

Physical Monitoring Plan
Duval County Beach and Dune Renourishment

FDEP Permit No. 0228528-005-JC
Permittee: City of Jacksonville

March 23, 2015

Topographic and bathymetric profile surveys of the beach and offshore shall be conducted prior to commencement of construction, immediately following completion of construction, and biennially thereafter beginning one or two years following completion of construction. A pre-construction survey of the project area to receive beach fill may use surveys conducted for purposes of construction bidding, contracting or construction management. The post-construction survey shall consist of a single beach-offshore profile survey event of the project monitoring area conducted within 60 days after completion of beach fill placement.

Thereafter, monitoring surveys shall be conducted biennially beginning approximately one year following completion of construction until the next beach nourishment event or the expiration of the project design life, whichever occurs first. The monitoring surveys shall be conducted during a spring or summer month and repeated as close as practicable during that same month of the year. If the time period between the post-construction survey and the first biennial monitoring survey is less than six months, then the Permittee may at their discretion postpone the first monitoring survey until the following spring/summer.

The monitoring area shall include profile surveys at each of the Department of Environmental Protection's DNR reference monuments within the bounds of the beach fill area and along at least 5,000 feet of the adjacent shoreline on both sides of the beach fill area. All work activities and deliverables for the biennial monitoring surveys shall be conducted in accordance with the latest update of the Department's *Monitoring Standards for Beach Erosion Control Projects, Sections 01000 and 01100*.

Bathymetric surveys of the borrow area(s) shall be conducted within 90 days prior to and 60 days following completion of construction of the project concurrently with the beach and offshore surveys required above. Alternatively, the pre-construction survey of the borrow area may consist of survey data collected prior to construction for purposes of planning and design; and the post-construction surveys of the borrow area may consist of surveys and other information collected during construction for purposes of construction management.

Survey grid lines across the borrow area(s) shall be spaced to provide sufficient detail for accurate volumetric calculations but spaced not more than a maximum of 500

feet apart, and shall extend a minimum of 500 feet beyond the boundaries of the borrow site. In all other aspects, work activities and deliverables shall be consistent with the Department's *Monitoring Standards for Beach Erosion Control Projects, Section 01200*.

The Permittee shall submit an engineering report and the monitoring data to the BBCS within 90 days following completion of the construction and each biennial monitoring survey.

The report shall summarize and discuss the data, the performance of the beach fill project, and identify erosion and accretion patterns within the monitored area. Results shall be analyzed for patterns, trends, or changes between annual surveys and cumulatively since project construction. In addition, the report shall include a comparative review of project performance to performance expectations and identification of adverse effects attributable to the project. The report shall specifically include:

- A record of the volume and location of all beach fill or inlet sand bypassing material placed within the project area;
- The volume and percentage of advance nourishment lost since the last beach nourishment project as measured landward of the MHW line of the most recent survey;
- The most recent MHW shoreline positions (ft) in comparison with the design profile at each individual monument location;
- The MHW shoreline position changes (ft) relative to the pre-construction survey at each individual monument location for pertinent monitoring periods, including post-construction, prior and most recent surveys;
- The total measured remaining volume (cy) in comparison with the total predicted remaining volume and/or placed volume (cy) above the MHW line and above the Depth of Closure for the entire project area over the successive monitoring periods; and,
- Other shoreline position and volumetric analysis the Permittee or engineer deem useful in assessing, with quantitative measurements, the performance of the project.

The report shall include computations, tables and graphic illustrations of volumetric and shoreline position changes for the monitoring area. An appendix shall include superimposed plots of the two most recent beach profile surveys, the design profile, and pre- and post-construction beach profile at each individual monument location. The post-construction report of the borrow area shall include planform maps identifying the change in seabed elevation relative to the pre-construction survey and conformance with permitted dredge elevations, and calculation of volume change. The pre-construction survey of the borrow area shall be used to indicate those areas of the seabed that were below the permitted dredge elevation prior to construction.

A digital copy of the monitoring report and a digital file of the survey data shall be submitted to the Division of Water Resource Management in Tallahassee. Failure to

submit reports and data in a timely manner may constitute grounds for revocation of the permit. When submitting any monitoring information to the Bureau, please include a transmittal cover letter clearly labeled with the following at the top of each page: **"This monitoring information is submitted in accordance with the approved Monitoring Plan for Permit No. 0228528-005-JC for the monitoring period [XX]."**