UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
263 13th Avenue South
St. Petersburg, Florida 33701-5505
http://sero.nmfs.noaa.gov

F/SER47:JK/pw

(Sent via Electronic Mail)

Colonel Jason A. Kirk, Commander
U.S. Army Corps of Engineers, Jacksonville District
P.O. Box 4970
Jacksonville, Florida 32232-0019

SEP 11 2015

Attention: Eric Summa

Dear Colonel Kirk:

NOAA's National Marine Fisheries Service (NMFS) reviewed the report entitled, *Delineation of Potential Sedimentation Effect Area within Middle and Outer Reef Habitats, Port of Miami Phase III Federal Expansion Project*, dated August 2015 (Sediment Delineation Report) prepared by Dial Cordy and Associates, Inc. (DCA), and provided to the NMFS at a meeting with the Jacksonville District and DCA on August 24, 2015. The following comments are provided in response to the District's request for a technical review of the report and a request for the NMFS to identify parameters to include in the immediate post-construction monitoring report and the six-month and 12-month post-construction monitoring reports. These reports are critical for Essential Fish Habitat (EFH) and Endangered Species Act (ESA) consultations.

Comments on the Sediment Delineation Report

The report provides results of an assessment on the Middle and Outer Reefs not reflecting input from the NMFS on assessment design provided to the District in our letter dated February 11, 2015, and in NOAA (2015a), and which was limited in scope and effort (see Sediment Delineation Report Figure 1 and Table 2). Impacts may have occurred in hardbottom habitats west of the Middle Reef along the elbow region of the channel (DCA 2014c), and those impacts are not included in the Sediment Delineation Report. The methods section lacks the detail needed to replicate the field assessment and data analyses. The report focuses too strongly on scleractinian corals and the difficulty differentiating between sedimentation and disease impacts.

The NMFS recommended approach to assess sedimentation impacts would have been to assess the coral reef and hardbottom habitats for a visible distribution of continuous and patchy clay or mud-like sediments (as described in FDEP 2014; FDEP 2015; NMFS 2015a; NMFS 2015b) in combination with a community-level quantitative assessment examining scleractinian corals in addition to other essential components of a coral reef and hardbottom habitat, including octocorals and sponges, at an appropriate mix of high-relief and low-relief sites. The NMFS-recommended approach would examine and document notable signs of sediment stress including, but not limited to, partial and complete mortality of scleractinian corals; burial of erect forms of octocoral and sponge holdfasts; smothering of encrusting forms of sponges and octocorals; direct accumulation of mud-like material on sea fans (*Gorgonia ventalina*); absence

of attached macroalgae and presence of smothered turf algae assemblages; observations of detached octocorals and sponges with signs of necrosis at the attachment parts; and absence of recruits and smallest size classes of scleractinian corals, octocorals, and sponges, especially in low-relief areas.

Detailed comments are provided below and in an enclosure. While the NMFS is still reviewing the report and may relay additional comments, every effort has been made to include the more substantive comments in this letter.

- In several places within the report, DCA articulates that because there is no pre-construction or during-construction data from interstitial sites, which DCA defines to be between the channel-side and control sites[1], it is impossible to partition project-related sedimentation from natural sedimentation. However, the patterns of sediment-related partial mortality clearly show (at least for the Middle Reef) a gradual diminution with distance from the channel as illustrated in Table 4 (page 53). This pattern is best explained by project-related sedimentation. There is a diminishing proportion of colonies with sediment-related partial mortality from channel-side to the interstitial "temporary" sites (e.g., the 550 meter and 850 meter sites in R2N) to the control sites as illustrated in Table 4 (page 53).
- The NMFS acknowledges the severe magnitude and extent of the coral disease outbreak in southeast Florida. However, in portions of the Executive Summary, Results, and the presentation delivered by DCA on August 24, 2015, NMFS believes coral disease is overemphasized as the singular cause of coral impacts. For example, the fifth paragraph of the Executive Summary presents the relative effects of sedimentation only in terms of total colony mortality as 1.2 percent of colonies; whereas partial (23.5 percent) and full mortality (18.5 percent) from disease is presented. This summary fails to acknowledge that up to 94 percent of colonies have sediment-related partial mortality at some sites (compared to seven percent at the related control site; Table 4). In this way, the report seems to selectively choose certain results to downplay the permanent effects of sedimentation to the area corals.
- The NMFS requests clarification of the sixth paragraph in the Executive Summary. It seems to say quantification of low-relief versus high-relief habitat is needed to determine coral impact ("The number of corals affected is unknown at this time because low-lying habitat information has not been quantified . . ."). The samples seemed to cover both low-relief and high-relief portions of habitat without bias; therefore, the NMFS requests DCA explain if the proportion of sampled colonies reflects the proportion of the population affected at each site/habitat type.
- Both the Conclusions and Recommendations sections state, "The potentially impacted area is variable in time and space, as currents, wind, waves as well as material characteristics influenced the distribution of material during dredging activities." While the latter clause is accurate in describing potentially variable *exposure* to sedimentation stress, the area of *impact* is defined by the cumulative actual effects or responses of organisms and is thus not variable in time and space.
- Appendix D describes levels of sedimentation stress measured in DCA's April-May 2015 sampling as "low across all Middle and Outer Reef sites.... The low levels of partial

[1] *Reference sites* and *control sites* are used interchangeably in DCA (2015).

burial and burial by sediment indicate that sediment stress conditions have abated." This does not correlate with the information presented in Table 3 of Appendix D, which shows over 50 percent of colonies with sediment accumulation at some sites (compared to ten to 17 percent of control site colonies) and up to 30 percent of colonies with partial burial (zero percent at control sites). The NMFS also requests clarification of the term "abated." Use of this term suggests these levels were even higher during construction. In addition, complete and partial colony mortality that has already occurred has not and will not 'abate.' Further, the statement suggests there will be no additional stress or morality from the observed levels of "partial burial and [total] burial."

- The report notes video was captured during the surveys but has not yet been analyzed beyond what is presented in Appendix C. Similarly, the presentation DCA delivered to the NMFS on August 24, 2015, included photos of marked corals taken over time, providing a time-lapse view of some colonies. What is the timeline for analyzing this video footage and photos and providing a report of that analysis? The photo analysis could be helpful in differentiating sediment impacts from disease-related impacts.
- The report identifies an approximate area of 213 acres of potential impact along the Middle and Outer Reefs based on Walker (2009) habitat maps, while noting the 213 acres includes sand and non-hardbottom habitats in addition to coral reef. What is the timeline for separating out the actual coral and hardbottom habitat areas from the sand and other habitat areas within the 213 acre area? Related to this, during the meeting on August 24, 2015, the Jacksonville District described plans to perform a hydrographic survey to obtain a more refined habitat map of the area (i.e., finer scale than the one-acre minimum mapping unit used in Walker (2009)). We are concerned the coral reef and hardbottom habitat burial from project-related sediments would appear as sand bottom habitat in any new mapping effort, including one using a smaller minimum mapping unit. The NMFS requests the District explain how this issue would be addressed in any future analysis.
- Appendix A mentions two dives conducted by NOAA on May 19, 2015, at compliance sites R2N1 and R2N2. While some observations described in Appendix A by the NOAA and DCA divers are consistent, several key differences are described below and more detail can be found in the field report (NMFS 2015b).

R2N1:

  - The NOAA divers recorded sediment to be one to five centimeters deep, with at least one centimeter of sediment covering all sloping or horizontal surfaces of the reef. DCA recorded sediment depth to be one-half to one centimeter deep.
  - The NOAA divers observed fine, white sediment with sand, silt, and clay-sized particles. This assessment was based on the sediments having a slippery texture similar to wetland muck soil. DCA recorded sediments as fine, white sand with no pockets of clay-like material.

R2N2:

- Sediment depth was recorded by DCA as one-half to one centimeter deep, while the NOAA divers observed one to five centimeters of sediment on the reef, with more than ten centimeters at the base of vertical portions of the reef.
- The NOAA divers observed greater vertical relief and microhabitat variability, with many different sized interstitial spaces in reef habitats compared to site R2N1, all of which had sediment deposits. Sand, silt, and clay-sized particles were observed in the sediment by the NOAA divers. Only sand is described by DCA.
- DCA describes octocorals and sponges as appearing "healthy and unaffected" by sedimentation at this site. Observations by the NOAA divers found the surfaces of sponges covered in sediment and sediment accumulations greater than five centimeters at the base of barrel sponges (*Xestospongia muta*). In addition, burial of sponge and octocorals holdfasts by fine white sediment was observed. The NMFS requests clarification from DCA if these observations would change the "healthy and unaffected" characterization.

Items to address in the immediate post-construction report and the six-month and 12-month post-construction reports

During the August 24, 2015, meeting, the District advised that data collection is complete for the immediate post-construction monitoring requirement and the District expects to deliver the report to the NMFS in October 2015. The District requested the NMFS identify information and analyses it would like to see in the immediate post-construction report, recognizing the request cannot require collection of additional data. The District also requested the NMFS provide recommendations to inform the methods and reporting requirements for the remaining post-construction reports. As regards to the remaining required post-construction monitoring reports, the District requested the NMFS review the methods sections of the two baseline survey events that occurred in 2010 and 2013 and resulted in the production of three reports referred to as DCA (2011), DCA (2014a), and DCA (2014b) and to recommend how these methods be used in the analyses within the six-month and 12-month post-construction reports.

The NMFS requests the monitoring approaches return to a community-based assessment versus a continued focus limited to scleractinian corals. It appears there are usable data available in the baseline reports on the broader coral reef community (e.g., octocoral and sponge size-class distribution data). DCA (2011) assesses Middle and Outer Reef habitats up to 400 meters north of the channel and 750 meters south of the channel. Based on review of the available pre-construction reports, NMFS has prepared a summary (enclosed) of data collection, approaches, and tables we need to see in the post-construction reports to determine the amount and severity of impacts that have occurred at the Port of Miami. General issues to address include:

- In order to complete the ESA consultation, NMFS needs to be able to clearly differentiate the areas which function as critical habitat for ESA-listed corals. While DCA (2014b) provides categories of functional group percent cover based on analyzed video, a category called "coralline/turf/bare (CTB)" is the predominant cover category, meanwhile "sand" shows up as a very small category. This is problematic as much of the turf clearly has sediment bound in it. NMFS requests DCA modify the categories of functional group percent cover in the immediate post-construction report and the six-

month and 12-month post-construction monitoring reports. If possible, the original pre-construction video should be re-analyzed as well as using the following categories. We believe it will be much more helpful to separate the CTB category into "crustose algae," "turf," and "sand/sediment" categories. We expect that the crustose algae category will be a very small amount of cover because it often has sediment covering. We believe turf is the dominant cover type. The NMFS requests DCA provide illustrations and precise definitions of what these categories look like on the video.

- The NMFS has concerns about the sites characterized in DCA (2014a) and DCA (2014b) serving as the true baseline conditions. For the immediate post-construction report, the NMFS requests the District produce a chronology of the dredging that has occurred (maintenance and expansion), location of the dredging, and the timing of the baseline surveys. Based on the information provided in DCA (2014b), it appears that all of the baseline survey events on the Outer Reef occurred after new-work dredging began.
- Regarding size class distribution of scleractinian corals, there are either discrepancies in the summary tables in DCA (2011) and DCA (2014b) or there was a shift in the size class distributions between the 2010 and 2013 field events (see Figure 19 in DCA (2011); Figures 13, 14, 15, and 16 in DCA (2014b)). Notably the figures in DCA (2014b) omit a size class of three to nine centimeters. Please provide an explanation of this, updated tables, and the supporting raw data in the immediate post-construction report.
- The NMFS requests the immediate post-construction report and the six-month and 12-month post-construction reports include the actual sampled densities and sizes for all species of corals listed as threatened under the ESA at each site. DCA (2011) only reports this for the four or five most abundant species and reports other species only as "present."

Closing

The NMFS appreciates the opportunity to provide these comments. Please direct related questions regarding the EFH provisions of the Magnuson-Stevens Fishery Conservation and Management Act to the attention of Ms. Jocelyn Karazsia at 561-249-1925 or by email at Jocelyn.Karazsia@noaa.gov. Please direct related questions regarding the ESA consultation to the attention of Ms. Kelly Logan at 727-460-9258 or by email at Kel.Logan@noaa.gov.

Sincerely,

Roy E. Crabtree, Ph.D.
For Regional Administrator

Enclosure: Summary of information needs for the immediate post-construction report and the six-month and 12-month post-construction monitoring reports

cc: FDEP, F. Aschauer, L. Edwards
F/SEC, B. Ponwith
F/SER3, D. Bernhart
F/SER4, V. Fay

Reports and Letters Cited:

DCA. 2011. Miami Harbor Baseline Study. Prepared by Dial Cordy and Associates Inc. for the U.S. Army Corps of Engineers Jacksonville District. 96pp.

DCA. 2014a. Miami Harbor Phase III Quantitative Baseline for Hardbottom Benthic Communities. Prepared by Dial Cordy and Associates Inc. for the U.S. Army Corps of Engineers Jacksonville District. 109pp.

DCA. 2014b. Miami Harbor Phase III Quantitative Baseline for Middle and Outer Reef Benthic Communities. Prepared by Dial Cordy and Associates Inc. for the U.S. Army Corps of Engineers Jacksonville District. 322pp.

DCA. 2014c. Monthly [October] Delineation of Potential Sedimentation Effect Area Within Nearshore Hardbottom. Prepared by Dial Cordy and Associates Inc. for Great Lakes Dredge and Dock Company, LLC. 16pp.

FDEP. 2014. Field notes on impacts assessment in Miami Harbor Phase III Federal Channel Expansion Permit #0305721-001-BI. Report date: August 18, 2014. 39pp.

FDEP. 2015. Report on site visit in Port of Miami Expansion Project. Report date: February 9, 2015. 24pp.

NMFS. 2015a. Port of Miami *Acropora cervicornis* relocation report. 15pp.

NMFS. 2015b. Port of Miami Field Observations from May 19, 2015. Prepared by NOAA National Marine Fisheries Service, Southeast Region. 19pp.

Walker, B. K. 2009. Benthic Habitat Mapping of Miami-Dade County: Visual Interpretation of LADS Bathymetry and Aerial Photography. FDEP report #RM069. Miami Beach, Florida. 47pp.

Enclosure: Summary of information needs for the immediate post-construction report and the six-month and 12-month post-construction monitoring reports

In the meeting with the Jacksonville District on August 24, 2015, the District requested the NMFS review the methods sections of the baseline survey events that occurred in 2010 and 2013 and resulted in the production of these reports (DCA 2011, DCA 2014a, 2014b). The NMFS was also requested to identify the parameters needed to be included in the immediate post-construction monitoring report and the six-month and 12-month post-construction monitoring reports.

For the immediate post-construction monitoring report, the NMFS requests:

- In order to complete the ESA consultation NMFS needs to be able to clearly differentiate the areas which function as critical habitat for ESA-listed corals. Therefore, we request modification of the categories of functional group percent cover in the immediate post-construction report and the six-month and 12-month post-construction monitoring reports. Specifically we request elimination of the "coralline/turf/bare (CTB)" category, and the addition of new categories (crustose algae, turf, and sand/sediment as summarized in the letter (page 4). Please provide illustrations and precise definitions of what these categories look like on the video. The NMFS requests having this re-categorization of functional groups in the immediate post-construction report and to have the pre-construction video re-done in a similar manner. This information is needed for differentiation of critical habitat elements.
- A chronology of what dredging (maintenance and new-work/expansion) was happening at the Port of Miami, where the dredging occurred, and when it occurred to better understand what sites represent a true baseline and what sites could have possibly been experiencing impacts from dredging.
- A summary table of the baseline data collection with a timeline of when dredging was occurring and when the sites were sampled for each of the four weeks and other data collection efforts.
- Further examination of whether the outer reef sites were undergoing project related-sediment stress during baseline data collection and an explanation of how baseline sediment samples collected up to three months after the expansion work was initiated could serve as a baseline.
- The mean proportion of stressed corals at each of the outer reef sites over the three weeks of baseline (i.e., replicate Table 20 in DCA 2014a for the Outer Reef).
- Pairwise comparisons of coral condition over the four weeks of baseline data.
- A week-by-week assessment of control vs. compliance sites. The 2014 report provides average proportion of corals exhibiting sedimentation stress. The averages include control sites.
- A time-series assessment of all tagged corals that includes all monitoring events and notes the date of each monitoring event.
- Clarification of the size classes of scleractinian corals sampled. There are either discrepancies in the summary tables in DCA (2011) and DCA (2014b) or there was a shift in the size class distributions between the 2010 and 2013 field events (see Figure 19 in DCA 2011; Figures 13, 14, 15, and 16 in DCA 2014b). Notably the figures in DCA (2014b) omit a size class of three to nine centimeters.

- Weekly sediment stress tables for each site sampled in the 2014 report that includes the dates the sites were sampled.
- A time series analysis of *Orbicella annularis* and *O. faveolata* colonies seen in both the 2010 and 2013 field events. *O. annularis* and/or *O. faveolata* colonies were documented in 2010 at R3S3-SG, R3S2-LR, R3N1-LR, and R3SC1-CP. In the 2014 report, *O. faveolata* was documented at R3S3-SG, R3S2-LR, and R3N1-LR, and *O. annularis* was documented at R3S3-SG and R3SC1-CP.

The NMFS requests the six-month and 12-month post-construction reports include summary tables of the items listed below. The NMFS also requests a similar table comparing the results of the 2011 baseline report (DCA 2011) to the six-and 12-month reports; and to apply to nearshore hardbottom, Middle Reef, and Outer Reef:

- Analysis of the archived 2011 video transect data for revised functional group cover. Repeat video transects during six-month and 12-month monitoring for comparison and analysis
- Scleractinian size class distribution
- Scleractinian condition data
- Scleractinian species richness
- Scleractinian coral density
- Shannon–Wiener Diversity Index (H') and Evenness (J') for scleractinian corals
- Octocoral size class distribution
- Octocoral generic richness, relative abundance, density
- Shannon–Wiener Diversity Index (H') and Evenness (J') for octocorals
- Number of sponge colonies, morphotype richness, density of colonies, and size class distribution
- Assessment of the coral reef and hardbottom habitats for a visible distribution of continuous and patchy clay or mud-like sediments (as described in FDEP 2014; FDEP 2015; NMFS 2015a; NMFS 2015b) in combination with a community-level quantitative assessment examining scleractinian corals in addition to other essential components of a coral reef and hardbottom habitat, including octocorals and sponges at an appropriate mix of high-relief and low-relief coral reef habitat sites. Examine and document notable signs of sediment stress including but not limited to:
    - Partial and complete mortality of scleractinian corals
    - Burial of erect forms of octocoral and sponge holdfasts
    - Smothering of encrusting forms of sponges and octocorals
    - Direct accumulation of mud-like material on sea fans (*Gorgonia ventalina*)
    - Absence of attached macroalgae and presence of smothered turf algae assemblages
    - Observations of detached octocorals and sponges with signs of necrosis at the attachment parts
    - Absence of recruits and smallest size classes of scleractinian corals, octocorals and sponges, especially in low-relief areas