CESAJ-EN-GG 31 May 2013

MEMORANDUM FOR RECORD

SUBJECT: Technical Review of the SE Florida Sediment Assessment and Needs Determination (SAND) Study.

1. The draft Southeast Florida Sediment Assessment and Needs Determination (SAND) study was completed in November 2012 and prepared by the Geology and Exploration Section (EN-GG), Geotechnical Branch, US Army Corps of Engineers, Jacksonville District (USACE). The SAND study's primary purpose was to update sediment needs (Needs Determination) and offshore sediment sand volumes for St. Lucie, Martin, Palm Beach, Broward and Miami-Dade Counties (Sediment Assessment) for a 50-year time frame from 2012 to 2062.

2. The Sediment Needs Determination Reports were completed by the County representatives and reviewed by the SAND Study team using Dr. Checks. The needs determinations were provided to Jacksonville District for inclusion in the final report.

3. Following completion of the draft SAND study, the Florida Department of Environmental Protection (FDEP) retained Coastal Planning and Engineering, Inc. (CPE) from Boca Raton, Florida to perform a technical review of both the Sediment Assessment and Needs Determination portions of the SAND study. Comments were supplied back to USACE in February 2013.

4. Following review of the SAND study, CPE provided a technical memorandum outlining their main concerns with the draft SAND study report:

   - FDEP Reconnaissance Offshore Sand Search (ROSS) and CPE documents were underutilized
   - Many portions of the report need to be further explained for clarity
   - The depleted, unusable, economically unfeasible category needed to be broken apart
   - Proven, Potential, and Unverified Category descriptions were vague and did not uniformly convey data quality/quantity variations
   - Hard bottom buffers were applied at 200-foot in the draft SAND Study report. CPE recommended using 400-foot hard bottom buffers.
   - Depth of closure considerations
   - 'Blockiness' of sand sources in the draft study needed to be addressed to better capture the bathymetric character of sediment deposits.
   - Re-evaluate borings for Munsell value, % retained on the #4 sieve, finest allowable mean grain size and remove the influence of borings that do not meet the SAND Study criteria.
   - Use seismic data in areas where available

5. Following technical review, the estimated volume of available sediment decreased by approximately 100 Mcy from the draft to the final report. This represents a 26% volume decrease in estimated sediment volumes. Volume reductions were the result of many factors. The two primary factors were the SAND Study Team's decision to change the assumptions regarding 200-foot or 400-foot hardbottom buffers and using the Depth of Closure (DoC) instead of the -18-foot contour as the shallowest dredging limit. Approximate volume losses are as follows:

   - Hardbottom buffers: -30 Mcy

- Depth of Closure: -20 Mcy
- Other items as listed below: -50 Mcy
    - Refining the lateral extents of the sediment deposits using bathymetry
    - Incorporating seismic and better constraining the sediment deposits cross-sectional geometries (adding a 4-foot thick sediment source edge to each thickness calculation)
    - Consensus between USACE, FDEP and CPE geologists regarding the category (Proven, Potential or Unverified) classification of sediment sources
    - Increasing the minimum acceptable mean grain size from 0.12 mm to 0.13 mm at the demarcation of fine and very fine sand according to the Udden-Wentworth grain-size classification system for sediments.
    - Re-evaluating Munsell color values and % retained on the #4 sieve for all borings in the study area.

6. The final Southeast Florida Sediment Assessment and Needs Determination (SAND) study concludes that with contingencies applied, 174,101,870 cubic yards of sediment are needed to support placement of planned, full-sized beach nourishment projects through 2062. With contingencies and confidence levels applied, it was found that 280,037,956 cubic yards exist offshore of Southeast Florida that meet the criteria for this study established for sand placement on Florida beaches. Therefore, currently known sediment resources for St. Lucie, Martin, Palm Beach, Broward and Miami–Dade Counties exceed sediment needs by 100,000,000 cubic yards. This volume estimate will increase as potential and unverified sediment sources identified in the study area are further developed.

7. Point of contact for further information is Jase Ousley, Jacksonville District, US Army Corps of Engineers, 904-232-1496, jase.d.ousley@usace.army.mil