant material, they will contact the QAR within 60 minutes.

If the material exhibits an unusual color, abnormally foul odor or produces a petroleum sheen, dredging shall be discontinued immediately by lifting or moving the excavation device and the discharge pipe flushed clean by continuing to pump water only through the line. Once the line has been flushed clear of solids, pumping may be discontinued. The QAR shall be notified immediately in this situation.

5. **Excavation Requirements.** The Contractor will excavate within the approved boundaries and maximum depths of the borrow area in a uniform and continuous manner. If directed by USACE, the Contractor will change the location and/or depth of excavation within the borrow area limits.

6. **Vibracore Logs and Grain Size Data.** The Contractor will be provided with all descriptions of sediment vibracore borings collected within the borrow area, and will acknowledge that he is aware of the quality of the sediment as described in the sediment vibracore logs. These logs and grain size data will be presented in the construction specifications.

7. **Noncompliant Material Handling Provision.** The Contractor shall have plans and equipment available for use to handle any noncompliant material encountered during dredging. Any debris placed on the beach shall be handled under the guidelines set forth in Section E. below.

D. QUALITY ASSURANCE PLAN

The USACE may use the contractor's daily reports, plans, and sample descriptions to determine where the Contractor may dredge to avoid placement of unacceptable materials. The USACE will adjust the construction operation to avoid placement of the unacceptable material on the beach to the greatest extent practicable. The USACE will determine where non-beach compatible material will be disposed of if encountered. Remediation actions are discussed in Section E below.

The Permittee will enforce the construction contract and Department permits related to sediment quality. In order to do so, the following steps shall be followed:

1. **Construction Observation.** Construction observation by the USACE Quality Assurance Representative (QAR) will be performed during periods of active placement. Most observations will be conducted during daylight hours. However, random nighttime observations may be conducted.

2. **On-Site Representative.** The USACE will provide a QAR with training or experience in beach nourishment and construction inspection and testing, and who are knowledgeable of the project design and permit conditions.

3. **Pre-Construction Meeting.** The project QC provisions to be implemented by the Contractor will be discussed as a matter of importance at the coordination meeting. The Contractor will be required to acknowledge the goals and intent of the above described QC Plan at the coordination meeting.

4. **Contractor's Daily Reports.** The USACE will review the Contractor's Daily Reports which characterize the nature of the sediments encountered at the borrow area and placed along the project shoreline with specific reference to moist sand color and the occurrence of rock, rubble, shell, silt or debris that exceeds acceptable limits. USACE will review the dredge positions in the Contractor's Daily Report.

5. **On Call.** The QAR will be continuously on call during the period of construction for the purpose of making decisions regarding issues that involve QC/QA Plan compliance.

6. **Modifications.** Any modification to the Contract between the USACE and the Contractor will be evaluated to determine whether or not the change in scope will potentially affect the QC\QA Plan.

7. **During Construction Sampling for Visual Inspection.** To assure that the fill material placed on the beach is in compliance with the permit, the USACE will conduct assessments of the beach fill material as follows:

a. During excavation and fill placement activities, the Permittee's On-Site Representative will collect a sediment sample at not less than 200-foot intervals of newly constructed berm to visually assess grain size, Munsell color, shell content, and silt content. The sample shall be a minimum of 1 U.S. pint (approximately 200 grams). This assessment will consist of handling the fill material to ensure that it is predominantly sand, to note the physical characteristics and assure the material meets the sediment compliance parameter specified in this Plan.

If deemed necessary, quantitative assessments of the sand will be conducted for grain size, silt content, shell content and Munsell color using the methods outlined in section F.2 Each sample will be archived with the date, time, and location of the sample. The results of these daily inspections, regardless of the quality of the sediment, will be appended to or notated on the Contractor's Daily Report. All samples will be stored by USACE for at least 60 days after the project's physical completion.

b. If USACE determines that the beach fill material does not comply with the sediment compliance specifications in this QC/QA Plan, the USACE will instruct the Contractor to cease material excavation operations and take whatever actions necessary to avoid further discharge of noncompliant sediment. The Contractor, in cooperation with USACE, will use the dredge positioning records, plans, and vibracore descriptions to determine where the Contractor may dredge to avoid additional placement of noncompliant sediment. The Contractor will adjust his or her construction operation to avoid the noncompliant sediment to the greatest extent practicable. The sediment inspection results will be reported to the Department.

E. REMEDIATION

1. **Compliance Area.** If a sample does not meet the compliance value for construction debris, toxic material, other foreign material, coarse gravel, or rock USACE shall determine the aerial extent and remediate regardless of the extent of the noncompliant material. If a sample is noncompliant for the silt content, shell content, or Munsell color and the aerial extent exceeds 10,000 square feet, USACE shall remediate.

2. **Notification.** If an area of newly constructed beach does not meet the sediment compliance specifications, then the Department (JCPCCompliance@dep.state.fl.us) will be notified. Notification will indicate the aerial extent and location of any areas of noncompliant beach fill material and remediation planned. As outlined in section E.4 below, USACE will immediately undertake remediation actions without additional approvals from the Department. The results of any remediation will be reported to the Department following completion of the remediation activities and shall indicate the volume of noncompliant fill material removed and replaced.

3. **Sampling to determine extent.** In order to determine if an area greater than 10,000 square feet of beach fill is noncompliant, the following procedure will be performed by USACE:

a. Upon determination that the first sediment sample is noncompliant, at minimum, five (5) additional sediment samples will be collected at a 25-foot spacing in all directions and assessed. If the additional samples are also noncompliant, then additional samples will be collected at a 25-foot spacing in all directions until the aerial extent is identified.

- b. The samples will be visually compared to the acceptable sand criteria. If deemed necessary by USACE, quantitative assessments of the sand will be conducted for grain size, silt content, shell content, and Munsell color using the methods outlined in section F.2. Samples will be archived by USACE.
- c. A site map will be prepared depicting the location of all samples and the boundaries of all areas of noncompliant fill.
- d. The total square footage will be determined.
- e. The site map and analysis will be included in the Contractor's Daily Report.

4. **Actions.** USACE shall have the authority to determine whether the material placed on the beach is compliant or noncompliant. If placement of noncompliant material occurs, the Contractor will be directed by USACE on the necessary corrective actions. Should a situation arise during construction that cannot be corrected by the remediation methods described within this QC/QA Plan, the Department will be notified. The remediation actions for each sediment parameter are as follows:

- a. Silt: blending the noncompliant fill material with compliant fill material within the adjacent construction berm sufficiently to meet the compliance value, or removing the noncompliant fill material and replacing it with compliant fill material.
- b. Shell: blending the noncompliant fill material with compliant fill material within the adjacent construction berm sufficiently to meet the compliance value or removing the noncompliant fill material and replacing it with compliant fill material.
- c. Munsell color: blending the noncompliant fill material with compliant fill material within the adjacent construction berm sufficiently to meet the compliance value or removing the noncompliant fill material and replacing it with compliant fill material.
- d. Coarse gravel: screening and removing the noncompliant fill material and replacing it with compliant fill material.
- e. Construction debris, toxic material, or other foreign matter: removing the noncompliant fill material and replacing it with compliant fill material.

All noncompliant fill material removed from the beach will be transported to an appropriate location approved by USACE located landward of the Coastal Construction Control Line.

5. **Post-Remediation Testing.** Re-sampling shall be conducted following any remediation actions in accordance with the following protocols:

- a. Within the boundaries of the remediation actions, samples will be taken at maximum of 25-foot spacing.
- b. The samples will be visually compared to the acceptable sand criteria. If deemed necessary by USACE, quantitative assessments of the sand will be conducted for grain size, silt content, and Munsell color using the methods outlined in section F.2. Samples will be archived by USACE.
- c. A site map will be prepared depicting the location of all samples and the boundaries of all areas of remediation actions.

6. **Reporting.** A post-remediation report containing the site map, sediment analysis, and volume of noncompliant fill material removed and replaced will be submitted to the Department within 14 days following completion of remediation activities.

F. POST-CONSTRUCTION SAMPLING FOR LABORATORY TESTING

To assure that the fill material placed on the beach was adequately assessed by the borrow area investigation and design, the USACE will conduct assessments of the sediment as follows:

1. Post-construction sampling of each acceptance section and testing of the fill material will be conducted to verify that the sediment placed on the beach meets the expected criteria/characteristics provided during the geotechnical investigation and borrow area design process. Upon completion of an acceptance section of constructed beach, USACE will collect two (2) duplicate sand samples at each Department reference monument profile line to quantitatively assess the grain size distribution, moist Munsell color, shell content, and silt content for compliance. USACE will collect the sediment samples of a minimum of 1 U.S. pint (at least 200 grams) each from the bottom of a test hole 6 to 18 inches deep within the limits of the constructed berm. USACE will visually assess grain size,

Munsell color, shell content, and silt content of the material by handling the fill material to ensure that it is predominantly sand, and further to note the physical characteristics. USACE will note the existence of any layering or rocks within the test hole. One sample will be sent for laboratory analysis while the other sample will be archived by the Permittee. All samples and laboratory test results will be labeled with the Project name, FDEP Reference Monument Profile Line designation, State Plane (X,Y) Coordinate location, date sample was obtained, and "Construction Berm Sample."

2. All samples will be evaluated for visual attributes (Munsell color and shell content), sieved in accordance with the applicable sections of ASTM D422-63 (Standard Test Method for Particle-Size Analysis of Soils), ASTM D1140 (Standard Test Method for Amount of Material in Soils Finer than No. 200 Sieve), and ASTM D2487 (Classification of Soils for Engineering Purposes), and analyzed for carbonate content. The samples will be sieved using the following U.S. Standard Sieve Numbers: 3/4", 5/8", 3.5, 4, 5, 7, 10, 14, 18, 25, 35, 45, 60, 80, 120, 170, and 230. Testing shall be performed by a USACE-validated laboratory.

3. A summary table of the sediment samples and test results for the sediment compliance parameters shall accompany the complete set of laboratory testing results. The column headings will include: Sample Number; Mean Grain Size (mm); Sorting Value; Silt Content (%); Shell Content (%); Munsell Color Value; and a column stating whether each sample MET or FAILED the compliance values found in Table 1. The sediment testing results will be certified by a P.E or P.G. from the testing laboratory. A statement of how the placed fill material compares to the sediment analysis and volume calculations from the sand search investigation and borrow area design shall be included in the sediment testing results report. USACE will submit sediment testing results and analysis report to the Department within 90 days following beach construction.

All reports or notices relating to this permit shall be emailed and sent to the Department at the following locations:

DEP Bureau of Beaches & Coastal Systems

JCP Compliance Officer

Mail Station 300

3900 Commonwealth Boulevard

Tallahassee, Florida 32399-3000

phone: (850) 414-7716

e-mail: JCPCCompliance@dep.state.fl.us

End of Plan