

Appendix D
404(b)(1) Evaluation

SFWMD Section 203 Everglades Agricultural Area Southern Reservoir and Stormwater Treatment Area

CLEAN WATER ACT SECTION 404(B)(1) EVALUATION

PREFACE

This document is a programmatic Section 404(b)(1) Evaluation for the SFWMD Section 203 Report. As such, it addresses, at a general level, the potential environmental effects of the wetland and aquatic ecosystem alterations expected from dredge and fill and the construction of the structural components of the recommended plan. Subsequent site-specific Section 404(b)(1) evaluations are intended to be done for individual project components, or groups thereof, in sufficient detail for final decision making and for full compliance with the Section 404(b)(1) guidelines and NEPA requirements. This 404(b)(1) evaluation should be sufficient to qualify for, and in the event that subsequent decisions render the project in compliance with, coverage under Section 404(r) of the Clean Water Act and exempt from State and Tribal WQC.

Location

The study area for the SFWMD Section 203 Report encompasses the Northern Estuaries (St. Lucie River and Estuary [including Indian River Lagoon] and the Caloosahatchee River and Estuary), Lake Okeechobee, a portion of the EAA, the Water Conservation Areas (WCA), Everglades National Park (ENP), and the Southern Estuaries (specifically focused on Florida Bay).

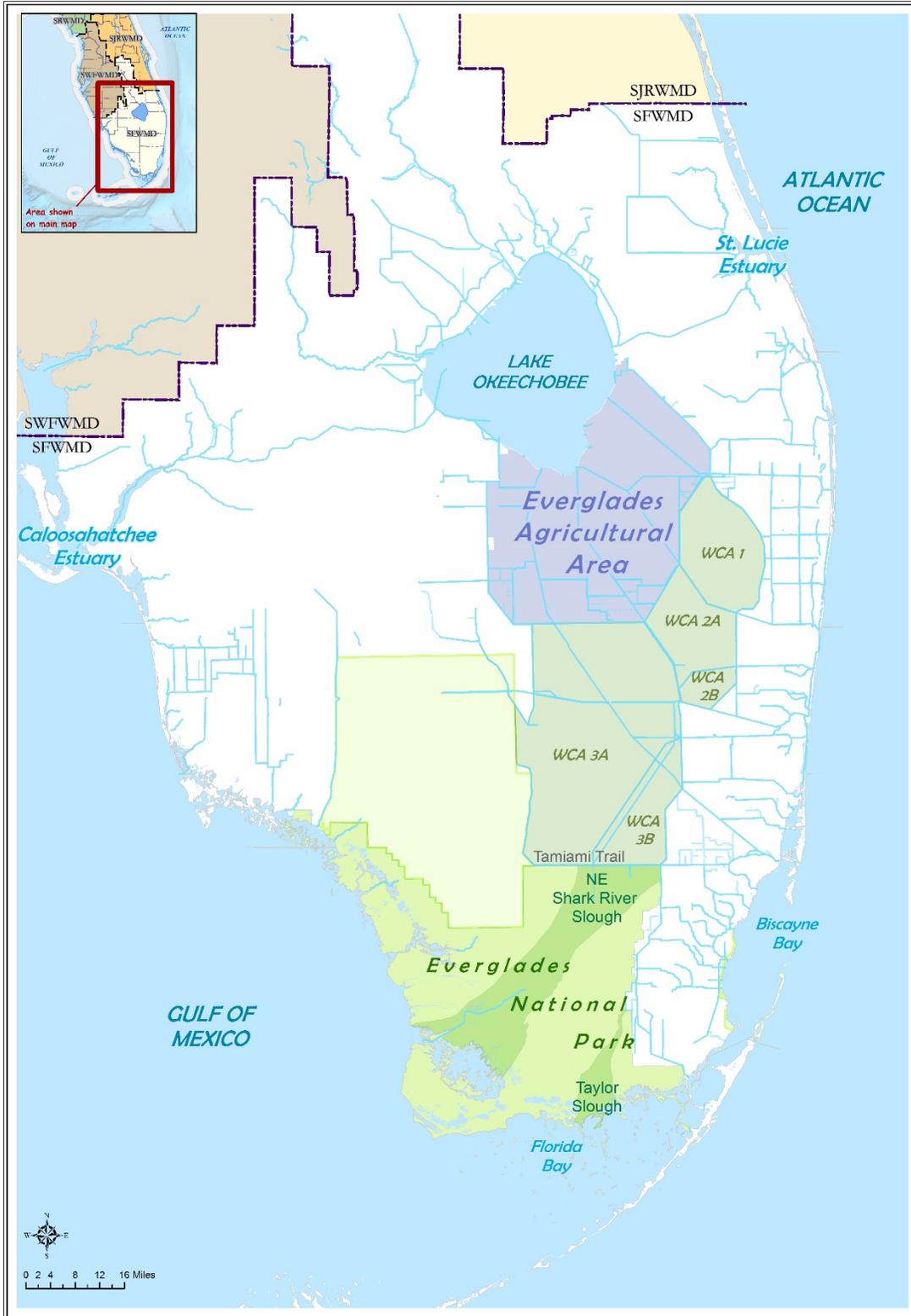


Figure 1. Project Area Map

Project Description

Plan Features

The components of the SFWMD Section 203 Preferred Alternative include improved conveyance, storage reservoir, and stormwater treatment area (STA) components along with water control structures and a pump station.

Storage and treatment of new water will be possible with the construction of a 10,500-acre, above-ground storage reservoir and 6,500-acre STA. The reservoir will accept a portion of the Lake Okeechobee water currently discharged to the estuaries. This Lake Okeechobee water is diverted to the A-2 Reservoir via the North New River and Miami Canals. The preliminary design includes an intake canal along the northern boundary of the parcels between the two canals for operational flexibility.

While some refinements were made within the operational flexibility available in the 2008 Lake Okeechobee Regulation Schedule (LORS), assumptions ultimately extended beyond this flexibility due to adjustments made to the tributary/climatological classifications. Additional information and documentation of these assumptions are found in the **Appendix A** (Engineering) of the SFWMD Section 203 Report.

Authority and Purpose

The CERP was approved in Section 601 of Water Resources Development Act (WRDA) of 2000. The authority for the preparation of SFWMD Section 203 Report is contained in Section 601(d) of the WRDA of 2000. The USACE and the SFWMD have executed a design agreement for the design of elements of the CERP and South Florida Ecosystem Restoration project (Design Agreement, May 2000). The direction and guidance for the development of CEPP and the SFWMD Section 203 Report are contained within the CERP Master Program Management Plan (MPMP), which was developed and approved by USACE and SFWMD for the purposes of describing the framework and processes to be used for managing and monitoring implementation of CERP. This SFWMD Section 203 Report has been prepared by the SFWMD for submittal to the Assistant Secretary of the Army for Civil Works for review, approval, and subsequent transmittal to Congress for authorization under Section 203 of the WRDA of 1986, as amended. Pertinent background information on the CERP and the CEPP, which represents a significant increment of CERP implementation, is provided in **Section 1.0** of the Main Report.

The Central and Southern Florida (C&SF) Flood Control Project, as constructed, had unintended adverse impacts to the Greater Everglades including the Northern Estuaries, WCA 3, ENP, and Florida Bay. Historically, freshwater flowed southward from Lake Okeechobee to Florida Bay from surface (sloughs, transverse glades, and overland from through wetlands) and groundwater sources and resulted in a mosaic of vegetative communities as well as a narrower range of salinity fluctuations in Florida Bay than exist today. While historic conditions sustained healthy and extensive ecological communities (ridge and slough, wet prairies, tree islands, sawgrass prairies, mangrove communities, and seagrass beds), these communities have been degraded under the managed system. The purpose of SFWMD Section 203 Report is to improve the quantity, quality, timing, and distribution of water flows to the central Everglades (WCA 3 and ENP).

General Characteristics of Material

The soils in the Everglades are primarily composed of peats and mucks. Deep, clean sands characterize the area east of the Everglades and south of Lake Okeechobee, while wet, gray or grayish-brown, sandy

soils underlain by sandy clay cover the area west of the Everglades. The peat and muck soils, which are dark brown to nearly black, cover approximately 90 percent of the area being considered in the study area. They were formed in marshes or swamps by the partial decay of plant materials, with some admixture of mineral soil in the case of muck. Peat, by definition, consists of 65 percent or more organic material with relatively little mineral matter. Muck, on the other hand, consists of 25 to 65 percent plant material mixed with sand, silt, and clay. The peat and muck soils may differ from each other in the kind of plant material that they contain, in the corresponding depths, and/or in the nature of the underlying material. The peat and muck may rest directly on limestone or on an intermediate layer of sand or marl. The highly organic soils have been divided into four types: Okeechobee muck, Okeelanta peaty muck, Everglades' peaty muck, and Everglades' peat. A fifth type of organic soil, which is not extensive in the area, is Loxahatchee peat. Where peat is encountered in the borrow area, it would be removed and not used as construction material.

The material may be reused or would be disposed of offsite in a Class 1 landfill. Soil testing would be conducted to better define the soil characteristics and as a result of that soil testing, other disposal options may be pursued.

Timing and Duration of Discharge

Installation timing of the project features has yet to be determined. The time and duration of discharge would be further defined during the detailed design phase.

Substrate Elevation and Type

The natural topography of the area is nearly flat with slopes less than 2 percent, with the exception of the unnatural features (e.g., canals and levee; see **Table C.4-1**).

Sediment Type

The substrate at the installation site, including EAA, the WCAs, and ENP, is calcium carbonate limestone rock overlain with peat and muck soils.

Physical Effects on Benthos

No adverse impacts to benthic organisms are anticipated other than displacement of those organisms in the construction footprint of the proposed project. Highly prolific organisms are expected to quickly re-establish in the natural wetlands restored through improved hydrology.

Water Circulation, Fluctuation, and Salinity Determination

An ecological monitoring plan (**Annex D**) has been developed to monitor hydrology, water quality, and associated changes within the project area.

Suspended Particulate/Turbidity Determinations

Best management practices would be used to minimize the suspension and transport of soils, levee materials, and roadway materials into water adjacent to or downstream of the construction area including use of sediment controls, turbidity screens, or sediment blockages for adjacent wetlands.

In general, any short-term impacts to water quality associated with construction of the project would be ameliorated by construction sequencing, best management practices for erosion and sedimentation control, and monitoring during construction.

Contamination Determinations

From the 1920s through the 1960s, most of the land parcels incorporated in the project footprint were cultivated for agricultural use. A few parcels continue to be farmed; however, crops and/or cultivation practices have changed dramatically. Residual pesticide contamination associated with past and present crop production can be detected in the soils on many of the parcels; albeit, at concentrations that are not likely to present unacceptable risks to human health or environmental receptors. For parcels that are frequently inundated under present hydrologic conditions, the proposed project is not likely to significantly increase the risk of environmental harm associated with the fate and transport of the residual contamination. For parcels that are not frequently inundated under present hydrologic conditions, the proposed project may increase the risk of environmental harm associated with the fate and transport of residual contamination. Additional HTRW investigations may be conducted to determine what project top soils might require isolation (by encapsulating in levee berms) to minimize the risk of contaminant bioaccumulation or mobilization.

Aquatic Ecosystem and Organism Determinations

No long-term adverse impacts on aquatic organisms are anticipated. Wetland and estuarine ecosystems are expected to greatly improve because of implementation of the SFWMD Section 203 Preferred Alternative. The proposed project is not expected to cause or contribute to violations of State Water Quality Standards, jeopardize the existence of any federally endangered or threatened species, nor impact a marine sanctuary. No significant degradation is expected, and all appropriate and practicable steps would be taken to minimize impacts.

Effects on Plankton

No adverse impacts to plankton are anticipated. Concentration of freshwater diatoms should increase, at a minimum, in a narrow zone associated with water deliveries into ENP.

Effects on Benthos

No adverse impacts to benthic organisms are anticipated other than displacement of those organisms in the construction footprint of the proposed project. Reduction of freshwater flows to the Caloosahatchee Estuary and the St. Lucie Estuary and an increase of freshwater flows to Florida Bay would provide improved habitat for the benthos.

Effects on Nekton

There should be no adverse impacts to freshwater swimming aquatic organisms, including fishes, during construction. Additionally, no adverse impacts are expected downstream in the waters of Florida Bay and the adjacent coastline. Estuarine fish species most likely to occur in these areas include the small forage species, such as killifish (*Cyprinodon* spp. and *Fundulus* spp.), mosquito fish (*Gambusia affinis*), juvenile sciaenids (*Leiostomus* spp.), silversides (*Atherinidae*), and mullets (*Mugil* spp.). Larger secondary consumers include gray snapper (*Lutjanus griesus*), tarpon (*Megalops atlantica*), snook (*Centropomus* spp.), red drum (*Sciaenops ocellatus*), and spotted seatrout (*Cynoscion nebulosus*). Freshwater deliveries through ENP would provide improved habitat and nursery opportunities for fishes in downstream estuaries connecting coastal wetlands to the bay.

Effects on Aquatic Food Web

Periphyton forms the base of the food web within the project area. Implementation of the project is

expected to increase periphyton mat biomass and productivity throughout the site as well as freshwater diatoms. Other than minor, temporary impacts within the construction footprint of the proposed spreader channels, no adverse impacts to the aquatic food web are anticipated.

EFFECTS ON AQUATIC SITES

Hardground and Coral Reef Communities

There are no hardground or coral reef communities located within the proposed project site or the nearshore waters affected by the project. Corals found within the waters of Biscayne Bay are outside of the area of potential effect.

Sanctuaries and Refuges

Biscayne National Park and a portion of ENP are downstream of the project area and are recognized as tropical marine environments of national significance well known for their productive reef ecosystems that play a critical role in the dynamics of the larger Florida Keys reef ecosystem. The project is intended to improve the quantity, timing, and distribution of water delivered to Florida Bay and should not have a negative effect on the sanctuaries and refuges.

Wetlands

The dominant vegetation community in the region is a matrix of sawgrass prairie with tree islands. At the lowest elevations near the coast, mangroves replace the freshwater wetlands. The transition zone between the mangroves and the freshwater prairie is a needle rush-salt grass zone on the freshwater side and stunted scrub mangrove on the coastal side. As a result of the project, approximately 233 acres of wetlands, currently in agriculture production, would be removed by construction and excavation activities. This loss is considered minimal and is not anticipated to have any adverse effects. The proposed project is anticipated to provide positive ecological benefits, including improving hydroperiods and hydropatterns in WCA 3A and ENP, by improving the quantity, timing, and distribution of water delivered to the downstream estuaries, Florida Bay, and other receiving waters.

Mud Flats

There are no mud flats within the construction footprint or areas impacted by the proposed project.

Vegetated Shallows

Submerged aquatic vegetation (SAV) is present throughout the nearshore waters. The trend shows the following species in order from the shoreline to the deeper waters: widgeon grass (*Ruppia maritima*), turtle grass (*Thalassia testudinum*), manatee grass (*Syringodium filiforme*), shoal grass (*Halodule wrightii*), and Johnsons seagrass (*Halophila johnsonii*). Reduction of freshwater flows to the Caloosahatchee Estuary and the St. Lucie Estuary and an increase of freshwater flows to Florida Bay would provide improvements to SAV.

Riffle and Pool Complexes

There are no riffle or pool complexes within the project footprint and none should be impacted by the proposed project.

Threatened and Endangered Species

There are 32 federally listed threatened and endangered species potentially present in the project area. The BA was submitted to FWS on May 1, 2018 and is included within **Appendix A** to document potential effects to threatened and endangered species.

Determination of Compliance with Applicable Water Quality Standards

SFWMD Section 203 Report will comply with water quality standards applicable to the project and adjacent waters. Proposed features are located in and adjacent to waters designated as Class III by the State of Florida. In accordance with Florida Administrative Code (F.A.C.) Rule 62-302 (“Surface Water Quality Standards”), the use classification of Class III waters is “Recreation, Propagation, and Maintenance of a Healthy, Well- Balanced Population of Fish and Wildlife.” In addition to the minimum and general criteria for surface waters found in Section 62-302.500(1) F.A.C., there are numerous water quality criteria for specific parameters for Class III waters listed in Section 62-302.530 F.A.C. Although the SFWMD Section 203 Preferred Alternative is not expected to affect most of the parameters listed in this rule, certain parameters (e.g., turbidity, dissolved oxygen and nutrients) listed in the criteria may be affected by construction and operations activities. The construction and operation of the proposed project components would comply with Federal and State water quality standards.

POTENTIAL EFFECTS ON HUMAN USE CHARACTERISTICS

Municipal and Private Water Supply

No municipal or private water supplies would be adversely impacted by the implementation of the Project. Refer to **Section 4** of the Main Report and **Appendix C.2.1** for additional information pertaining to SFWMD Section 203 Report water supply analyses.

Recreational and Commercial Fisheries

The proposed project would benefit recreational and commercial fisheries through salinity improvements within the Northern and Southern Estuaries.

Water-Related Recreation

Water-related recreation would be improved by project features and the associated recreation plan. Further detail is included in **Appendix F**.

Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves

The project would enhance environmental conditions at these types of sites within the project area. For more information, refer to **Section C.4.37.3.6.5.2, Sanctuaries and Refuges**.

Essential Fish Habitat

Essential Fish Habitat in the Area

The project area includes two distinct regional estuarine and nearshore coastal systems: the Southern Estuaries, including Biscayne Bay and Florida Bay, and the Northern Estuaries, including the Caloosahatchee River and the St. Lucie Estuary.

The Southern Estuaries, a shallow estuarine system (average depth less than 3 feet), comprise Biscayne National Park and a large portion of ENP. Florida Bay is the main receiving water of the Greater Everglades, heavily influenced by changes in timing, distribution, and quantity of freshwater flows into the Southern Estuaries. Lake Okeechobee discharges into the two northern estuaries. The St. Lucie Canal feeds into the St. Lucie Estuary, and the Caloosahatchee Canal/River feeds into the Caloosahatchee Estuary to the west.

Biscayne Bay and Florida Bay

The Southern Estuaries contain EFH for corals, coral reef and live bottom habitat, red drum (*Sciaenops*

ocellatus), penaeid shrimps (*Penaeus* spp.), spiny lobster (*Panulirus argus*), other coastal migratory pelagic species, and the snapper-grouper complex. Species generally present in the southern estuaries region include brown shrimp (*Penaeus aztecus*), pink shrimp (*Penaeus duorarum*), white shrimp (*Penaeus* sp.), spiny lobster, stone crab (*Menippe mercenaria*), gulf stone crab, red drum, Spanish mackerel (*Scomberomorus maculatus*), and gray snapper (*Lutjanus griseus*). EFH in the Southern Estuaries are composed of seagrasses, estuarine mangroves, intertidal flats, the estuarine water column, live/hard bottoms, and coral reefs.

Caloosahatchee River

The Caloosahatchee River Estuary contains EFH for juvenile brown shrimp, juvenile gray snapper (*Lutjanus griseus*), smalltooth sawfish (*Pristia pectinata*), juvenile pink shrimp, adult and juvenile red drum, adult and juvenile Spanish mackerel, and juvenile stone crab. Downstream habitats include oyster reefs and seagrass beds (submerged aquatic vegetation).

St. Lucie Estuary

The proposed project is within the jurisdiction of the South Atlantic Fishery Management Council (SAFMC) and is located in areas designated EFH for wormrock, live bottom habitat, the American oyster (*Crassostrea virginica*), pink shrimp, white shrimp, brown shrimp, Florida red drum, grouper (*Epinephelus* spp.), gray snapper (*Lutjanus griseus*), white grunt (*Haemulon plumieri*), red porgy (*Pagrus pagrus*), spiny lobster, and the snapper-grouper complex. In addition, the nearshore hardbottom habitat outside of the St. Lucie Estuary is designated Essential Fish Habitat-Habitat Areas of Special Concern (EFH-HAPC) for the snapper-grouper complex.

ASSESSMENT OF EFFECTS ON HARDGROUND AND CORAL REEF COMMUNITIES

This project is not expected to affect coral reef or hardbottom communities in the project area. There are no coral reefs or hardbottom communities located within the proposed project site or the nearshore waters affected by the project. Corals found within Florida Bay and Biscayne Bay are outside the area of potential effect.

Assessment of Effects on Sanctuaries and Refuges

Biscayne National Park and a portion of ENP are downstream of the project area and are recognized as tropical marine environments of national significance well known for their productive reef ecosystems that play a critical role in the dynamics of the larger Florida Keys reef ecosystem. The proposed project is intended to improve the quantity, timing, and distribution of water delivered to Florida Bay.

Assessment of Effects on Wetlands

The dominant vegetation community in the region is a matrix of sawgrass prairie with tree islands. At the lowest elevations near the coast, mangroves replace the freshwater wetlands. The transition zone between the mangroves and the freshwater prairie is a needle rush-salt grass zone on the freshwater side and stunted scrub mangrove on the coastal side. As a result of the project approximately 233 acres of wetlands, currently in agriculture production, would be removed by construction and excavation activities. This loss is considered minimal and is not anticipated to have any adverse effects. The proposed project is anticipated to provide positive ecological benefits, including improving hydroperiods and hydropatterns in ENP by improving the quantity, timing, and distribution of water delivered to the downstream estuaries, Florida Bay, and other receiving waters.

Assessment of Effects on Mud Flats

There are no mud flats within the construction footprint or areas impacted by the project.

Assessment of Effects on Vegetated Shallows

SAV is present throughout the nearshore waters. The trend shows the following species in order from the shoreline to the deeper waters: widgeon grass (*Ruppia maritima*), turtle grass (*Thalassia testudinum*), manatee grass (*Syringodium filiforme*), shoal grass (*Halodule wrightii*), and Johnsons seagrass (*Halophila johnsonii*). Reduction of freshwater flows to the Caloosahatchee Estuary and the St. Lucie Estuary and an increase of freshwater flows to Florida Bay would provide improvements to SAV. Without operational changes and/or active pumping, the project is not anticipated to have any effect on SAV.

Assessment of Effects on Riffle and Pool Complexes

There are no riffle or pool complexes within the project footprint and none should be impacted by the project.

Assessment of Effects on Plankton

No adverse impacts to plankton are anticipated. Concentration of freshwater diatoms should increase, at a minimum, in a narrow zone associated with water deliveries into ENP.

Assessment of Effects on Benthos

No adverse impacts to benthic organisms are anticipated other than displacement of those organisms in the construction footprint of the project.

Assessment of Effects on Nekton

There should be no adverse impacts to freshwater swimming aquatic organisms including fishes during construction. Additionally, no adverse impacts are expected downstream in the waters of Florida Bay and the adjacent coastline. Estuarine fish species most likely to occur in these areas include the small forage species such as killifish (*Cyprinodon* spp. and *Fundulus* spp.), mosquito fish (*Gambusia affinis*), juvenile sciaenids (*Leiostomus* spp.), silversides (*Atherinidae*), and mullets (*Mugil* spp.). Larger secondary consumers include gray snapper (*Lutjanus griesus*), tarpon (*Megalops atlantica*), snook (*Centropomus* spp.), red drum (*Sciaenops ocellatus*), and spotted seatrout (*Cynoscion nebulosus*). Freshwater deliveries through ENP would provide improved habitat and nursery opportunities for fishes in downstream estuaries connecting coastal wetlands to the bay.

Determination of Effects on Essential Fish Habitat

The overall benefit to the regional system is expected to be far greater than the localized adverse effects. The restoration of hydrology of the Greater Everglades ecosystem and the increase in spatial extent of protected wetland acreage in the region would produce extensive cumulative beneficial effects. These beneficial effects are expected to substantially outweigh the cumulative adverse effects produced by the aquatic ecosystem alterations that may be necessary to construct some of the project components.

Determination of Cumulative Effects on the Aquatic Ecosystem

The overall benefit to the regional system is expected to be far greater than the localized adverse effects. The hydrologic restoration of the Greater Everglades ecosystem and the increase in spatial extent of protected wetland acreage in the region would produce extensive cumulative beneficial effects. These beneficial effects are expected to substantially outweigh the cumulative adverse effects produced by the aquatic ecosystem alterations that may be necessary to construct some of the project features.

Determination of Secondary Effects on the Aquatic Ecosystem

No adverse secondary impacts on the aquatic ecosystem would occur as a result of the construction. During construction, the sites would be contained with sedimentation barriers. Erosion would be controlled by appropriate erosion control techniques. Sedimentation would be controlled during construction. An ecological and water quality monitoring plan would be implemented during and after construction and specific environmental commitments, engineering and design commitments, and operational commitments would be incorporated to avoid, minimize, and/or mitigate for adverse effects.

Findings of Compliance or Non-Compliance with the Restrictions on Discharge

No significant adaptations of the guidelines were made relative to this evaluation.

At the time of the project planning phase, no practicable alternatives exist that meet the study objectives involving discharge of some small fill into waters of the United States.

At this time, no practicable alternatives exist that have less adverse impact on the aquatic ecosystem without presenting other significant adverse environmental consequences. The alternatives all have overwhelming beneficial impacts.

The discharge of fill materials is not anticipated to cause or contribute to violations of any applicable State water quality standards for Class III waters or Outstanding Florida Waters where applicable. The discharge operation is not anticipated to violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.

The placement of fill materials in the project area is not anticipated to jeopardize the continued existence of any species listed as threatened and endangered or result in the likelihood of destruction or adverse modification of any critical habitat as specified by the Endangered Species Act of 1973, as amended.

The placement of fill material is not anticipated to result in significant, adverse effects on human health and welfare, including municipal and private water supplies; recreational and commercial fishing; and plankton, fish, shellfish, wildlife, and special aquatic sites. The life stages of aquatic species and other wildlife is not anticipated to be adversely affected. Significant adverse effects on aquatic ecosystem diversity, productivity, and stability and recreational, aesthetic, and economic values are not anticipated.

Based on the guidelines, the proposed discharge site for the discharge of fill and/or dredged material is specified as complying with the requirements of these guidelines.