ATTACHMENT 1

SEDIMENT QUALITY ASSURANCE/ QUALITY CONTROL PLANS

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

[FDEP Permit No.]TBD

Indian River County, FL

Sector 7

January 24, 2019

A. INTRODUCTION

As indicated in the title above, this template plan is for use for beach restoration and beach nourishment when an offshore borrow area 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.

The Permittee 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(s). The Permittee 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 beach volume calculations were performed using established industry standards, and are certified by a Professional Engineer or a Professional Geologist registered in the State of Florida.

Based upon this information and the design of the borrow area(s), the Department of Environmental Protection (Department) has determined that use of the sediment from the borrow area(s) 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 sediment from the borrow area(s) will comply with the requirements of Fla. Admin. Code r. 62B-41.007(2)(j); hence, additional QC/QA procedures beyond those described in this permit 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(s) and could be unintentionally placed on the beach. The QC 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. The QA 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(s) is similar in Munsell color and grain size distribution to the material in the existing coastal system at the beach placement site. The Department and the Permittee 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 may consider more restrictive values for the sediment

parameters to ensure that the sediment from the borrow area(s) 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(s) 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, as described in Section E.

Table 1- Sediment Compliance Specifications

Sediment Parameter	**Parameter Definition**	**Compliance Value**
Mean Grain Size*	**Calculated by moment method**	**0.33 mm – 0.55 mm**
Max. Silt Content	passing #230 sieve	**2%**
Max. Gravel Content*	retained above #4 sieve	**2%**
Munsell Color Value	moist Hue	**10YR, 2.5Y, or 5Y**
	moist Value	**≥ 6**
	moist Chroma	**≤ 2**
The beach fill material shall not contain coarse gravel or rocks, construction debris, toxic material, or other foreign matter.		

*Determined using the sieve numbers listed in Section D.7.b.

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. The following quality control plan shall be

1. **Electronic Positioning and Dredge Depth Monitoring Equipment**. The Contractor will continuously operate electronic positioning equipment, approved by the Engineer, to monitor the precise positioning of the excavation device location(s) and depth(s). A Differential Global Positioning System (DGPS) or equivalent system providing equal or better accuracy will be used to determine the horizontal position and will be interfaced with an appropriate depth measuring device to determine the vertical position of the bottom of the excavation device. The horizontal positioning equipment will maintain an accuracy of +/- 3.0 feet. The vertical positioning equipment will maintain a vertical accuracy of +/-0.5 feet with continuous applicable tidal corrections measured at the project site.

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 Permittee's on-site representative 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). The location of the master antenna on the dredge and the distance and direction from the master antenna to the bottom of the excavation device will be reported on the Daily Reports. 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 Engineer 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 Permittee's Engineer. 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 ensure that the allowable excavation depths and spatial limits are not exceeded. If the Contractor encounters

noncompliant sediment during dredging, the Contractor will immediately cease dredging, relocate the dredge into compliant sediment, and will verbally notify the Permittee's On-site Representative, providing the time, location, and description of the noncompliant 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, in cooperation with the Permittee's Engineer, 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 sediment being placed on the beach to assess grain size, silt content, gravel content, and Munsell color. If noncompliant sediment is placed on the beach, the Contractor will immediately cease dredging, relocate the dredge into compliant sediment, and verbally notify the Permittee's On-site Representative, providing the time, location, and description of the noncompliant 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 will take the appropriate remediation actions as directed by the Permittee or Permittee's Engineer.

5. **Excavation Requirements**. The Contractor will excavate within the approved boundaries and maximum depths of the borrow area(s) in a uniform and continuous manner. If directed by the Permittee's Engineer, 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(s), 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.

D. QUALITY ASSURANCE PLAN

The Permittee will seek to 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 and Sampling for Visual Assessment.** Construction observation by the Permittee's On-Site Representative will be performed 7 days a week, at least 8 hours a day during periods of active construction. Most observations will be conducted during daylight hours; however, random nighttime observations shall be conducted.

2. **On-Site Representative.** The Permittee will provide on-site observation by individuals with training or experience in beach nourishment and construction inspection and testing, and who are knowledgeable of the project design and permit conditions. The Engineer, a qualified coastal engineer, will actively coordinate with the Permittee's On-Site Representative, who may be an employee or sub-contractor of the Permittee or the Engineer. Communications will take place between the Engineer and the Permittee's On-Site Representative on a daily basis during periods of active construction.

3. **Pre-Construction Meeting.** The project QC/QA Plan will be discussed as a matter of importance at the pre-construction meeting. The Contractor will be required to acknowledge the goals and intent of the above described QC/QA Plan, in writing, prior to commencement of construction.

4. **Contractor's Daily Reports.** The Engineer or Permittee's On-Site Representative 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 sand color and the occurrence of rock, rubble, shell, silt or debris that exceeds acceptable limits. The Engineer will review the dredge positions in the Contractor's Daily Report.

5. **On Call.** The Engineer 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. **Addendums.** Any addendum or change order to the Contract between the Permittee 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 Engineer or Permittee's On-Site Representative 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 D.8.b. 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 the Permittee for at least 60 days after project completion.

b. If the Permittee or Engineer determines that the beach fill material does not comply with the sediment compliance specifications in this QC/QA Plan, the Permittee or Engineer will immediately 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 the Permittee's Engineer, 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.

8. **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 Engineer will conduct assessments of the sediment as follows:

a. 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 from the geotechnical investigation and borrow area design process. Upon completion of an acceptance section of constructed beach, the Engineer 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. The Engineer 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 a minimum of 18 inches deep within the limits of the constructed berm. The Engineer 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. The Engineer 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."

b. 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, 200, and 230.

c. 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. registered in the State of Florida. 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. The Permittee will submit sediment testing results and analysis report to the Department within 90 days following beach construction.

d. In the event that a section of beach contains fill material that is not in compliance with the sediment compliance specifications, then the Department will be notified. Notification will indicate the volume, aerial extent and location of any unacceptable beach areas and remediation planned.

E. REMEDIATION

1. **Compliance Area.** If a sample does not meet the compliance requirement to not contain coarse gravel or rocks, value for construction debris, toxic material, other foreign material, coarse gravel, or rock the Permittee 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, the Permittee shall remediate.

2. **Notification.** If an area of newly constructed beach does not meet the Sediment Compliance Specifications, then the Department (JCPCompliance@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, the Permittee 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 the Engineer:

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 the Engineer, quantitative assessments of the sand will be conducted for grain size, silt content, shell content, and Munsell color using the methods outlined in section D.8.b. Samples will be archived by the Permittee.
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.** The Permittee or Engineer 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 the Permittee or Engineer 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 upland disposal facility 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 assessed to evaluate compliance with the Sediment Compliance Specifications. If deemed necessary by the Engineer, quantitative assessments of the sand will be conducted for grain size, silt content, gravel content, and Munsell color using the methods outlined in Section D.8.b. Samples will be archived by the Permittee.

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 7 days following completion of remediation activities.

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

FDEP Division of Water Resource Management
JCP Compliance Officer
Mail Station 3544
2600 Blair Stone Road
Tallahassee, Florida 32399
phone: (850) 414-7716
e-mail: JCPCompliance@dep.state.fl.us

End of Plan

FDEP Version dated September 4, 2009

SEDIMENT QUALITY CONTROL/QUALITY ASSURANCE PLAN
FOR BEACH OR DUNE RESTORATION USING AN UPLAND SAND SOURCE

FDEP Permit No. TBD

Indian River County, FL
Sector 7
January 24, 2019

A. INTRODUCTION

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.

The Permittee has conducted geotechnical investigations that provide adequate data concerning the character of the sediment and the quantities available within the spatial limits of the upland sand source(s). The Permittee has provided an analysis of the existing or native sediment and the sediment within the permitted upland sand source(s), including the methods of mining and post-mining processing, 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 beach volume calculations were performed using established industry standards, and are certified by a Professional Engineer or a Professional Geologist registered in the State of Florida.

Based upon this information, the Department of Environmental Protection (Department) has determined that use of the sediment from the upland sand source(s) 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 provides sufficient quality control/quality assurance (QC/QA) that the sediment from the upland sand source(s) will comply with the requirements of Fla. Admin. Code r. 62B-41.007(2)(j); hence, additional QC/QA procedures beyond those described in this permit 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 upland sand source(s) and could be unintentionally placed on the beach. The QC Plan specifies the minimum construction management, inspection and reporting requirements placed on the Contractor and enforced by the Permittee, to ensure that the sediment from the upland sand source(s) to be used in the project meet the compliance specifications. The QA 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 upland sand source(s) is similar in grain size distribution and Munsell color to the material in the existing coastal system at the beach placement site. The Department and the Permittee acknowledge that it is possible that discrete occurrences of non-beach compatible sediments may exist within the permitted upland sand source(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 may consider more restrictive values for the sediment parameters to ensure that the sediment from the upland sand source(s) is similar in grain size distribution and 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 upland sand source(s) 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 upland sand source(s). Beach fill material which falls outside of these limits will be considered unacceptable and subject to remediation, as described in Section E.

Table 1- Sediment Compliance Specifications

Sediment Parameter	**Parameter Definition**	**Compliance Value**
Median Grain Size*	**50% larger/smaller by weight***	**0.30 mm – 0.55 mm**
Mean Grain Size*	Calculated by moment method	**0.33 mm – 0.55 mm**
Silt Content	passing #230 sieve	**≤2%**
Gravel Content*	retained above #4 sieve	**≤2%**
Munsell Color	moist Hue	**10YR, 2.5Y, or 5Y**
	moist Value	**≥ 7**
	moist Chroma	**≤ 2**
The beach fill material shall not contain coarse gravel or rocks, construction debris, toxic material, or other foreign matter.		

*Determined using the sieve numbers specified in section D.7.b.

C. QUALITY CONTROL PLAN

The contract documents shall incorporate the following technical requirements, or equivalent language that addresses the 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. For each construction event, the Contractor shall submit a Quality Control Plan review and acceptance by the Permittee. This Plan shall comply with the quality control measures set forth in this permit, and address sediment quality assurance by including: (1) the specific sampling frequency and testing methodology to be provided by the Contractor, (2) the name, address and point of contact for the Licensed Testing Laboratory to be used for the required collection of samples and laboratory testing, and (3) how the Contractor intends to assess compliance with the Sediments Compliance Specifications as shown in Table 1.

The characteristics of the in-situ materials in the upland sand source(s) are indicated by geotechnical data. The Contractor should be aware that it is possible for in-situ material of differing characteristics to be present and that the mining process may correspondingly require revisions during construction to produce beach compatible sand consistent with the Sediment Compliance Specifications in Table 1.

1. **Assessment at Upland Sand Source.** The material shall be observed by the Contractor while the material is being loaded into the trucks for transport to the Construction Access/ Staging Area. Both the Contractor and the Permittee will have benchmark samples labeled with the permit number, "Benchmark Sample", date collected, site name and information on where the sample was attained. The benchmark sample shall be material that has been deemed beach compatible in accordance with the Sediment Compliance Specifications in Table 1 and shall serve as the minimum requirement for the material being placed on the beach. If any material appears to be non-compliant, it shall be set aside for testing and/or further processing and not transported to the beach.

a. **For conventional hydraulic excavation and stockpiling.** The Contractor will collect a sediment sample at frequency not less than 1 sample for each 3,000 cubic yards of stockpiled material no less than 6-inches below the surface to visually assess grain size, silt content, gravel content, Munsell color, shell content, and silt content against the benchmark sample. The sample shall be a minimum of 1 U.S. pint (approximately 200 grams). Each sample shall be archived with the date, time and location of the sample. This assessment will consist of handling the fill material to ensure that it is predominantly sand and to evaluate if the physical characteristics of the material meets the Sediment Compliance Specifications in Table 1. If deemed that the material may not be in compliance, the sample shall be tested at a Licensed Testing Laboratory using the criteria outlined in Section D.7.b. Sediment testing results shall be provided to the Permittee and Engineer prior to any portion of the 3,000 cubic yards of material represented by that sample being transported to the Construction Access/Staging Area. Sediment testing

results shall reference a specific stockpile name and GPS location within the mine. The results of 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 for at least 120 days after project completion and shall be made available to the Permittee upon request.

b. **For material requiring special handling and material processing.** If special handling and material processing are necessary to produce beach compatible material consistent with the Sediment Compliance Specifications in Table 1, then sampling and laboratory testing of the processed sand shall be conducted at the upland mine(s) from the stockpiled material before the material is transported to the Construction Access/Staging Areas. The Contractor will collect not less than 1 representative sample from every 3,000 cubic yards of material in the stockpile no less than 6 inches below the surface from the middle of the stockpile. The sample shall be a minimum of 1 U.S. pint (approximately 200 grams). Each sample will be archived with the stockpile name, date, time and GPS location of the sample. The samples shall be tested at a Licensed Testing Laboratory using the criteria outlined in Section D.7.b. Sediment testing results shall be provided to the Permittee and Engineer prior to any portion of the 3,000 cubic yards of material represented by that sample being transported to the Construction Access/Staging Area. The laboratory testing results will be appended to or notated on the Contractor's Daily Report. All samples will be stored for at least 120 days after project completion and shall be made available to the Permittee upon request.

If a sample does not meet the Sediment Compliance Specifications in Table 1, then the 3,000 cubic yards of material represented by that sample shall not be transported to the Construction Access/Staging Area. The material may undergo further processing to meet the Sediment Compliance Specifications with additional laboratory testing to verify the additional processing produce material that meets the Sediment Compliance Specifications, or the material shall be set aside and not used.

2. **Beach Observation**. The Contractor will continuously visually monitor the sediment being placed on the beach to assess grain size, silt content, gravel content, and Munsell color. This assessment will consist of handling the fill material to ensure that it is predominantly sand and to note the physical characteristics, and assure the material meets the Sediment Compliance Specifications in Table 1. If deemed necessary, quantitative assessments of the sand will be conducted for grain size, silt content, gravel content and Munsell color using the methods outlined in section D.7.b. If noncompliant sediment is placed on the beach, the Contractor will immediately cease placement until any stockpiled material at the beach construction staging area can be verified as beach compatible. The Contractor will notify the Permittee, providing the time, location, and description of the noncompliant sediment. The noncompliant sediment will be subject to remediation, as described in Section E. The Contractor will take the appropriate actions to remediate the noncompliant material to achieve and document compliance with the Sediment Compliance Specifications. The Contractor, in cooperation with the Permittee or Engineer, will utilize the sampling records at the upland source(s) to determine where the material originated from to avoid additional placement of noncompliant sediment.

D. QUALITY ASSURANCE PLAN

The Permittee will seek to 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 and Sampling for Visual Assessment.** Construction observation by the Permittee's On-Site Representative will be performed on a daily basis during periods of active construction. The Permittee's On-Site Representative will collect a sediment sample to visually assess grain size, silt content, gravel content, Munsell color, The observation will include handling the fill material to ensure that it is predominantly sand and to evaluate if the physical characteristics of the material meets the Sediment Compliance Specifications in Table 1. If the Permittee or Engineer determines that the beach fill material does not comply with the Sediment Compliance Specifications, the Permittee or Engineer will immediately instruct the Contractor to cease placement and take the necessary actions to avoid further placement of noncompliant sediment. 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 D.7.b. If noncompliant sediment is placed on the beach, the Permittee or Engineer will document the time, location, and descritption of the noncompliant sediemtn. The noncompliant sediment will be subject to remediation, as

described in Section E. The Permittee or Engineer, in cooperation with the Contractor, will utilize the sample records at the upland source(s) to determine where the material originated from to avoid additional placement of noncompliant sediment.

2. **On-Site Representative.** The Permittee will provide on-site observation by individuals with training or experience in beach nourishment and construction inspection and testing, and who are knowledgeable of the project design and permit conditions. The Engineer will actively coordinate with the Permittee's On-Site Representative, who may be an employee or sub-contractor of the Permittee or the Engineer. Communications will take place between the Engineer and the Permittee's On-Site Representative on a daily basis during periods of active construction.

3. **Pre-Construction Meeting.** The project QC/QA Plan will be discussed as a matter of importance at the pre-construction meeting. The Contractor will be required to acknowledge the goals and intent of the above described QC/QA Plan, in writing, prior to commencement of construction.

4. **Contractor's Daily Reports.** The Permittee's On-Site Representative or Engineer will review the Contractor's Daily Reports which will characterize the nature of the sediments encountered at the upland sand source and placed along the project shoreline with specific reference to sand color and the occurrence of rock, rubble, gravel, silt or debris.

5. **On Call.** The Engineer 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. **Addendums.** Any addendum or change order to the Contract between the Permittee and the Contractor will be evaluated to determine whether or not the change in scope will potentially affect the QC/QA Plan.

7. **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 Engineer or Permittee's On-site Representative will conduct assessments of the sediment as follows:

a. Post-construction sampling 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 sections of constructed beach, two (2) duplicate sand samples will be collected at each FDEP Reference Monument profile line to assess the grain size, silt content, gravel content, and Munsell color, for compliance. The collected sediment samples shall be a minimum of 1 U.S. pint (at least 200 grams) each and obtained from the bottom of a test hole a minimum of 12 inches deep within the limits of the constructed berm. If the constructed section was filled only at the dune, then the sediment sample will be obtained from the dune. The samples will be visually assessed for grain size, silt content, gravel content, and Munsell color. The observation will include handling the fill material to ensure that it is predominantly sand, and to further note the physical characteristics. The existence of any layering or rocks within the test hole will be noted. One sample will be sent for testing at a Licensed Testing Laboratory while the other sample will be archived by the Permittee for 120 days after the project completion. All samples and laboratory test results will be labeled with the Project name, FDEP Reference profile line, date sample was obtained, and "Construction Fill Sample."

b. All Samples collected for laboratory testing will be evaluated for visual attributes (Munsell color), 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", 7/16", 5/16", 3.5, 4, 5, 7, 10, 14, 18, 25, 35, 45, 60, 80, 120, 170, 200 and 230.

c. Laboratory testing results will include a cumulative grain size distribution table and curve for each sample tested. 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. registered in the State of Florida. 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. The Permittee will submit sediment testing results and analysis report to the Department within 90 days following beach construction.

d. In the event that a section of beach contains fill material that is not in compliance with the Sediment Compliance Specifications, then the Department will be notified. Notification will indicate the volume, aerial extent and location of any unacceptable beach areas and remediation planned.

E. REMEDIATION

1. **Compliance Area.** If a sample does not meet the compliance requirement to not contain coarse gravel or rocks, construction debris, toxic material, or other foreign matter, the Permittee shall determine the aerial extent of the noncompliant beach fill material and remediate regardless of the extent of the noncompliant material. If a sample is noncompliant for the grain size, silt content, gravel content, or Munsell color, and the aerial extent exceeds 10,000 square feet of beach berm or 100 linear feet of dune for dune-only projects, the Permittee shall remediate.

2. **Notification.** If an area of newly constructed beach or dune does not meet the Sediment Compliance Specifications, then the Department (JCPCompliance@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, the Permittee 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 berm or 100 linear feet of dune for dune-only projects is noncompliant, the following procedure will be performed by the Permittee's On-site Representative or Engineer:

a. Upon determination that the first sediment sample is noncompliant, at minimum, five (5) additional sediment samples will be collected at a maximum 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 assessed to evaluate compliance with the Sediment Compliance Specifications If deemed necessary by the Engineer, quantitative assessments of the sand will be conducted for grain size, silt content, gravel content, and Munsell color using the methods outlined in Section D.7.b. Samples will be archived by the Permittee.
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.** The Permittee or Project Permittee's Engineer 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 the Permittee or Engineer 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. Mean gran size: blending the noncompliant fill material with compliant fill material within the adjacent construction berm or dune sufficiently to meet the compliance value, or removing the noncompliant fill material and replacing it with compliant fill material.
b. Silt content: blending the noncompliant fill material with compliant fill material within the adjacent construction berm or dune sufficiently to meet the compliance value, or removing the noncompliant fill material and replacing it with compliant fill material.
c. Gravel content: blending the noncompliant fill material with compliant fill material within the adjacent construction berm or dune sufficiently to meet the compliance value or removing the noncompliant fill material and replacing it with compliant fill material.

d. Munsell color: blending the noncompliant fill material with compliant fill material within the adjacent construction berm or dune sufficiently to meet the compliance value or removing the noncompliant fill material and replacing it with compliant fill material.
e. Coarse gravel or rocks: screening and removing the noncompliant fill material and replacing it with compliant fill material.
f. 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 upland disposal facility located landward of the Coastal Construction Control Line or returned to the upland mine.

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 assessed to evaluate compliance with the Sediment Compliance Specifications. If deemed necessary by the Engineer, quantitative assessments of the sand will be conducted for grain size, silt content, gravel content, and Munsell color using the methods outlined in Section D.7.b. Samples will be archived by the Permittee.

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 7 days following completion of remediation activities.

All reports or notices relating to this permit shall be emailed or sent to:
FDEP Division of Water Resource Management
JCP Compliance Officer
Mail Station 3544
2600 Blair Stone Road
Tallahassee, Florida 32399
phone: (850) 414-7716
e-mail: JCP Compliance@dep.state.fl.us

End of Plan

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