

**Attachment No. 37**  
**Physical Monitoring Plan**

**Physical Monitoring Plan  
of the Collier County Beach Renourishment Project  
FDEP Permit No. 0222355-001-JC and 0222355-12-JN  
March 2005  
Revised January 2013**

Physical monitoring of the Collier County Beach Renourishment Project requires the acquisition of project-specific data to include, at a minimum, topographic/bathymetric surveys of the beach, offshore, and borrow site areas and aerial photography. The monitoring data is necessary in order for both the project sponsor(s) and the Department to regularly observe and assess, with quantitative measurements, the performance of the project, any adverse effects which have occurred (e.g. to adjacent shorelines), and the need for any adjustments, modifications, or mitigative response to the project. The scientific monitoring process also provides the project sponsor(s) and the Department information necessary to plan, design, and optimize subsequent follow-up projects, potentially reducing the need for and costs of unnecessary work, as well as potentially reducing any environmental impacts that may have occurred or be expected.

This plan is a detailed Monitoring Plan required by FDEP Permit No. 0222355-001-JC dated January 12, 2005 and the pending permit 0222355-12-JN. The project's predicted design life is 6 years. Specific requirements are as follows:

- a. Topographic and bathymetric profile surveys of the beach and offshore shall be conducted within 90 days prior to commencement of construction, and within 60 days following completion of construction of the project. Thereafter, monitoring surveys shall be conducted annually for a period of three (3) years, then biennially 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 immediate post-construction survey and the first annual monitoring survey is less than six months, then Collier County may request a postponement of the first monitoring survey until the following spring/summer. If the monitoring survey falls within 6 months of construction, it may substitute for the pre-construction survey.

The monitoring area shall include profile surveys at each of the Department of Environmental Protection's reference monuments within the bounds of the beach fill area and along up to 5,000 feet on the adjacent shoreline on both sides of the beach fill area. For this project, this will include DEP reference monuments in Collier County from R-17 to R-84 inclusive as shown on the attached figure. An intermediate profile is established south of Doctors Pass, and labeled R-58A. Profile surveys shall extend landward to the seawalls or 50 feet landward of the 5.0' contour line. Profile surveys will extend seaward to the -13' NGVD contour or 2,000 feet from the shoreline, whichever is the greater distance. All work activities and deliverables shall be conducted in accordance with the March 2004 Bureau of Beaches and Coastal Systems (BBCS) *Monitoring Standards for Beach Erosion Control Projects, Sections 01000 - Beach Profile Topographic Surveying for Beach Erosion Control Projects and 01100 - Offshore Profile Surveying for Beach Erosion Control Projects.*

b. Bathymetric surveys of the borrow area are not required. Borrow Area T1 is located approximately thirty-three (33) miles to the northwest and offshore of the placement area, outside of State waters, and is not covered under the State permit requirements. No post-construction survey of Borrow Area T1 is planned, other than the survey performed by the dredger.

c. Aerial photography of the beach shall be taken concurrently with the post-construction survey and each annual and biennial monitoring survey required above, as close to the date of the beach profile surveys as possible, and during approximate low water tide on that date. The limits of the photography shall include the surveyed monitoring area as described in Part (a) above and 500 feet of the adjacent waterways north of the project area. The photography may come from available third parties efforts, such as from the County Property Appraiser and shall be color vertical photos with a 30% forward overlap, taken from an elevation of 3,000 feet (1:6000 negative scale) and centered on the local shoreline. A digital scan of the color photos at a rate of 21 microns with a pixel size of 0.4 feet shall be made and submitted in TIF format (uncompressed) on CD or DVD. Equivalent digital photography is an acceptable substitute. All work activities and deliverables shall be conducted in accordance with the March 2004 BBCS *Monitoring Standards for Beach Erosion Control Projects, Section 02100 - Environmental Aerial Photography Acquisition for Beach Erosion Control Projects.*

Collier County shall make every effort to coordinate the timing of flights with favorable conditions, but shall not be held responsible should consistently poor weather or rough seas occur during the months that the aerials are required.

d. Collier County will submit an engineering report and the monitoring data to the FDEP within 90 days following completion of the each annual or biennial monitoring survey. The survey data and control information should be submitted on electronic media such as floppy disk, or CD-ROM, in an ASCII format stored as specified in the March 2004 BBCS *Monitoring Standards for Beach Erosion Control Projects, Sections 01000 - Beach Profile Topographic Surveying for Beach Erosion Control Projects and 01100 - Offshore Profile Surveying for Beach Erosion Control Projects.*

The report will summarize and discuss the data, the performance of the beach fill project, and identify erosion and accretion patterns within the monitored area. In addition, the report shall include a comparative review of project performance to performance expectations and identification of adverse impacts attributable to the project.

Appendices will include plots of survey profiles and graphical representations of volumetric and shoreline position changes for the monitoring area. Results should be analyzed for patterns, trends, or changes between annual surveys and cumulatively since project construction.

The approved Monitoring Plan can be revised at any later time by written request of Collier County and with the written approval of the Department. If the project is

constructed in separable reaches or if one or more reach is eliminated, the monitoring limits shall be modified.

e. Monitoring reports and data will be submitted to the FDEP, Division of Water Resources Management, JCP Compliance Officer, in Tallahassee. The report and individual submittals will be labeled at the top of each page: "This monitoring information is submitted in accordance the approved Monitoring Plan for Permit No. 0222355-001-JC for the monitoring period [XX]."

**Collier County Beach Renourishment Project  
Physical Monitoring Summary**

Monitoring Task	Pre-Project	Post-Project	1st Year	2nd Year	3rd Year	5th Year
Beach Profile Surveys <sup>1,2,3</sup> R-17 to R-84	X	X	X	X	X	X
Bathymetric Surveys <sup>2</sup> Borrow Area T1						
Aerial Photographs R-17 to R-84		X	X	X	X	X
Monitoring Report		X	X	X	X	X
Biological Monitoring (Separate Plan)	X	X	X	X	X	X

1. Surveys from R-17 to R-21 may be conducted as part of the Wiggins Pass Maintenance Dredging Project during years when surveys are required by both projects.
2. Borrow Area T1 resides in Federal Waters.
3. Intermediate profile R-58A included.

**Reference**

Bureau of Beaches and Coastal Systems (BBCS), *Monitoring Standards for Beach Erosion Control Projects*, March 2004.