Florida Department of Environmental Protection
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Tallahassee, Florida 32399-3000

Rick Scott
Governor

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Secretary

CONSOLIDATED ENVIRONMENTAL RESOURCE PERMIT AND SOVEREIGN SUBMERGED LANDS AUTHORIZATION

PERMITTEE:
U.S. Army Corps of Engineers
Attn: Eric Summa, Chief
Environmental Branch
Jacksonville District
P.O. Box 4970
Jacksonville, Florida 32232-0019

PERMIT INFORMATION:
Permit Number: 0305721-001-BI

Issuance Date: May 22, 2012

Expiration Date of Construction Phase:
May 22, 2017

Project Name: Miami Harbor Phase III Federal Channel Expansion

County: Miami-Dade

This permit is issued under the authority of Part IV of Chapter 373, F.S., and Titles 40 and 62, Florida Administrative Code (F.A.C.). The activity is not exempt from the requirement to obtain an environmental resource permit. Pursuant to Operating Agreements executed between the Department of Environmental Protection (Department) and the water management districts, as referenced in Chapter 62-113, F.A.C., the Department is responsible for reviewing and taking final agency action on this activity.

ACTIVITY DESCRIPTION:

The project is to widen and/or deepen several portions of the Miami Harbor channels and turning basins. New construction includes widening the easternmost portion of Cut 1 of the Entrance Channel from 500 to 800 feet, and deepening Cuts 1 and 2 of the channel from a project depth of -44 to -52 feet mean lower low water (MLLW) with 1 foot allowable overdredge, for a maximum allowable dredge depth of -53 feet MLLW; adding a turn widener at the southern intersection of Cut 3 with Fisherman's Channel and deepening to -50 feet MLLW with 1 foot allowable overdredge, for a maximum allowable dredge depth of -51 feet MLLW; increasing the Fisher Island Turning Basin from 1,200 to 1,500 feet, truncating the northeast section of the Turning Basin, and deepening from -42 feet to -50 feet MLLW with 1 foot allowable overdredge, for a maximum allowable dredge depth of -51 feet MLLW; expanding the Port's berthing area by 60 feet and widening the southern edge of Fisherman's Channel 40 feet, for a 100-foot increase in total width and deepening from -42 feet to -50 feet MLLW with one-foot allowable overdredge; and reducing the Middle Lummus Island Turning Basin from a 1,600

feet to 1,500 feet diameter and deepening from -42 feet MLLW to -50 feet MLLW with 1 foot allowable overdredge, for a maximum allowable dredge depth of -51 feet MLLW.

The project also includes maintenance dredging in the federal main channel (Cut 4), the main turning basin, and port berthing areas to -36 feet MLLW with 1 foot allowable overdredge, for a maximum allowable dredge depth of -37 feet MLLW; and the Dodge Island Cut, turning basin, and adjacent port berthing areas to -34 feet MLLW with one foot allowable overdredge, for a maximum allowable dredge depth of -35 feet MLLW. Approximately 600 days of confined blasting may be required for the deepening and widening; no blasting is required for maintenance dredging. The placement options for the dredged material include the Miami Ocean Dredged Material Disposal Site (ODMDS), the proposed seagrass mitigation site north of the Julia Tuttle Causeway and the proposed offshore artificial reef mitigation areas south of the Entrance Channel. As mitigation to offset impacts to 7.9 acres of seagrasses, a dredged hole will be filled and planted to restore at least 16.6 acres of seagrass habitat. Mitigation for direct impacts to 7.07 acres of hardbottom communities will include coral relocation and the construction of 9.28 acres of artificial reef.

ACTIVITY LOCATION:

The dredging activities are located within the federal channels and turning basins for the Port of Miami (Port), beginning in the Port and extending approximately 2.3 miles past Government Cut inlet in the Atlantic Ocean. The seagrass mitigation site is located on the north side of Julia Tuttle Causeway within the Biscayne Bay Aquatic Preserve (OFW). The hardbottom mitigation sites are located in the Atlantic Ocean, south of the Port's entrance channel, in the area between the second and third reefs. The Port and channels are located within the Biscayne Bay Aquatic Preserve, an OFW, which extends to Government Cut inlet. The channels themselves are subject to a navigational servitude. The areas of the Port located landward of Government Cut are in Sections 16, 37, 38, 39, Township 54 South, Range 42 East; and Section 19, Township 53 South, Range 42 East. All activities are in Class III waters.

The Department acknowledges that the deepening and maintenance dredging activities within the federal channel fall within one of the federal powers listed in the Submerged Lands Act under 43 U.S.C. 1311(d) or 43 U.S.C. 1314, and, under those provisions, needs no authorization from the Board of Trustees to utilize sovereignty submerged land within the limits of the designated federal navigation channels. However, under the provisions of the Coastal Zone Management Act (16 U.S.C. 1451-1465) this activity requires the State of Florida's concurrence with a determination of consistency with the sovereignty submerged lands provisions of Florida's approved Coastal Management Program prior to federal approval of the proposed activity. The State has determined that the dredging activity within the federal navigation channels is consistent with the sovereignty submerged lands provisions of Florida's approved Coastal Management program.

This permit constitutes a finding of consistency with Florida's Coastal Zone Management Program for the entire project, as required by Section 307 of the Coastal Zone Management Act.

Granting the associated variance to the antidegradation provisions in Rule 62-4.242(2)(a)2.b., F.A.C., authorizes the Permittee to exceed state water quality standards. Therefore, the Department hereby waives water quality certification pursuant to Section 401 of the Clean Water Act, 33 U.S.C. 1341.

The mitigation activities also requires a proprietary authorization, as those activities are located on sovereign submerged lands owned by the Board of Trustees of the Internal Improvement Trust Fund, pursuant to Article X, Section 11 of the Florida Constitution, and Sections 253.002 and 253.77, F.S. The activity is not exempt from the need to obtain a proprietary authorization. The Department has the responsibility to review and take final action on this request for proprietary authorization in accordance with Section 18-21.0051, and the Operating Agreements executed between the Department and the water management districts, as referenced in Chapter 62-113, F.A.C. In addition to the above, this proprietary authorization has been reviewed in accordance with Chapter 253 and Chapter 258, F.S., Chapter 18-18, Chapter 18-20, Chapter 18-21, and Rule 62-343.075, F.A.C., and the policies of the Board of Trustees.

As staff to the Board of Trustees, the Department has reviewed the mitigation activities described above, and has determined that the activity qualifies for consent to use sovereign submerged lands, as long as the work performed is located within the boundaries as described herein and is consistent with the terms and conditions herein. Therefore, consent is hereby granted to the project's local sponsor (Miami-Dade County), pursuant to Chapter 253.77, Florida Statutes to perform the activity on the specified sovereign submerged lands.

LOCAL SPONSOR AGREEMENT:

The Department will enter into a contractual agreement with the project's local sponsor, Miami-Dade County (County), under which the County, commencing 90 days after project completion, will also, along with the Permittee, be responsible for undertaking post-construction mitigation and resource monitoring and additional corrective mitigation (if necessary) as, and to the extent, required by the permit.

The above named Permittee is hereby authorized to construct the work outlined in the above Activity Description, the approved permit drawings, and other approved documents attached hereto or on file with the Department and made a part hereof. **This permit and authorization to use sovereign submerged lands is subject to the limits, conditions, and locations of work shown in the attached drawings, and is also subject to the attached General and Specific Conditions, which are a binding part of this permit and authorization.** You are advised to read and understand these drawings and conditions prior to commencing the authorized activities, and to ensure the work is conducted in conformance with all the terms, conditions, and drawings. If you are utilizing a contractor, the contractor also should read and understand these drawings and conditions prior to commencing the authorized activities. Failure to comply with all drawings and conditions shall constitute grounds for revocation of the permit and appropriate enforcement action.

Abbreviations used in the general and specific permit conditions below include:

BBCS: Bureau of Beaches and Coastal Systems (DEP)
BMP: Best Management Practice
Corps: U.S. Army Corps of Engineers
DEP or Department: Florida Department of Environmental Protection
PERA: Miami-Dade Permitting Environment, and Regulatory Affairs
EPA: U.S. Environmental Protection Agency
FWC: Florida Fish and Wildlife Conservation Commission
FWS: U.S. Fish and Wildlife Service
F.A.C.: Florida Administrative Code
F.S.: Florida Statutes
NMFS: National Marine Fisheries Service
NTU: Nephelometric Turbidity Unit
ODMDS: Ocean Dredged Material Disposal Site
SC: Specific Condition
U.S.C.: Unites States Code

GENERAL CONDITIONS:

1. This permit, including its general and specific conditions, must be construed in light of the February 28, 2006 Interagency Coordination Agreement for Civil Works Projects (ICA) between the Department and the Corps. As recognized in the ICA, the Department has the authority to include reasonable conditions in this permit. All of the conditions in this permit, both general and specific, are enforceable to the extent sovereign immunity has been waived under 33 U.S.C. §§ 1323 and 1344(t). The ICA is incorporated herein by reference.

2. All activities approved shall be implemented as set forth in the drawings incorporated by reference and in compliance with the conditions and requirements of this document. The Corps shall notify the Department in writing of any anticipated changes in:

   a) operational plans;
   b) project dimensions, size or location;
   c) ability to adhere to permit conditions;
   d) project description included in the permit;
   e) monitoring plans.

   If the Department determines that a modification to the permit is required then the Corps shall apply for and obtain the modification. Department approval of the modification shall be obtained prior to implementing the change, unless the change is determined by the

Department to reduce the scope of work from that authorized under the original permit, and will not effect compliance with permit conditions or monitoring requirements.

3. If, for any reason, the Corps does not comply with any condition or limitation specified herein, the Corps shall immediately provide the Department with a written report containing the following information:

   a) a description of and cause of noncompliance;
   b) the period of noncompliance, including dates and times;
   c) impacts resulting or likely to result from the non-compliance;
   d) steps being taken to correct the non-compliance; and
   e) the steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance.

   Compliance with the provisions of this condition shall not preclude the Department from taking any enforcement action allowed under state law with respect to any non-compliance.

4. The Corps shall obtain any applicable licenses, permits, or other authorizations which may be required by federal, state, local or special district laws and regulations. Nothing herein constitutes a waiver or approval of other Department permits or authorizations that may be required for other aspects of the total project.

5. Nothing herein conveys to the Corps or creates in the Corps any property right, any interest in real property, any title to land or water, constitutes State recognition or acknowledgment of title, or constitutes authority for the use of Florida's sovereign submerged lands seaward of the mean high-water line or an established erosion control line, unless herein provided, and the necessary title, lease, easement, or other form of consent authorizing the proposed use has been obtained from the State.

6. Any delineation of the extent of a wetland or other surface water submitted as part of the application, including plans or other supporting documentation, shall not be considered specifically approved unless a specific condition of this authorization or a formal determination under section 373.421(2), F.S., provides otherwise.

7. Nothing herein authorizes any entrance upon or activities on property which is not owned or controlled by the Corps or local sponsor, or conveys any vested rights or any exclusive privileges.

8. This document or a copy thereof, complete with all conditions, attachments, modifications, and time extensions shall be kept at the work site of the authorized activity. The Corps shall require the contractor to review this document prior to commencement of the authorized activity.

9. The Corps specifically agrees to allow Department personnel with proper identification, at reasonable times and in compliance with Corps specified safety standards access to the premises where the authorized activity is located or conducted for the purpose of ascertaining compliance with the terms of this document and with the rules of the Department and to have access to and copy any records that must be kept; to inspect the facility, equipment, practices, or operations regulated or required; and to sample or monitor any substances or parameters at any location reasonably necessary to assure compliance. Reasonable time may depend on the nature of the concern being investigated.

10. At least forty-eight (48) hours prior to the commencement of the authorized activity, the Corps shall submit to the Department a written notice of commencement of activities indicating the anticipated start date and the anticipated completion date.

11. If historic or archaeological artifacts such as, but not limited to, Indian canoes, arrow heads, pottery or physical remains, are discovered at any time on the project site, the Corps shall immediately stop all activities in the immediate area which disturb the soil and notify the Department and the State Historic Preservation Officer. In the event that unmarked human remains are encountered during permitted activities, all work shall stop in the immediate area and the proper authorities notified in accordance with Section 872.05, *Florida Statutes.*

12. Within a reasonable time after completion of construction activities authorized by this permit, the Corps shall submit to the Department a written statement of completion. This statement shall notify the Department that the work has been completed as authorized and shall include a description of the actual work completed. The Department shall be provided, if requested, a copy of any as-built drawings required of the contractor or survey performed by the Corps.

GENERAL CONSENT CONDITIONS FOR SOVEREIGNTY SUBMERGED LANDS AUTHORIZATION:

Any use of sovereignty submerged lands is subject to the following general conditions, which are binding upon the Permittee and are enforceable under Chapter 253, F.S. and, as applicable, Chapter 258, F.S.:

1. Sovereignty submerged lands may be used only for the specified activity or use. Any unauthorized deviation from the specified activity or use and the conditions for undertaking that activity or use will constitute a violation. Violation of the authorization will result in suspension or revocation of the Permittee's use of the sovereignty submerged lands unless cured to the satisfaction of the Board of Trustees.

2. Authorization under Rule 18-21.005, Florida Administrative Code (F.A.C.), conveys no title to sovereignty submerged lands or water column, nor does it constitute recognition

or acknowledgment of any other person's title to such land or water.

3. Authorizations under Rule 18-21.005, F.A.C., may be modified, suspended or revoked in accordance with its terms or the remedies provided in Sections 253.04, F.S. and Chapter 18-14, F.A.C.

4. Structures or activities will be constructed and used to avoid or minimize adverse impacts to resources.

5. Construction, use, or operation of the structure or activity will not adversely affect any species which is endangered, threatened or of special concern, as listed in Rules 68A-27.003, 68A-27.004, and 68A-27.005, F.A.C.

6. Structures or activities will not unreasonably interfere with riparian rights. When a court of competent jurisdiction determines that riparian rights have been unlawfully affected, the structure or activity will be modified in accordance with the court's decision.

7. Structures or activities will not create a navigational hazard.

8. Structures will be maintained in a functional condition and will be repaired or removed if they become dilapidated to such an extent that they are no longer functional.

9. Structures or activities will be constructed, operated, and maintained solely for water dependent purposes.

10. The Permittee agrees to indemnify, defend and hold harmless the Board of Trustees and the State of Florida from all claims, actions, lawsuits and demands in any form arising out of the authorization to use sovereignty submerged lands or the Permittee's use and construction of structures on sovereignty submerged lands. This duty to indemnify and hold harmless will include any and all liabilities that are associated with the structure or activity including special assessments or taxes that are now or in the future assessed against the structure or activity during the period of the authorization.

11. Failure by the Board of Trustees to enforce any violation of a provision of the authorization or waiver by the Board of Trustees of any provision of the authorization will not invalidate the provision not enforced or waived, nor will the failure to enforce or a waiver prevent the Board of Trustees from enforcing the unenforced or waived provision in the event of a violation of that provision.

12. The Permittee binds itself and its successors and assigns to abide by the provisions and conditions set forth in the authorization. If the Permittee or its successors or assigns fails or refuses to comply with the provisions and conditions of the authorization, the authorization may be terminated by the Board of Trustees after written notice to the

Permittee or its successors or assigns. Upon receipt of such notice, the Permittee or its successors or assigns will have thirty (30) days in which to correct the violations. Failure to correct the violations within this period will result in the automatic revocation of this authorization.

13. All costs incurred by the Board of Trustees in enforcing the terms and conditions of the authorization will be paid by the Permittee. Any notice required by law will be made by certified mail at the address shown on page one of the authorization. The Permittee will notify the Board of Trustees in writing of any change of address at least ten days before the change becomes effective.

14. This authorization does not allow any activity prohibited in a conservation easement or restrictive covenant that prohibits the activity.

SPECIFIC CONDITIONS:

1. This permit shall be incorporated by reference in any and all construction contracts.

2. Failure to report any noncompliance of any condition or limitation contained within this permit is itself a violation of this permit.

3. Compliance with this permit shall not be deemed complete until the Department determines construction has been conducted consistent with the terms of this permit.

4. If the General Conditions, or approved permit drawings contradict the Specific Conditions, then the Permittee shall be responsible for adhering to the Specific Conditions. Otherwise, the approved permit drawings shall be adhered to.

5. All submittals required herein shall be directed to both the Department's Bureau of Beaches & Coastal Systems office and the Southeast District office (cover letter only) at the following addresses:

Florida Dept. of Environmental Protection
Bureau of Beaches and Coastal Systems
Attn: JCP Compliance Officer
3900 Commonwealth Boulevard,
Mail Station 300
Tallahassee, Florida 32399-3000
Phone: 850-414-7716
Email: JCPCompliance@dep.state.fl.us

Florida Dept. of Environmental Protection
Southeast District Office
400 N. Congress Ave.
Suite 200
West Palm Beach, Florida 33401
Phone: 561-681-6600
E-mail: Jennifer.K.Smith@dep.state.fl.us

Such submittals include, but are not limited to, notices, progress reports and monitoring reports. **All submittals shall clearly indicate the project name (Miami Harbor Phase III Federal Channel Expansion) and the permit number (0305721-001-BI), and,**

when possible, be made via email or other electronic delivery. Within a business day of receipt of information from the Permittee or contractor, the Department will make non-proprietary information available on a publicly accessible web site. The Permittee shall notify DEP of the approximate time frame, if any, available within the construction schedule to salvage biological material to be adversely impacted by this project.

6. No elevation of turbidity is authorized within the boundaries of the Biscayne Bay Aquatic Preserve, designated as Outstanding Florida Waters (OFW), unless and until the Department issues a Final Order for a Variance (File No. 0305721-002-BV) from Rule 62-4.244(5)(c), F.A.C., to establish a temporary mixing zone greater than 150 meters, and from Rule 62-4.242(2)(a)2.b., F.A.C., to establish a maximum allowable turbidity level above background within these OFW during project construction.

7. **Pre-Construction Meeting.** At least seven (7) days prior to commencement of the dredging or filling authorized by this permit, the Permittee shall review the conditions and monitoring requirements of this permit with all contractors, the Corps, the JCP Compliance Officer, the Southeast District Office, Biscayne Bay Aquatic Preserve, FWC, FWS, NMFS, PERA, and (if applicable) the Miami-Dade Water and Sewer Department. Once the JCP Compliance Officer has confirmed his/her availability, the Permittee shall provide written notification, at least 14 days in advance of the meeting, to each of these offices advising of the date, time, and location of the pre-construction conference:

Florida Dept. of Environmental Protection
Bureau of Beaches and Coastal Systems
Attn: JCP Compliance Officer
3900 Commonwealth Boulevard,
Mail Station 300
Tallahassee, Florida 32399-3000

DEP, Southeast District Office
Attn: ERP Section
400 N. Congress Ave., Suite 200
West Palm Beach, Florida 33401-2913

DEP, Biscayne Bay Aquatic Preserve
Attn: Pamela Sweeney
1275 NE 79th Street Causeway
Miami, FL 33138-4206

NMFS
Attn: Jocelyn Karazsia
400 North Congress Ave, Suite 120
West Palm Beach, Florida 33401-2933

FWC, Imperiled Species Mgmt Section
Attn: Jeff Howe
1339 20th Street
Vero Beach, Florida 32960-3559

Miami-Dade Co. PERA
Attn: Lisa Spadafina
Natural Resource Division
33 SW 2nd Street
Miami, FL 33130-1540

8. No work shall be conducted under this permit until the Local Sponsor Agreement between the Department and Miami-Dade County is fully executed and approved by the Miami-Dade County Commission and signed by the Mayor or designee.

9. **Best management practices (BMPs)** shall be utilized where appropriate and maintained at all times during project construction to minimize turbidity generation, including when conditions appear conducive to the encroachment of a turbidity plume into the OFW, and to prevent the spillage of hazardous substances into waters of the state from the dredge and scows. Turbidity control devices shall be installed prior to the commencement of construction in any given area and maintained daily to ensure integrity and functionality until post-construction clean-up of each work area has been completed. **For work at the Julia Tuttle seagrass mitigation site, turbidity curtains shall be installed and maintained during construction. Fill operations shall be suspended when wind velocities exceed 15 knots or when it is determined there is a violation of a turbidity standard.**

10. Staging of equipment is prohibited in areas with hardbottom/reef or seagrass/SAV resources outside the federal channel or other authorized port or anchorage facilities. Anchoring outside the channel shall be minimized to the maximum extent possible in areas with resources and shall be conducted in accordance with anchor monitoring plan (provided in the monitoring section of this permit).

11. **Ingress/Egress** - Due to the presence of hardbottom reefs adjacent to the channel, work vessels and any towed equipment (e.g., cables) shall stay within the designated entrance channel when working west of Station 0 of Cut 1 during transit between the dredging area, the ODMDS (transit shall be through the channel), and/or reef mitigation sites (transit shall be through the corridor). If an impact occurs as a result of the vessel leaving the channel or approved corridor, the Department shall be notified as soon as possible and no later than the next business day, and thereafter a survey team shall be deployed to assess the impact and conduct remediation as necessary. Remediation work (including re-attachment of scleractinian corals) shall be conducted immediately after the survey by the survey crew. Any damage that is not remediated shall be subject to mitigation. Remediation activities shall follow the FLDEP-SEFCRI "Rapid Response and Restoration for Coral Reef Injuries in Southeast Florida, Guidelines and Recommendations" dated June 2007. This report is available at

    http://www.dep.state.fl.us/coastal/programs/coral/reports/MICCI/MICCI_Project2_Guidelines.pdf.

    Additionally,

    a. The Permittee shall comply with the barge monitoring protocol in the EPA's and Corps' September 2008 *Miami ODMDS Site Management and Monitoring Plan* (SMMP), or any subsequent revision to the SMMP by EPA and the Corps. In particular, an electronic tracking system (ETS) shall be used to provide surveillance of the transportation and disposal of all dredged material. The ETS shall continuously track the horizontal location and the vertical draft condition of disposal vessels to the nearest 0.5 foot. The recorded vessel track lines shall be

emailed to the Department on a weekly basis. If a scow is determined to be leaking, use of that scow will cease and required repairs will take place promptly, or change of operation to prevent leakage shall be implemented as a prerequisite to the resumption to the use of the scow.

b. For work at the seagrass mitigation site in Biscayne Bay Aquatic Preserve, vessels shall maintain an absolute minimum clearance of 1 foot over any seagrass communities. If any in-water ingress/egress corridors or staging areas are located within 50 feet of seagrass habitat (other than established port/marina facilities, authorized navigational channels or anchorages), the Permittee shall conduct a pre-construction and post-construction diver survey of habitat above -15' MLLW and within 50 feet of the corridors or staging areas to confirm the presence/absence of seagrasses and monitor for potential unauthorized impacts. Transects shall be spaced so that visual inspection of the entire survey area is made, except that areas devoid of seagrass during the pre-construction survey are not required to be re-surveyed. If impacts occur, the full extent of the impact(s) shall be surveyed and offset with additional mitigation. The seagrass surveys would be done in accordance with the seagrass monitoring protocol established in this permit.

12. At least 15 days prior to the issuance of the initial Notice to Proceed (NTP), and prior to subsequent NTP's, the following items shall be submitted to the Department, with clear reference to the project name and permit number:

a. A written summary of the construction schedule and the specific type of dredge equipment to be used;

b. One (1) electronic copy of the final Plans and Specifications, and one (1) paper copy (sized 11 inches by 17 inches or larger, with all text legible) of the final Plans only, that are consistent with the Activity Description of this permit and the approved permit drawings;

c. A plan view of all staging areas and designated ingress/egress routes for mitigation areas, overlaid on a recent aerial photograph;

d. The names, credentials and contact information for the individuals who will conduct the turbidity monitoring;

e. The names and credentials of the individuals who will conduct the resource surveys;

f. A copy of the Contractor's Environmental Protection Plan, or equivalent, that provides project-specific details of the Best Management Practices (BMPs) that

will be implemented to prevent erosion, turbidity, the release of hazardous substances at the dredge/scow, mitigation sites, staging areas or during the transfer of material to offshore disposal sites; minimization of impacts to hardbottom and seagrasses, and,

g. A copy of the valid EPA authorization for all dredge areas from which materials would be discharged into the ODMDS. If new sediment sampling and testing has been performed in support of the EPA authorization since the previous dredge event, a copy of that testing report and supporting geotechnical, chemical and/or toxicity data shall also be submitted to the Department.

13. Underground utility lines exist in the project area within or near the proposed dredge depths. With the exception of the sewer line and water main which are being relocated, other utilities have been relocated to below dredge depth. Required relocations will occur prior to dredging and blasting within 1,000 feet of the existing sewer line.

WATER QUALITY MONITORING

14. Turbidity monitoring for this project shall be conducted by individuals with prior experience in turbidity monitoring for major dredging projects. Routine turbidity monitoring shall be conducted as follows:

a. LOCATION:

Background – At surface and mid-depth, at least 300 meters upcurrent of the dredge location and clearly outside the influence of turbidity generated by this project or other obvious turbidity plumes.

Compliance (outside OFW) - At surface and mid-depth, not more than 150 meters downcurrent from the dredge location or the artificial reef placement location, within the densest portion of any project-related turbidity plume.

Compliance (in OFW):

At Dredge Sites - at surface and mid-depth, not more than 750 meters downcurrent from the dredge location, within the densest portion of any project-related turbidity plume.

At Seagrass Mitigation Site - at surface and mid-depth, the mixing zone shall extend to a point 15 meters (50 feet) beyond the turbidity curtains located downcurrent from the point of discharge, but not more than 500 meters downcurrent from the point of discharge.

Intermediate: For expanded mixing zone within OFW and where the turbidity plume extends over known hardbottom and seagrass resources - At surface and mid-depth at 150, 300 and 500 meters downcurrent from the dredge

location. This information will be used to justify the size of the mixing zone for future maintenance events, but will not be used to indicate a water quality violation.

b. FREQUENCY:

Background and Intermediate - Samples shall be collected with each compliance monitoring event.

Compliance (both inside and outside OFW) - Approximately every four (4) hours during daylight dredging, beginning approximately 30 minutes after the commencement of dredging, material placement in the seagrass mitigation area, or artificial reef placement. Compliance monitoring shall also be conducted whenever a substantial plume (i.e. a plume that, in the monitors professional judgment, may result in an exceedance of the turbidity standards) approaches the edge of the mixing zone (i.e., 150 meters from the turbidity source) when working outside of OFW or 750 meters from the dredge when plume extends into OFW, or, for the seagrass mitigation site, at a point 15 meters beyond the outermost turbidity curtains downcurrent from the point of discharge (or 500 meters from the point of discharge, whichever is closest), such that a water quality violation may exist.

Nighttime monitoring: Nighttime monitoring will occur at the edge of the mixing zone and within the inner channel only, with easterly limits for turbidity monitoring at night to be approximately FC 10+00 (as currently shown in the permit plates). Randomly, once per week, for the first six calendar months after commencement of dredging in the inner channel, compliance monitoring will be conducted. Nighttime monitoring will not be conducted outside of the inner channel. For each nighttime exceedance, the Permittee will monitor an additional month, with weekly sampling, and such monitoring will only be conducted until conclusion of inner channel dredging operations, regardless of the number of exceedances.

c. MIXING ZONES:

150 meters from the turbidity source when working outside of OFW.

750 meters from the turbidity source when dredging inside of OFW.

500 meters from the turbidity source when working at the seagrass mitigation site (inside of OFW), although the compliance monitoring site may be less.

Transporting dredge and fill material does not qualify as a permitted turbidity source.

d. TURBIDITY STANDARD:

Outside the OFW (i.e., seaward of Government Cut) - Turbidity levels at the edge of the approved mixing zones shall not exceed **29 Nephelometric Turbidity Units (NTUs)** above the turbidity level measured at the background location.

Within the OFW - Project activities at the seagrass mitigation site shall not elevate turbidity more than **9 NTUs** above the turbidity level measured at the respective background location while all other project activities subject to the variance within the OFW shall not elevate turbidity more than **13 NTUs** above the turbidity level measured at the respective background location.

e. CALIBRATION:

Turbidity measurements must be acquired in adherence to the Department's Standard Operating Procedure (SOP) for field turbidity, available at the website:

www.dep.state.fl.us/labs/qa/sops.htm

More specifically, the instruments used to measure turbidity shall be fully calibrated within one month of the commencement of the project, and at least once a month thereafter during project construction. Calibration shall be verified each morning prior to use, and after each time the instrument is turned on, using a turbidity "standard" that is different from the one used during calibration.

15. The following measures shall be taken whenever turbidity levels exceed the values stated above, which would be indicative of a violation of state water quality standards:

a. Immediately cease all dredge or discharge operations that may be contributing to the water quality violation. Cessation of dredging or discharge operations shall continue until monitoring indicates that turbidity levels are meeting the applicable values stated above;

b. Notify the JCP Compliance Officer, at JCPCompliance@dep.state.fl.us, within 24 hours of the time the violation is first detected. The subject line shall include the phrase **"Water Quality Violation."** The violation report shall include the project name, the permit number, a description of the corrective actions taken or proposed to be taken and the turbidity values (background, compliance and the difference) of the violation;

c. Modify the work procedures that were responsible for the violation (such as reducing the dredge rate and/or installing additional BMPs or repairing any non-functioning turbidity containment devices);

d. Increase compliance monitoring frequency to at least every two (2) hours during daylight until all turbidity readings are in compliance with the applicable values

stated above, and monitor at least every four (4) hours during nighttime for the first 24 hours after the exceedance, if feasible due to safety considerations;

e. Provide a copy of all monitoring data sheets to the JCP Compliance Officer within 24 hours of the time when any suspended dredge or discharge operations resume (email acceptable).

MITIGATION - SEAGRASSES

16. This permit authorizes up to 7.9 acres of seagrass impacts. The Permittee shall offset these impacts with at least 16.6 acres of seagrass mitigation. The mitigation planting of seagrasses shall be completed within 2 years following the widening of Fisherman's Channel. If monitoring reveals that unanticipated seagrass impacts have exceeded 7.9 acres, the seagrass mitigation project shall be expanded to achieve the amount of mitigation that the Department determines is necessary according to the Uniform Mitigation Assessment Method (UMAM). If monitoring reveals that total impacts to seagrasses are shown to be less than the expected 7.9 acres, then the required mitigation may be lessened according to the UMAM.

17. The seagrass mitigation shall consist of filling a portion of the dredge hole on the north side of the Julia Tuttle Causeway to restore at least 16.6 acres of a seagrass community. The fill shall be capped with a layer of clean sand containing less than **15%** fine material if the material originates from the project site, or **5%** or less (as certified by the supplier) if the material is imported (percentage of fines is defined as the percent of material passing the number 200 sieve). The cap shall be at least 2 feet thick and achieve final grade at an elevation of -4 feet MLLW plus a construction tolerance of +/- 0.5 feet.

18. After the filling of the mitigation site has been completed, sediment cover sampling shall be conducted for the cap material originating from the project site. Five evenly distributed sediment sample stations per acre shall be established within the area covered. An even number of samples shall be collected at the surface of the fill and at 1.5 feet below the surface. Granulometric analysis of sediments shall be conducted and it shall be demonstrated that neither the average content of fine material (particles less than 0.075 mm in diameter, passing the #200 sieve) throughout the area covered by project material, nor more than two adjacent surface or sub-surface samples, exceed the fines content specified above. After a non-compliant area is delineated, if any, those sediments shall be excavated and replaced with sediments that have been sampled before placement in a statistically appropriate way that demonstrates that the sediments comply with the permit requirements.

19. Mitigation acreage requirements were based on planting seagrasses; therefore, the seagrass mitigation shall include seagrass planting. At a minimum, 7.15 acres of the mitigation area within the filled mitigation site shall be planted with 10 meter x 10 meter

plots (plots) of a climax species compatible with the surrounding seagrass beds at a spacing of 1 planting unit (PU) (i.e., vegetative fragments consisting of shoots and rhizomes) per meter. Seagrass plots shall be distributed in a checkered board layout with alternating planted/unplanted areas of equal size and spacing to maximize vegetative recruitment by rhizome expansion. The planted plots shall be mapped using survey grade DGPS to display the location and distinguish a border where the potential expansion will be documented. With this information, the PU's can be identified within the mitigation area's borders and expansion of the colonizing seagrass can be monitored. *Syringodium filiforme* may be harvested from donor sites at the lateral edges of existing seagrass beds proximal to the mitigation area within the Biscayne Bay Aquatic Preserve, as deemed appropriate by DEP staff, so long as the donor sites are not exposed to extreme conditions such as high wave energy from vessels or wind and current which, following perturbation from harvesting, could be injured to a non-recoverable point. The donor sites from which they are harvested should be 2m to 5m apart to help ensure that seagrasses surrounding the donor site will colonize the denuded areas. Each PU must consist of a bundle of seagrass sprigs (vegetative fragments consisting of shoots and rhizomes) and have at least 4-5 growing rhizome apical meristems, as division of these apical meristems provide a source of new shoots and horizontal growth. The use of "plugs" or "turf" as PU's is prohibited unless they are to be harvested from the impact site where the direct impacts are to occur and can be planted within the same day to ensure the highest possible level of success.

20. A pre-construction survey shall be conducted at the seagrass mitigation area prior to the placement of fill material to determine if *H. johnsonii* seagrasses are present within the fill footprint at elevation -15 MLLW and above. If present, the fill area will be constructed to avoid impacts to these resources.

21. Material that does not meet the criteria for ODMDS disposal, as determined by the Section 103 testing evaluation performed by the EPA, shall not be placed in the seagrass mitigation site.

MITIGATION MONITORING – SEAGRASSES

22. The following activities shall be completed for each year of monitoring:

    a. Conduct subsequent shoot counts to determine if they are growing;

    b. Conduct evaluation of seagrass percent cover of expansion areas (if any);

    c. Calculate the extent to which permit success criteria have been satisfied.

23. In order to assess the success of the seagrass mitigation site, a tiered monitoring protocol shall be implemented as follows. Monitoring shall be conducted annually for a minimum of five (5) years.

    a. Survival: The first monitoring event will take place within 30 days of planting to verify that the PU's were assembled and planted per guidelines specified in the MITIGATION – SEAGRASSES section above and are anchored in the sediment. Quality control during planting should be employed to be sure the work is completed by the contractor as directed. As late in the growing season (i.e. May to October) as possible, each planted unit shall be located with DGPS and evaluated for presence or absence of visible seagrass. Results shall be recorded in a geodatabase for reference over time. Plots with no visible seagrass growth and no rhizomes detected within the first month of planting will be considered to have failed, and no additional monitoring of that plot will be conducted (reference seagrass planting success criteria SC 25.a).

    b. Growth: Permanent transects will be established systematically over the entire 14.3 acre planted site. Decimeter square quadrats shall be used to subsample for short shoots as an indication of seagrass growth. Short shoot counts per quadrat as well as the calculated average count shall be recorded in the geodatabase. Shoot counts shall be conducted toward the end of the growing season (i.e. May through October) and replicated for each transect annually until the expansion coalescence criteria has been met. The edge of the expanded transplanted grass area shall be mapped by DGPS. During mapping of the seagrass edge, the qualified biologist shall note seagrass species and positioning shall be recorded for changes in species along the edges. Visual percent cover shall be estimated for all seagrass species occurring in the quadrat and recorded in the geodatabase.

    c. Expansion: Once seagrass units have coalesced (i.e grown together so there is no discernible edge) over 70% of the 14.3 acres of planted mitigation area, permanent transects with short shoot density monitoring shall be abandoned and percent cover quantitatively evaluated using 0.5 x 0.5-meter gridded quadrats as described below. A sufficient number of transects shall be selected such that no less than 3% of the area shall be quantitatively randomly selected and assessed for percent cover. In addition, 5 reference transects 25m in length will be selected and monitored within the mitigation basin.

24. The assessment of bed density and species composition shall be performed using a quadrat samples during each survey.

    a. Quantitative Sampling (quadrat sampling): To quantitatively describe seagrass cover within the mitigation area and allow for the evaluation of changes in seagrass percent cover, point-intercept quadrat samples shall be evaluated. These

samples shall consist of a systematic selection of 56 DGPS points within the overall seagrass mitigation area and extending a transect at a random heading for a length of 25 meters from each sample point. DGPS sample points and headings shall be repeated during each annual survey. A diver shall swim the transect belts noting the linear extent of bottom type within the 1-meter wide area centered on the transect line.

Point-intercept samples consisting of a 0.5 x 0.5 meter quadrat shall be evaluated at 0, 5, 10, 15, and 25 meters along each of the 56 25-meter long transects. Visual percent cover shall be estimated for all seagrass species occurring in the quadrat, and a score based on the cover of the species in that quadrat shall be assigned according to the following Braun-Blanquet abundance scale:

Braun-Blanquet abundance scores:
0 - Species absent from quadrat
0.1 - Species represented by a solitary short shoot, < 5 % cover
0.5 - Species represented by a few (< 5%) short shoots, < 5% cover
1 - Species represented by a many (> 5%) short shoots, < 5% cover
2 - Species represented by many (> 5%) short shoots 5%-25% cover
3 - Species represented by many (> 5) short shoots, 25%-50% cover
4 - Species represented by many (> 5) short shoots, 50%-75% cover
5 - Species represented by many (> 5) short shoots, 75%-100% cover

b. The point quadrat data across the transect lines shall be used to provide detailed information regarding survival, growth and expansion of planted seagrass. Annual reports shall contain an analysis of changes over time. At the end of 5 years, the seagrass mitigation project shall be evaluated to determine how well it is trending toward success. If success does not appear to be imminent within the following 7 years, the Permittee shall propose appropriate measures to help the project achieve success.

25. Seagrass mitigation shall be determined to be successful based on the following criteria:

a. 70% survival of PU's one month after planting based on an average of all planting plots;

b. Upon failure to demonstrate survival during the first month, the applicant can, within 45 days, either conduct and submit an evaluation to determine the reason for failure or re-plant. If the Department's review of the evaluation, if done, determines re-planting is appropriate, then it will be conducted immediately in order to increase the probability that final success criteria are met. If the Department's review of the evaluation, if done, determines re-planting is not appropriate, then a supplemental UMAM evaluation will be conducted and

additional mitigation may be required. If a second planting attempt does not result in meeting the 30 day success criteria, the applicant will submit an evaluation of the attempted mitigation and propose an alternative/modified mitigation strategy that will result in mitigation for the project impacts as determined by Department UMAM scoring.

c. Average shoot density, percent cover, and total coverage (in acres) data will be collected during years 2-5 (or until coalescence criteria has been met) and will be compared to those obtained within the first year of planting where evaluated for short shoot counts and, if applicable, an estimated area covered per unit. The first year data will be plotted as time zero data to which each successive sampling data (shoot density, percent coverage and/or total coverage) is compared;

d. Success is determined when these data are plotted using a linear regression analysis by whether or not there is a positive trend for the metric (shoot density, percent cover, and/or total coverage) (per Fonseca et al 1998);

e. TREND ANALYSIS: Data taken from measurements of the metrics described above—percent cover, total coverage, and short shoot densities via counts—are used in a 5-year trend analysis. The regression equation will determine if there is a positive trajectory (slope) trending toward expanded growth of planted units and colonization into unvegetated areas, which is suggestive of an equilibrium condition that can be used to project the level of success into the future at certain time intervals (5 years, 10 years, etc.) to reach coverage lost (percent cover and ecosystem services lost) at the impact site. Trend analyses from the reference sites will be used to normalize the mitigation site data. The trend analysis will provide reasonable assurance that there is an increase in density and area covered, indicating growth. Upon failure to demonstrate a positive trend in growth and expansion for two successive years, supplemental planting may be required based on the areas not trending toward success.

MONITORING – SEAGRASS IMPACT SITES

26. Prior to construction of the Miami Harbor Phase III Expansion Project, a seagrass survey shall be conducted to document the full extent of seagrass beds within 200 meters from the edge of Fisherman's Channel, Fisher Island Turning Basin, Lummus Island Turning Basin, Dodge Island Cut, and Dodge Island Turning Basin. In order to quantify the loss of seagrass habitat from the channel/basin widening and deepening, and the associated sloughing of the side slopes, a second survey shall be conducted within one month after the dredging is completed and a third survey shall be conducted one year after construction by the port. During construction, sedimentation monitoring shall also be used to quantify seagrass impacts, if any, from turbidity and sedimentation. Both the pre-construction survey and the 1-year post-construction survey shall be conducted during

peak seagrass growing season. A post construction survey (bathymetric) of cross sections will be provided at 100 foot intervals. To account for natural fluctuations in the seagrass community, reference sites, located outside of the impact area, will be established for sedimentation monitoring through consultation with the Corps and Port and submitted to the Department for approval.

27. a. The pre-construction and post construction seagrass surveys shall be conducted as follows:

- The seagrass beds south of Fisherman's Channel shall be monitored along transects positioned perpendicular to the channel. Transects 200 meters in length, spaced approximately 200 meters apart, shall be set by laying a weighted line marked in one meter increments beginning at the edge of the proposed channel. Transects would begin at approximately Station FC 20+00 and end at approximately Station 30+00 Dodge Island Cut.

- A biologist shall swim the length of each transect to record locations of the limits of each seagrass bed in order to measure the acreage of seagrass habitat lost from dredging and sloughing. This survey shall be conducted pre-construction and both 30 days and 1 year post construction.

- Pre-construction and 30 days post construction, the biologist shall also visually evaluate the degree of sedimentation along the entire length of each transect at the 0, 10, 20, 30, 40, 50, 75, 100, 150, and 200-meter mark and record the extent of sedimentation for each sample point. In determining the degree of sedimentation, the biologist shall use the following 4 categories:

  i. Light accumulation of fine sediments on some blades of grass;

  ii. Accumulation of sediments on more than 50% of the blades;

  iii. All blades are covered with fine sediments and there is a visually noticeable accumulation of fine sediments on the ground between shoots of grass;

  iv. All blades are covered with fine sediments and sediments have accumulated in the pockets between blades to a depth that could bury young shoots.

- A decrease of more than 20%, normalized to the reference sites, in cover and/or abundance in at least two adjacent transects for any 50-meter long

part will be considered a secondary impact. Sediment accumulation of level iii or iv would also be considered a secondary impact.

b. Sedimentation during construction for the area south of Fisherman's Channel shall be measured at monitoring stations set up at each transect. Monitoring stations shall include three (3) sedimentation traps and three (3) sedimentation blocks. Along the transect, a sedimentation trap and a sedimentation block shall be placed at 30, 75 and 150 meters.

Reference monitoring stations: A reference monitoring station, where one sedimentation trap and one sedimentation block will be set to use for comparison, shall be established for each 5 transects. The area adjacent to the southern edge of Fisherman's Channel is off limits to boating activity; therefore, an alternative reference area may need to be selected. The reference area would be located in an area that has similar conditions to Fisherman's Channel in regard to currents, species composition, etc.). Proposed reference monitoring station sites shall be submitted to the Department for approval.

The sedimentation blocks utilized at the seagrass sedimentation monitoring stations shall be cemented to a 2 inches by 16 inch by 16 inch concrete tile that will be positioned level on the bottom within the seagrass beds. Observations made within seagrass beds during previous resource delineation surveys indicate the sediment accumulation blocks can be positioned in grass-free areas within the monitored seagrass beds, resulting in no impact to living seagrass.

Sedimentation observations of all monitoring stations will be conducted by a team of certified divers and qualified biologists.

Survey Frequency: Before active excavation/dredging in Fisherman's Channel, all monitoring stations shall be surveyed after completion of setup to obtain initial baseline conditions. Sedimentation traps and blocks shall be monitored and replaced every 28 days.

For the duration of active construction in Fisherman's Channel, sedimentation stations within a 1500 meter radius of construction shall be surveyed, including corresponding reference sites. After the initial three (3) days of construction, surveys shall be conducted once every three (3) days, for a total of nine (9) days. If no significant impacts are observed, survey frequency shall be collected when bottles are changed out every 28 days. If sedimentation rates adjacent to the channel continually exceed those observed in reference sites, the frequency of surveys shall be increased to once every 3 days until sedimentation rates do not exceed reference sites.

After active construction is completed, monitoring of sedimentation traps and blocks shall continue until at least 30 days after all excavation work in Fisherman's Channel has been completed, construction sections have been accepted, and all necessary agencies are notified of completeness. Until the minimum 30 day period after the completion of construction has elapsed, sedimentation blocks shall be measured and cleaned every 28 days and sedimentation trap data shall be collected when changed out every 28 days.

Samples and observations should be conducted at the reference site first. This will allow divers to notice any significant (>1.5 mm) differences between the reference site and construction monitoring sites more easily.

Reporting: Raw data documenting the accumulation measurements (blocks) prior to dredging shall be made available to the Department upon request. Upon completion of the monitoring, a summary report shall be submitted within 60 days. Raw data on sediment deposition rates obtained by the traps shall also be made available upon request. A final summary report shall be submitted within 60 days of completion.

A sediment stress event shall be defined as a significant build-up of sediment sufficient to cause any one or more of the following conditions beyond the distance of the 1:7 side slope (approximately 100 feet from the new channel edge) that is already considered a loss and provided for in the seagrass mitigation site of the project's limit:

- Increased epiphytes or biofouling of blades relative to the reference site;
- Reduced seagrass density compared to pre-construction conditions, with adjustments made for natural fluctuations as determined from monitoring data from the reference site

Notification of a sediment stress event or the identification of a secondary impact as described in Specific Condition 27(a) iii & iv will be by phone, fax, or e-mail, and followed by a written report to be submitted within 24 hours to the agencies. If necessary, survey frequency may be increased and/or dredging procedures may be modified to reduce impacts.

28. Monitoring reports shall be provided to the JCP Compliance Officer within 90 days following each of the 3 surveys. Each report shall include a map showing the extent of observed seagrass beds and the location and station number of transects and quadrats. The reports shall also document the degree and aerial extent of sedimentation, and the changes in percent cover between surveys. The report for the 1-year post-construction survey shall also compare the difference in seagrass acreage between the pre-construction

survey and the 1-year post-construction survey. That report shall also include the areal extent of secondary impacts to seagrasses.

TRANSPLANTATION AND MONITORING OF TRANSPLANTED CORALS

29. **Transplantation of Scleractinian Corals:**
Consistent with the project's Florida Coastal Management Program consistency determination, all scleractinian corals >25 cm in maximum diameter shall be collected from direct impact areas in the Outer (3rd) Reef and transplanted. Fifty percent will be transplanted to the mitigation reefs to be constructed as part of this project, and fifty percent will be transplanted to the existing natural reef. Additionally, up to 1300 scleractinian corals >10 cm and <25 cm in maximum diameter shall be collected from direct impact areas in the Outer (3rd) Reef and transplanted. Fifty percent will be transplanted to the mitigation reefs to be constructed as part of this project, and fifty percent will be transplanted to the existing natural outer (3rd) reef. A total of 9.28 acres of artificial reef shall be constructed. Colonies with signs of disease and/or boring sponges, and colonies that are not expected to survive transplantation shall not be relocated.

Healthy scleractinian corals (without diseases and boring sponges absent) shall be carefully removed from the substrate using a chisel and hammer, and either cached for a short period of time (1-2 days, with no storm in the forecast) in a safe place, or collected into baskets and lifted by a diver as the basket is filled or at the end of the collection dive, wrapped in bubble wrap, and then transferred into cooler containers filled with seawater, and transported to the designated areas in the mitigation reefs.

The attachment of corals to the substrate shall be conducted in such a manner that corals of the same species will form small groups of 10-20 colonies growing close to one another with an average density of about 1.0 colony per meter^2. Corals shall be transplanted preferably on micro-relief features (bumps, hills, etc, scale of 0.1-0.3 meters) on the tops of boulders in the artificial reefs; *Agaricia* spp., *Madracis* spp., and *Mycetophyllia* spp., can be transplanted on to vertical or subvertical parts of the mitigation reefs. If found, corals of the genera *Mycetophyllia*, *Scolymia*, *Colpophyllia*, *Dendrogyra*, *Mussa*, *Isophyllia*, *Isophyllastrea*, *Favia*, and *Acropora* shall be transplanted irrespective of size. *Acropora spp.* shall be relocated in accordance with the project specific biological opinion issued by NMFS on September 8, 2011. The surface of the substrate in the recipient location shall be cleaned of algae, cyanobacteria, and sediments with a wire brush. Portland cement and/or underwater epoxy glue can be used for the attachment of scleractinian coral colonies.

The time in the cooler prior to transplantation shall be minimized as much as possible. Coolers shall be kept in the boat away from direct sunlight and external heating.

30. **Monitoring of Scleractinian Corals after Transplantation:**
The size of all scleractinian corals shall be measured prior to the detachment (only the largest dimension), then, after the detachment, sorted and recorded by the species and size classes (I - 0-5cm; II - 5-10cm; III - 10-25 cm; IV - 25-50 cm; V - >50 cm). After the transplantation of scleractinian corals, 250 corals relocated to the artificial reef shall be tagged and monitored. All size classes of each species of corals represented during the collection of corals in the impact zone shall be proportionally represented in the monitoring surveys.

For each transplanted species of coral, 5 corals shall be found of the same representative classes for control surveys, unless the number of transplanted corals was less than 5, in which case the number of control colonies shall be the same as the number of transplanted corals. Corals represented by a single colony shall not be required to have controls for monitoring. Reference colonies will, to the greatest extent possible, be free of notable disease, bleaching or other indicators of stress.

All corals selected for tagging and monitoring, including each reference colony, shall be photographed with a rule present for scale. At least one photograph should be above the colony from fixed distance to be able to estimate surface area of the colony and at least one photograph should contain the unique identifier label. The following information shall be recorded for each coral selected for tagging and monitoring, including each reference colony:

a. Species (to the lowest taxonomic rank possible);

b. Colony size to include length (longest axis), width (perpendicular to longest axis), and height (in direction of growth);

b. Depth of water where colony is located;

c. Colony orientation;

d. Overall health (i.e. presence of disease or bleaching, percent live tissue); and

e. Location of the colony, through either GPS coordinates of the colony or GPS coordinates for a reference location (or relocation) and distance and compass bearing from the reference location.

Monitoring for Scleractinian Corals shall be conducted at the following stages: one month after the transplantation, 6 months after the transplantation, 1 year after the transplantation, and 2 years after transplantation.

Success of the Scleractinian Coral transplantation on the artificial reef shall be based on the following criteria: after 2 years, survival of 75% for corals measuring 10-25 cm and 85% for corals measuring >25 cm. If less than the success criteria, the survival rates shall be compared to the survival rates at the reference sites and tested for statistically significant differences and adjusted accordingly. If the percent survival, or adjusted percent survival, of a coral species is below these levels, additional corals of the same species shall be transplanted using corals found detached in natural communities or from an approved nursery.

The initiation and completion of transplantation and the transplantation progress shall be reported to the JCP Compliance Officer via e-mail weekly or the information made available via web site. Monitoring reports shall be submitted within 60 days upon completion of each survey. Initiation and completion of each survey shall be reported to the JCP Compliance Officer.

MITIGATION ARTIFICIAL REEF MONITORING

31. Artificial reef(s), per SC 29 above, shall be built south of the channel in the sandy trough between the Outer (3rd) and Inner (2nd) reefs, as mitigation for unavoidable impacts to coral reefs and hardbottom communities from the Project. The artificial reef(s) shall be built of limestone boulders, with minimum plan form dimensions (length x width) of 3' x 3', such that the sand patches between the boulders do not exceed 10% ± 5% of the total reef area. Comparable to the Outer (3rd) reef impact site, 60% ± 5% of the artificial reef shall have a low relief (< 3 feet), and 40% ± 5% of the artificial reef shall contain high relief (>3 feet).

Monitoring of the artificial reef shall require:

a. A pre- and post-construction survey which shall include:

i. A pre-construction bathymetric survey will be conducted to establish baseline conditions. The survey will be used to compare to future post-construction surveys to evaluate any evidence of subsidence.

ii. A post-construction bathymetric (multibeam) and side scan survey will be conducted after all reef mitigation material has been placed in its designated site. A comparison between the pre- and post-construction survey will evaluate if the proper amount of high relief and low relief was achieved. The survey information will be utilized to demonstrate the boundaries of the sites (including total acreages), relief of the sites (provided in a color coded map to distinguish areas of low and high relief, with total acreages of each relief type), rugosity, and interstitial area (percent sand cover versus percent boulder cover for each reef unit/pile). Calculations for high relief areas and low relief areas

shall be conducted separately. Cross sections shall be taken at 50 foot intervals to determine relief, rugosity, and interstitial area. The calculations shall be run on each cross section, and an overall average. Towed or pole mounted video shall be conducted at 100 foot intervals as verification of the survey information. Diver surveys (line-intercept measurements) will only be conducted if the bathymetric survey information is determined to be deficient for estimating the criteria cited above.

iii. If needed, following construction of the artificial reef, divers shall conduct a line-intercept survey as part of the as-built survey in order to verify the information required in the as-built survey. The survey shall be conducted using 30-meter long stretched transects. Transects shall be plotted beginning from randomly generated start points and degree headings for each transect, with approximately 4 transects per acre of artificial reef. During the line-intercept survey, divers shall swim the length of each transect and record the projection of limestone boulders on the transect line using a plumb-bob. Based on the data collected along all transects, the percent net boulder cover and percent sand cover within the artificial reef site will be calculated and reported.

Corrective measures shall be undertaken if the results of the artificial reef surveys show that less than the required area of artificial reef was constructed, if one of the components (low relief/high relief) of the artificial reef is incorrect, or if sand occupies more than 10% ± 5% of the reef area.

b. Artificial Reef Monitoring Protocol

i. ***Permanent Transect Establishment and Monitoring.*** In order to monitor benthic colonization and succession, four (4) 20-meter long permanent monitoring transects per acre of artificial reef shall be established with ten (10) 1-meter square quadrats per transect.

a) Photographs of each quadrat shall be taken to supplement quadrat in situ data along each transect, or

b) Video Documentation shall be collected along the 20-meter long transects to supplement the quadrat data and analyzed using standard PonitCount99, CPCe, or approved similar method.

ii. ***Schedule.*** Within 30 days following construction of the artificial reef, the bathymetric survey of the outline of the reef shall be conducted, and then all other parts of the as-built survey shall follow. The artificial reef permanent monitoring transects shall be monitored annually (summer) for

five years following placement of the artificial reef. During the final (fifth) monitoring survey, the artificial reef shall be mapped once again (repeat as-built survey).

iii. ***Success***. Success will be achieved when the benthic community and colonization of the mitigation reef has been documented to be comparable to the benthic community and species composition documented in the impact area of the Outer (3rd) reef during the preconstruction survey (DCA, 2011). Successful mitigation shall be defined by the following criteria: 75% of species found in the impact site shall be present in the mitigation site by the time of the completion of the monitoring period; and percent cover by the major groups of organisms in the mitigation site shall be no less that it was in the impact site.

iv. ***Reports.*** The as-built survey report shall be submitted within 30 days of the completion of the survey. The annual mitigative artificial reef monitoring reports shall be submitted within 90 days of the completion of each annual monitoring event, but no later than 1st of December of each year. Monitoring progress shall be reported weekly until the completion of each survey, at which point the JCP Compliance Officer shall be notified that the survey is complete. Each annual report shall document the colonization of the artificial reef and compare the species composition on this reef to that documented in the impact area during the preconstruction survey. Annual monitoring reports shall include:

- A map of the artificial reef with the associated monitoring transects plotted on it;
- An analysis of the quantitative quadrat data on the benthic biological components of the artificial reef monitoring transects (*e.g.*, percent cover by corals, octocorals, sponges, algae, etc.);
- A comparative analyses of the mitigative artificial reef and natural hardbottom resources to determine mitigation success;
- An analysis of succession based on the comparison of benthic communities found on the artificial reef and natural communities (impact site) by comparison of such parameters as densities, size class distribution, etc.;
- Current acreage, relief, and rugosity of artificial reef (for final report only);
- Copies of all transect video submitted on DVDs; and,
- All raw data in the format that was used for the analysis.

If the artificial reef has either less acreage than was required in the permit by the time of final (5th) survey, or succession does not achieve the status

of communities that existed at the impact site (criteria indicated above), then additional mitigation shall be required.

REQUIRED MONITORING FOR SECONDARY HARDBOTTOM IMPACTS

32. **Biological Monitoring (Coral, Hardbottom and Seagrass)**
The proposed monitoring of the Miami Harbor Channel deepening and widening project includes monitoring for direct and indirect impacts to hardbottom and coral reef communities, and seagrass beds in the project area and adjacent areas. Monitoring activities shall include pre-, during, and post-construction surveys of hardbottom and coral reef communities, and seagrass beds.

Monitoring in the areas of hardbottom communities and coral reefs.
Monitoring of reefs and hardbottom communities shall include:

a. **Monitoring in Permanent Stations**
Monitoring in Permanent Monitoring Stations shall be conducted to document possible long-term effects of the channel dredging project on the reef and hardbottom communities adjacent to the channel boundaries, which include the Outer (3rd) and Inner (2nd) reefs, and Colonized Pavement (nearshore ridge system). Permanent monitoring stations were established in representative areas of Outer (3rd) reef, Inner (2nd) reef, and Colonized Pavement type of hardbottom during the Baseline Hardbottom Study (DCA, 2011;), and required biological monitoring of these permanent transects shall use the same methodology which was used the Baseline Hardbottom Study. Surveys of the permanent monitoring stations shall include: preconstruction, immediate post-construction, and one year post-construction. If any impact from the project is documented, the permanent station monitoring shall be conducted annually for three years following construction, in the stations where the impact was documented as well as in the control station.

Three 20-meter permanent transects shall be established 10 meters from the channel edge in a north-south direction at each hardbottom habitat type station identified in the Baseline Report (R3N; R3S-1; R3S-2; R3S-3; R2N-1; R2N-2; R2S-1; R2S-2; HBN; HBS) with the addition of the following stations:

1. X1S – South side of Cut 2 at Sta. 40+00,
2. X2S – South side of Cut 2 at Sta. 20+20,
3. X3S – South side of Cut 1 at Sta. 74+75,
4. X1N – North side of Cut 2 at Sta. 33+50, and
5. X2N – North side of Cut 2 at Sta. 13+50.

This will result in a total of 15 stations and 45 transects that are 20 meters long by 0.40 meters wide, equaling 360 meter^2 of the project area being directly monitored. Additionally, eleven control sites in analogous habitat areas of equal length and width for a total of 264 meter^2 will also be monitored to detect natural variation in the resources and to assist in determining the effects of the actual dredge operations on the resources surrounding the project area.

Transects within the individual stations will be spaced at least 5 meters apart. They will be randomly positioned within areas that include coral colonies and other attached fauna within each specific resource type. Stainless steel eyebolts (3/8 in x 8 in) will be drilled and cemented/epoxied into the bottom at 0, 10, and 20 meters along each transect at the hardbottom and reef sites. A small submerged buoy coated with anti-fouling paint will be attached to each eyebolt with a short length of nylon braided line to aid in transect relocation. All transect marker eyebolts and buoys will be removed following completion of the monitoring program. Quantitative digital video surveys shall be conducted along each transect with the camera positioned 40-cm above and perpendicular to the substrate. This will yield an approximately 40-cm wide video field-of-view. The videocamera will be equipped with lights and a measuring stick or calibrated lasers to ensure that the camera remains at the 40-cm distance to the bottom. The diver will swim the camera along each transect at a speed of no greater than approximately 5 m per minute. This method will be used to evaluate both the coral health and potential sedimentation stress during construction at both the dredge location site and the control monitoring station sites, as further described below:

i. Construction Period Surveys for Coral Health. The monitoring stations are located strategically along the channel, and were selected to help monitor any environmental change or sedimentation impact and/or stress on biological organisms attributed to construction activities.

a) Construction surveys shall be conducted at each transect within each monitoring station by qualified biologists and involve:

1) Evaluating benthic organisms (scleractinian corals, octocorals, sponges, etc.) for standing sediment that is not removed by normal currents or wave action;

2) Evaluating scleractinian corals along each transect for additional indications of sedimentation stress such as excessive mucus, extruded polyps, and color changes (bleaching or paling). All scleractinian corals on each transect will be assessed for each of the health parameters

and assigned a health level of "0" or "1" for each parameter (A score of "0" would indicate no observed bleaching, excess mucus production, polyp extension, or disease, while a "1" would be indicated for each observed parameter – please see example below). This data will be collected for each project area transects and each control area transect.

b) Reef conditions during construction surveys shall also be documented through digital photographs and video. Photographs will include:

1) Wide angle reef scenes (as visibility allows);

2) Close-up photographs documenting organisms experiencing potential sediment stress (i.e., burial, excess mucus, extruding polyps, and color change);

3) Video or still photography will be taken of each transect within each monitoring station 0.4 meters from the bottom, perpendicular to the transect, off the bottom.

c) Survey Frequency

1) Before active dredging, the reef habitat surrounding Cuts 1 and 2 of the entrance channel will be surveyed at least once a week for four (4) weeks to establish baseline conditions at the monitoring stations;

2) For the duration of active dredging (construction), the reef habitat surrounding Cuts 1 and 2 of the entrance channels will be surveyed twice a week at the monitoring stations within 750 meters of the dredging activity (only when dredging occurs within 750 meters of reef or hardbottom habitat);

3) After active dredging, the reef habitat surrounding the entrance channels will be surveyed at least once a week for four (4) weeks.

d) Reporting

1) A report will be submitted documenting the survey efforts prior to dredging. This report along with raw data will be submitted within 30 days upon monitoring completion;

2) During active dredging, weekly reports will be submitted via e-mail (or web site) describing survey results;

3) A report will be submitted after construction detailing the results for the four week post construction surveys. This report along with raw data will be submitted within 30 days upon monitoring completion;

4) Notification of sediment stress will be by phone, fax, or e-mail, and followed by a written report to be submitted within 24 hours to the agencies. Agencies will be notified immediately of the possibility of unacceptably high sediment levels on the reefs (or on the next work day if the indicators are noted on a weekend or holiday).

ii. **Qualitative Construction Surveys for Indication of Sediment Impact and/or Stress.** These stations are a subset of the stations from the Construction monitoring stations for coral health designed to monitor any environmental change or sedimentation impact and/or stress on biological organisms attributed to construction activities as described above. In addition to construction monitoring, sediment monitoring shall be conducted as outlined below:

a) Construction surveys shall be conducted by qualified biologists at the monitoring station transects;

b) Survey Frequency:

1) Before active dredging, the reef habitat surrounding Cuts 1 and 2 of the entrance channels shall be surveyed at least once a week for four (4) weeks to establish baseline conditions;

2) For the duration of active dredging (construction), the reef habitat surrounding Cuts 1 and 2 of the entrance channels shall be surveyed twice a week at the monitoring stations that are within 750 meters of the

dredging activity (only when dredging occurs within 750 meters of reef or hardbottom habitat);

3) After active dredging, the reef habitat surrounding the entrance channels shall be surveyed at least once a week for four (4) weeks.

c) Sediment stress will be defined as build-up of sediment significantly above the level found at the control or reference stations sufficient to cause any one or more of the following conditions as observed by the monitoring biologists:

1) A frequency of observed bleaching (partial or complete) of scleractinian coral colonies;

2) Excessive mucus produced by scleractinian corals to remove sediment from their surface, resulting in binding of sediments and transport of bound sediments off the coral's surface and subsequent accumulation of the sediments at the base of the coral head. Such accumulations have been seen to initiate a "self burial" process, causing death of the lower tissue of the coral head;

4) Covering of benthic community components (i.e., sponge, algae) by sediment for sufficient time or sufficient sediment so as to note death or degradation (i.e., bleaching, pigmentation changes) of the underlying organisms.

d) Any change of 5% or more in cover by any functional group evaluated in quadrats in two or more adjacent transects, or on average for the zone of monitoring on one side of the channel, or stress expressed above normal by corals and/or octocorals within transects (stress scale used for Broward County Segment III project) will require an additional survey to outline the area(s) of impact. Impacted areas shall continue to be monitored monthly during the construction, one month post-construction, and two times during next year in order to document results of the impact. Final monitoring results shall document permanent impacts, if any, to be used for estimates of additional mitigation using UMAM.

iii. Quantitative Construction Sedimentation Monitoring. Sedimentation Monitoring is adapted from the multi-agency developed plan from the Key

West O&M Dredging and approved by FLDEP; USACE; NOAA-NMFS and NOAA-FKNMS.

a) Net Sediment Accumulation Data:

1) A net sediment accumulation block shall be placed at each of the 15 monitoring stations. The block location coordinates shall be recorded and serve as the center point of the monitoring station. The sediment accumulation blocks may provide sedimentation data more similar to accumulation of sediments on corals and seagrasses when resuspension due to wave actions and water flow is allowed to occur, may provide information more quickly to allow an immediate response should conditions warrant. These data also can be directly compared with the available published data on impacts of specific quantities of sediment on coral health. The sediment accumulation block data shall be utilized to determine if sedimentation and individual monitoring site has exceeded threshold levels as referenced in SC 32.a. iii.a.2 below;

2) Measured net sediment accumulation levels at project area sites where corals show decline potentially associated with dredging shall be used to adjust or ground truth the sedimentation average rate of 1.5 mm per day above the reference site accumulation currently proposed as the maximum for the project. Evidence of 1) coral decline (per SC 32.a.ii.d), or 2) sedimentation rate of 1.5 mm per day above the reference site that results in stress as defined in SC 32.a.ii.c defines a significant event; In the case of a significant event, the dredging operation must move to a new location until: 1) effected organisms have recovered (signs of stress are no longer visible) as approved by a biologist, or 2) a determination is made that it is potentially a secondary impact and the protocols in SC 32.a.ii.d for monitoring and additional mitigation , if any, shall be followed.

3) The net sediment accumulation block shall consist of an 8" x 8" x 8" concrete block attached to the bottom with hydraulic cement. The block shall have one side coated with antifouling paint, which shall be oriented as the upper

surface. The antifouling paint should help minimize the bio growth on the upper surface of the block, which could interfere with sediment accumulation and cause increasing errors in sediment accumulation measurements as the program progresses. The block shall be cemented to the bottom with the upper surface level at a hard bottom or reef, and shall be attached only to expose rock surfaces devoid of benthic fauna and no closer than 30 cm from any stony coral colony;

4) Following the re-occupation of each station during the subsequent monitoring surveys, sediment depth or accumulation on the block shall be measured first to prevent the disturbance of the sediment layer by divers collecting other data. The accumulated sediment depth shall be measured at five positions on the upper surface of the block;

5) Measurements shall be made in the center and at four points approximately 2.5 in. toward the center from each corner of the block. Sediment accumulation depth measurements shall be recorded from these five positions, and the block shall be swept clear of sediments as the last step before leaving the site. Any observations of fishes or invertebrates impacting the sediment layer on the block also shall be recorded. Following the completion of the dredging project and monitoring program, all sediment accumulation blocks shall be removed from both seagrass areas and hard bottom/reef stations.

b) Survey Frequency:

1) Installation of sediment blocks and sediment depth transect reference stakes shall occur a minimum of 28 days prior to construction activity;

2) Before active excavation/dredging, reef sediment accumulation measurements shall be surveyed along the fixed transect at least once a week for four (4) weeks to establish baseline conditions;

3) For the duration of active construction in the entrance channel, reef sediment accumulation measurements shall

be taken along the fixed transect at the monitoring stations that at the monitoring stations within 750 meters of the dredging activity (only when dredging occurs within 750 meters of reef or hardbottom habitat) at least once a week during construction;

4) After active construction is completed:

(a) Reef sediment blocks shall be changed out 28 days after excavation work is completed at all sediment stations;

(b) Reef sediment accumulation measures shall be taken once a week for four weeks after excavation work is completed.

c) Sediment Traps:

1) Arrays of three sediment traps shall be placed at each of the hardbottom monitoring stations (including controls) to allow the comparison of net sediment accumulation block data with sediment trap data. The sediment traps shall be constructed of 1.0 in. inside diameter x 8 in. length polyvinyl chloride (PVC) pipe and a 500-ml Nalgene collection jar, similar to the design being used in the Broward County Shore Preservation Project monitoring program. Both trap necks and jars shall be coated with anti-fouling paint to minimize epibiotal growth. The PVC traps with the attached jar lids shall be fastened to the steel sediment trap frame with hose clamps. The frame shall be drilled and cemented into the bottom at hard bottom stations. Following completion of the monitoring program, all sediment traps, frames, and blocks shall be removed.

2) The traps shall be positioned with the mouth of the trap no more than 18 in. above the bottom. Sediment traps shall be changed at 28-day intervals by unscrewing the Nalgene trap jars from the PVC collars and capping the jars. New jars then shall be attached to the trap collars for the next collection interval. Sediment samples shall be transported to the laboratory where the water and sediment shall be filtered through labeled pre-weighed

filters. The filters and sediments shall be rinsed with fresh water to remove salts, and the filters containing the sediments then shall be dried in an oven and weighed.

d) Reporting:

1) Raw data documenting the sedimentation deposition rates (traps) and accumulation measurements (blocks) prior to dredging shall be made available upon request, and a summary reported submitted within 60 days of construction completion;

2) During active dredging in the entrance channel, weekly reports shall be submitted via e-mail (or web site) describing sediment accumulation measurements. Raw data from sediment deposition rate data (traps) shall be made available upon request, with a summary report submitted within 60 days of construction completion.

3) Raw data detailing the results for the four-week post construction surveys shall be made available upon request with a summary report submitted within 60 days of construction completion.

4) Notification of significant events as defined in SC 32.a.iii.a.2 shall be by phone, fax, or e-mail, and followed by a written report to be submitted within 24 hours to the agencies (or on the next work day if the indicators are noted on a weekend or holiday).

Quality Assurance/Quality Control (QA/QC). Qualified marine biologists trained in conducting hardbottom monitoring surveys shall conduct this work (minimum qualification of BS in marine biology and documented experience with hardbottom monitoring surveys). Inter-observer variability exists through the level of detail as defined by each marine biologist when utilizing similar survey methods, particularly in methods of rapid assessment that will used for this survey. Therefore, additional QA/QC measures will include the collection of a sample data set by each marine biologist in two transects of the initial set of transects. This QA/QC test will be conducted **prior** to collecting project-specific data (i.e., before commencement of dredging). The initial QA/QC exercise shall observe swimming technique and measurement collection along the transect line. The sediment depth measurements of each surveying crew member shall be compared to one another and statistically treated. The results of the sample data set shall be reviewed by the team to ensure consistency in species identification, percent cover

(not more than 10% deviation), sediment thickness (not more than 1 mm average difference), and/or the level of detail of organisms observed. Variability of ≥10% and/or unidentified organisms may require the collection of a second sample data set, to be determined onsite by the team leader.

Prior to entering the data into a project-specific Microsoft Access database, the field forms will receive a final review for completeness and accuracy. The database will be used to manage the data collected during the monitoring events. This form of database management incorporates quality control during the data entry process through standardized formatting and summation of functional groups. Data review and interpretation shall be a **permanent process** of comparison of repeatable surveys. The comparison will be conducted by individual transect (i.e., what is the change in each individual transect), and then by the entire set of transects on one side of the channel, and finally, a comparison of the changes documented on one side of the channel to those documented on the other side.

33. A pre-construction survey shall be conducted at the northern mitigation reef site, and the location(s) of any benthic communities identified in the survey shall be recorded by DGPS. During reef construction, no material shall be placed within 30 meters of the hardbottom communities. A copy of the survey shall be submitted to the Department prior to engaging in reef mitigation activities.

34. DGPS coordinates shall be obtained by pre-construction survey or from the party responsible for the existing outfall pipe in the southern mitigation reef site. During artificial reef construction, no material shall be placed within 30 meters of the outfall pipe.

The Contractor shall limit dredge anchorage such that contact with and impacts to seagrasses and hardbottoms outside the channel is minimized/avoided. The approximate locations of these resources are shown in the permit plates. Anchor placement shall be placed to avoid affecting any of the sedimentation monitoring stations.

Coordinates of all dredge anchor drop points shall be recorded using DGPS technology, accurate to one (1) meter. Impacts to seagrasses and hardbottoms shall require remediation and, if not fully remediated, shall be subject to compensatory mitigation. Divers shall visit all anchor locations that were positioned within the perimeter of a seagrass bed or hardbottom area within 14 days of anchor being removed to investigate and record potential damage to seagrasses and hardbottoms. Anchor damage to these resources shall be reported to the Department within 2 business days of discovery of impact. These investigations shall be certified by a marine biologist with appropriate qualifications, as described above.

THREATENED AND ENDANGERED SPECIES

35. *Acropora sp.* shall be relocated in accordance with the project specific biological opinion issued by NMFS on September 8, 2011.

36. The following conditions shall be followed to protect manatees and marine turtles during all in-water dredging activities:

    a. All personnel associated with the project shall be instructed about the presence of marine turtles, manatees and manatee speed zones, and the need to avoid collisions with (and injury to) these protected marine species. The Permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act, the Endangered Species Act, and the Florida Manatee Sanctuary Act.

    b. All vessels associated with the construction project shall operate at "Idle Speed/No Wake" at all times while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels shall follow routes of deep water whenever possible.

    c. Siltation or turbidity barriers shall be made of material in which manatees and marine turtles cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid manatee entanglement or entrapment. Barriers must not impede manatee or marine turtle movement.

    d. All on-site project personnel are responsible for observing water-related activities for the presence of marine turtles and manatee(s). All in-water operations, including vessels, must be shutdown if a marine turtle or manatee comes within 50 feet of the operation. Activities shall not resume until the animal(s) has moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the animal(s) has not reappeared within 50 feet of the operation. Animals must not be herded away or harassed into leaving.

    e. Any collision with or injury to a marine turtle or manatee shall be reported immediately to the FWC Hotline at 1-888-404-3922, and to FWC at ImperiledSpecies@myFWC.com. Collision and/or injury should also be reported to the FWS in Vero Beach at 1-772-562-3909. Care should be taken in handling sick or injured marine turtle specimens to ensure effective treatment and care and in handling dead marine turtle specimens to preserve biological materials in the best possible state for later analysis of cause of death. In conjunction with the care of sick or injured endangered or threatened species or preservation of biological materials from a dead animal, the finder has the responsibility to ensure

that evidence intrinsic to the specimen is not unnecessarily disturbed.

f. Temporary signs concerning manatees shall be posted prior to and during all in-water project activities. All signs are to be removed by the Permittee upon completion of the project. Temporary signs that have already been approved for this use by the FWC must be used. One sign which reads *Caution: Boaters* must be posted. A second sign measuring at least 8 ½" by 11" explaining the requirements for "Idle Speed/No Wake" and the shut-down of in-water operations must be posted in a location prominently visible to all personnel engaged in water-related activities. These signs can be viewed at www.MyFWC.com/manatee. Questions concerning these signs can be sent to the email address listed above.

g. Dedicated observers shall be designated when in-water work is being performed on a dredge, other than a cutterhead or backhoe dredge, and shall perform no other duties that may interfere with their ability to observe for protected marine species (such as manatees, marine turtles, dolphins, etc.) during dredging activities. That person shall have significant prior on the job experience observing for protected marine species (including manatees) during previous dredging events where the activities were similar in nature to this project. Observers shall be equipped with polarized sunglasses to aid in observation during the daytime. A dedicated observer must be on site during dredging activities, other than cutterhead or backhoe dredge activities, and will advise personnel to cease operation upon sighting a protected marine species within 50 feet of any in-water construction activity.

h. A list of the observers, their contact information and their qualifications, must be included in the Environmental Protection Plan. Copies of this Plan shall be provided to the FWC at ImperiledSpecies@myfwc.com for review at least 30 days prior to the proposed dates of the dredging(s) as a matter of comity. Any further modifications to this Plan related to observers shall be coordinated with these entities prior to implementation. These entities shall also be notified at the initiation and completion of dredging events.

i. A log detailing work activities, sightings, collisions, or injuries to protected marine species during the contract period shall be maintained. Observer logs and a report summarizing incidents and sightings shall be submitted to the FWC, Imperiled Species Management Section at: ImperiledSpecies@myfwc.com. Logs and a report shall be submitted within 30 days following each event, which is defined as the time period between when mobilization of equipment begins and when demobilization of equipment ends, or submitted on an annual basis, for multi-year projects.

j. During construction, project lighting shall be limited to the immediate area of active construction only and shall be the minimal lighting required to comply with U.S. Coast Guard and/or OSHA requirements. Stationary lighting and all lighting on equipment shall be minimized through reduction, shielding, lowering, to the maximum extent practicable while complying with COE EM 385-1-1 (2003) U.S. Army Corps of Engineers Safety and Health Requirements Manual and applicable OSHA/USCG regulations - Specifically - 07.A.04 Marine lighting shall be in accordance with American National Standards Institute/ Illuminating Engineering Society of North America (ANSI/IESNA) RP-12, and appropriate placement of lights to minimize illumination of marine turtle nesting beaches.

k. When clamshell dredges are used, the bucket shall be released at the water surface during any nighttime dredging (gravity release method).

BLASTING

37. A Blast and Watch Plan (Plan) shall be developed and submitted to the Department for review as to consistency with the permit prior to any blasting activities that will specify protected marine species (such as manatees, marine turtles, dolphins, etc.) protection measures to be employed before, during and after each blast. This Plan must adequately incorporate all protection requirements for a blasting and watch program, and include all additional information needed for the specific blasting project event(s), inclusive of strict adherence during all blasting events. No blasting detonation may occur before 90 minutes after sunrise nor within 90 minutes prior to sunset. Sunrise and sunset times will be determined using NOAA's published times.

38. Copies of this Plan shall be provided to DEP, FWC, FWS and NMFS for review at least 30 days prior to the proposed date of the blast(s) as a matter of comity. Any modifications to this Plan shall be coordinated with these entities prior to implementation. These entities shall also be notified at the initiation and completion of all in-water blasting events. The addresses for FWC, FWS and NMFS are as follows:

a. FWC: Imperiled Species Management Section at ImperiledSpecies@myfwc.com and Dr. Allen Foley at Allen.Foley@myfwc.com;

b. FWS, 1339 20th Street Vero Beach, FL 32960;

c. NMFS-PR1, 1315 East West Highway, Silver Spring, MD 20910; and,

d. NMFS-SERO-Protected Species Management Branch, 263 13th Ave South, St. Petersburg, FL 33701

39. If blasting is proposed during the period of 1 November through 31 March, significant operational delays would be expected due to the increased likelihood of manatees being present within the project area during this time of year. If possible, the Permittee shall avoid scheduling proposed blasting during this time period.

40. After each blasting event, the observers and contractors shall evaluate any problems encountered during blasting events and logistical solutions shall be presented to the Permittee. Corrections to the watch or blast plan shall be made prior to the next blasting event.

41. If an injured or dead marine mammal or marine reptile is sighted after the blast event, blasting shall be postponed until consultations with the applicable resource agency(ies) listed below are completed and determinations can be made of the cause of injury or mortality. If blasting injuries are documented, all demolition activities shall cease until a revised plan addressing the likely cause of injury or death is agreed upon by the Permittee, FWC, NMFS and FWS. In the event of an injury or death, the Permittee shall contact the resource agencies at the following phone numbers:

    a. FWC Hotline: 1-888-404-FWCC and 850-922-4330 (manatees);

    b. FWS Vero Beach: 772-572-3909 (manatee and crocodile);

    c. NMFS SERO-PRD: 772-570-5312 (sea turtles and sawfish);

    d. NMFS- Emergency Stranding Hotline – 1-877-433-8299

42. Within 30 days after completion of all blasting events, the observer coordinator shall submit a report to the Permittee, who shall provide it to FWC, NMFS and FWS providing a description of the event, number and location of animals seen and what actions were taken when animals were seen. Any problems associated with the event and suggestions for improvements shall also be documented in the report.

43. Minimum requirements that must be incorporated for each individual blast into the Blast and Watch Plan are:

    a. Blast Plan: The amount of explosive charge proposed, the explosive charge's equivalency in TNT, how it will be executed (depth of drilling, stemming, amount of time between delays, etc.), a drawing depicting the placement of the charges, size of the safety radius and how it will be marked (also depicted on a map), tide tables for the blasting event(s), and estimates of times and days for blasting events (with an understanding this is an estimate, and may change due to weather, equipment, etc). This material should be recorded by the Protected Species

Observer lead for each blasting event and included in the final report to the Permittee in an appendix.

For each explosive charge placed, three zones will be calculated, denoted on monitoring reports and provided to protected species observers before each blast for incorporation in the watch plan for each planned detonation. These zones are:

i. *Danger/Exclusion Zone*: The distance in feet from blast (radius) = (260 $w^{1/3}$) + 500 feet. The "w" is the maximum charge weight (in tetryl or TNT pounds) per delay of an individual confined shot. Detonation will not occur if a marine animal is known to be (or based on previous sightings, may be) within this circular area around the detonation site.

ii. *Safety Zone*: The distance in feet from blast (radius) = (520 $w^{1/3}$). The "w" is the maximum charge weight (in tetryl or TNT pounds) per delay of an individual confined shot. Any protected marine animal within this circular area around the Danger/Exclusion Zone must be monitored continuously. Detonation should not occur if a marine animal appears to be traveling towards and nears the Danger/Exclusion Zone and detonation site during countdown.

iii. *Watch Zone*: Three times the radius of the Danger/Exclusion Zone. This is the minimum watch distance to insure that animals entering or traveling close to the exclusion and safety zones are spotted and appropriate actions can be implemented before or as the animal enters the exclusion zone (i.e., a delay in blasting activities).

b. Watch Plan:

i. A list of the observers and their contact information, their qualifications, and positions for the watch, including a map depicting the proposed locations for boat or land-based observers must be included in the Blast and Watch Plan. Qualified observers must have significant prior on the job experience observing for protected marine species (including manatees, marine turtles, dolphins, etc.) during previous in-water blasting events where the blasting activities were similar in nature to this project. Each observer's past experience must: 1) be in the same observer position proposed for this project; 2) include experience working as part of an observation team during an in-water blasting project; and 3) have extensive manatee or marine turtle observation experience during previous dredging or blasting projects and/or during manatee or marine turtle research studies.

ii. A formal coordination meeting shall be held at least two days prior to the first blast event. Attendants will include the observers in the watch program, construction contractors, demolition subcontractors, and other interested parties, such as the U.S. Coast Guard, FDOT, FWC, FWS, and DEP. The construction contractors, demolition subcontractors and observers will present the protocol and logistics of the project.

iii. The watch program shall consist of a minimum of six observers and one coordinator. There should be a minimum of one aerial survey observer, with the other observers elevated in positions on boats or on land, depending upon the specific project. Each observer shall be equipped with a two-way radio that shall be dedicated exclusively to the watch. Extra radios should be available in case of failures. All of the observers shall be in close communication with the blasting subcontractor in order to halt the blast event if the need arises. If all observers do not have working radios and cannot contact the primary observer and the blasting subcontractor during the pre-blast watch, the blast shall be postponed until all observers are in radio contact. Observers shall also be equipped with polarized sunglasses, binoculars, a red flag for backup visual communication, and a sighting log with a map to record sightings. All blasting events will be weather dependent. Climatic conditions must be suitable for optimal viewing conditions, determined by the observers.

iv. The watch program shall include a continuous aerial survey to be conducted by aircraft, as approved by the FAA. The blasting event shall be halted if an animal(s) is spotted within the Danger/Exclusion Zone. An "all-clear" signal must be obtained from the aerial observer before detonation can occur. The blasting event shall be halted immediately upon request of any of the observers. If animals are sighted in the Danger/Exclusion Zone, the blast event shall not take place until the animal(s) moves out of the area under its own volition. Animals shall not be herded away or harassed into leaving. Specifically, the animals must not be intentionally approached by project watercraft. If the animal(s) is not sighted a second time, the event may resume 30 minutes after the last sighting.

v. The watch program shall begin at least one hour prior to the scheduled start of blasting to identify the possible presence of manatees, dolphins, marine turtles, crocodiles or whales (in the nearshore and offshore areas). The watch program shall continue until at least one half-hour after detonations are complete.

vi. If any one of the blast or watch conditions is not met prior to or during the blasting, the watch observers shall have the authority to terminate the blasting event, until resolution can be reached with the Contracting Officer. The Contracting Officer or their representative will contact FWC, FWS and NMFS, as appropriate.

vii. If an injured or dead marine mammal or marine reptile is sighted after the blast event, the observers shall maintain contact with the injured or dead animal until authorities arrive. The observer coordinator shall contact the Contracting Officer, or their representative, who will contact the resource agencies.

REPORTS

44. Turbidity Monitoring Reports. All turbidity monitoring data shall be submitted within one week of analysis, along with documents containing the following information:

a. time of day samples were taken;

b. dates of sampling and analysis;

c. depth of water body;

d. depth of each sample;

e. antecedent weather conditions, including wind direction and velocity;

f. tidal stage and direction of flow;

g. water temperature;

h. a map indicating the sampling locations, dredging and discharge locations, and direction of flow;

i. a statement describing the methods used in collection, handling, storage and analysis of the samples;

j. a statement by the individual responsible for implementation of the sampling program concerning the authenticity, precision, limits of detection, calibration of the meter and accuracy of the data;

k. When samples cannot be collected due to unsafe conditions, include an explanation in the report. If unable to collect samples due to severe weather

conditions, include a copy of a current report from a reliable, independent source, such as an online weather service.

Monitoring reports shall be submitted by email to the JCP Compliance Officer (JCPCompliance@dep.state.fl.us), the Biscayne Bay Aquatic Preserve, and the Department's Southeast District office. In the subject line of the reports, include the Project Name, Permit Number and the dates of the monitoring interval. Failure to submit reports in a timely manner constitutes grounds for revocation of the permit. When submitting this information to the Department, on the cover page to the submittal and at the top of each page, state: "This information is provided in partial fulfillment of the turbidity monitoring requirements in Permit No. 0305721-001-BI, for the Miami Harbor Phase III Federal Channel Expansion project."

45. The recorded vessel track lines shall be made available upon request by the Department.

46. Progress reports for the project shall be submitted to the Department beginning 60 days after issuance of this permit and every 3 months during construction until construction of the permitted project is completed. Progress reports shall be submitted to the Department even if there is no ongoing construction. Reports shall include the current project status and the construction schedule for the following six months.

In addition, the report shall include the following information:

a. The permit number (**0305721-001-BI**), project name (**Miami Harbor Phase III Federal Channel Expansion**), reference to this Specific Condition and date permitted activity was begun. If work has not begun on-site, please indicate same;

b. Brief description and extent of the work (e.g., percentage of dredging) completed since the previous report or since the permit was issued. Show on copies of the permit drawings those areas where work has been completed;

c. Brief description and extent of the work anticipated in the next six months. Indicate on copies of the permit drawings those areas where it is anticipated that work will be done; and

d. This report shall include on the first page, just below the title, the certification of the following statement by the individual who supervised preparation of the report: "This report represents a true and accurate description of the activities conducted during the six month period covered by this report."

e. A list of reportable incidences that occurred during the 3 month reporting period.

POST-CONSTRUCTION

47. In accordance with General Condition No. 12, the Permittee shall include a written statement of completion. The following information shall be included:

    a. The permit number (**0305721-001-BI**) and project name (**Miami Harbor Phase III Federal Channel Expansion)**

    b. The specific location of the dredging and mitigation activities performed;

    c. The date on which dredging and mitigation activities began and the date of completion;

    d. A table identifying any violations of turbidity standards that occurred during dredging or disposal (including mitigation activities), the probable causes of the violations, and corrective measures taken to reduce turbidity;

    e. A summary of all intermediate turbidity monitoring at 150, 300 and 500 meters downcurrent from the source of turbidity. This shall include the measured turbidity level at the surface and mid-depth, the corresponding background levels, and the net turbidity levels. The report shall note all occasions where the net turbidity levels exceeded the indicated turbidity standard for the sampling site (i.e., 9 NTUs in OFW seagrass mitigation site and 13 NTUs elsewhere in the OFW, and 29 NTUs outside of OFW);

    f. The quantity of material dredged and deposited in mitigation sites; and,

    g. A summary of all occurrences where final dredged depth was deeper than the maximum allowable dredge depths outlined in the Activity Description, including locations, via provision of a post-construction survey, color-coded to annotate exceedances beyond allowances provided in the U.S. Army Engineer Research and Development Center Technical Note EEDP-04-37.

END OF SPECIFIC CONDITIONS

Executed in Tallahassee, Florida.