

## **APPENDIX I**

### **Section 404(b) Evaluation**



## **APPENDIX I- SECTION 404(b) EVALUATION**

### **ENHANCE ENVIRONMENT OF THE UPPER ST. JOHNS RIVER BASIN UPPER ST. JOHNS RIVER BASIN AND RELATED AREAS SOUTHEAST FLORIDA, BREVARD COUNTY**

#### **I. Project Description**

a. Location. The proposed work will be performed the Upper St. Johns River Basin located near the coast in southeast Florida. Project features considered by this document are located in Brevard County between highway U.S. 192 and the Indian River County line (see figure 1, project location and plan view).

b. General Description. The proposed plan calls for Improvement of water quality discharged from SJWMA. Improved quality of water discharged downstream to Lake Washington Fewest acres subject to soil oxidation in TFMCA. Less chance of dissolved oxygen sags in the dry season. Greater surface area for mixing reduces severity of dissolved oxygen sags in TFMCA. Decrease in chlorides discharged from the basin to Lake Washington. Deeper water habitat provides for increased nutrient retention and protects wetlands in TFMCA.

c. Authority and Purpose. The Upper St. Johns River basin is part of the overall project for Central and Southern Florida which was first authorized by the Flood Control Act of 1948 approved 30 June 1948 (Public Law 858, 80 Congress, 2<sup>nd</sup> Session)+ That authorization included most of the works in the southern third of the state, but did not include any works in the Upper St. Johns River Basin. Remaining works of the Comprehensive Plan for Flood Control and other purposes for Central and Southern Florida, including all works in the Upper St. Johns River Basin, were authorized by the Flood Control Act approved 3 September 1954 (Public Law 780, 83<sup>rd</sup> Congress, 2<sup>nd</sup> Session) and are presented in House Document 643, 80<sup>th</sup> Congress, 2<sup>nd</sup> Session.

d. General Description of Fill Material.

(1) General Characteristics of Material. It is probable that the filling material to be used is the type of soil named Floridiana or Canova Mucky Peat.

(2) Quantity of Material. The quantity of filling material is approximated to be 357,012.9 cubic yards.

(3) Source of Material. The source material will be obtained from the same 257,760.3-cubic yard canal excavation (to over excavated, if necessary to procure enough material) that will take place during construction of the levee.

e. Description of the proposed Discharge Site. **Non-Applicable, since dredging will not occur at the site. All excavate will be used to construct the projected levee.**

f. Description of Disposal Method. **Not-Applicable, since dredging will not occur at the site. All excavate will be used to construct the projected levee.**

## II. Factual Determinations

a. Physical Substrate Determinations. The soils that make up TFMCA and SJMCA are poorly to very poorly drained hydric and facultative soils (Figure 5; USDA 1974). Hydric soils are defined as those soils that are saturated or flooded long enough during the growing season to favor growth and regeneration of wetland vegetation. Hydric soils can be either organic or mineral. Facultative soils are intermediate between hydric and upland soils and sometimes exhibit the characteristics of hydric soils. Approximately 90% of the area is comprised of hydric soils, primarily Monteverde and Micco peat. Monteverde and Micco peat are poorly drained, highly organic soils that generally occur in freshwater marshes and swamps. Natural water table conditions are

generally within a depth of 10 inches of the soil surface for 6 to 12 months a year and between 10 and 40 inches for the rest of the year (USDA 1974). Water can stand on the surface for 6 months each year.

Primary facultative soils occurring in the area are Riviera and Winder loamy sand. Riviera and Winder sand are classified as poorly drained sandy soils that occur on broad low flats and in sloughs, depressions and cypress ponds. Organic content of these soils is generally low. The natural water table is generally within a depth of 10 inches for 1 to 6 months in most years and typically between 10 and 40 inches the rest of the year (USDA 1974). These soils are generally flooded for up to 7 days in 1 to 3 months of each year.

(1) Substrate Elevation and Slope. Topography in the TFMCA is gently sloping with a gradient of approximately 8 inches per mile. Ground elevations in the TFMCA generally range from 12 to 20 ft NGVD (National Geodetic Vertical Datum) and there is a downward elevation gradient from south to north of approximately 8.5 inches (0.7 ft.) per mile. A comparison of survey data from 1954 and 1998 indicates that soils in the TFMCA have subsided between 2 and 5 ft. This soil loss is due primarily due to the oxidation of the highly organic peat soils that underlie most of the TFMCA after they were drained. Ground elevations in the adjacent SJMCA generally range from 14 to 23 ft NGVD and there is also a downward slope from south to north of approximately 8.8 inches (0.74 ft.) per mile. The elevation gradient in SJMCA is not evenly sloping but has a relatively steep gradient between the 19-foot and 21-foot contours. This steep gradient occurs in the most constricted portion of the SJMCA where the marsh width spans less than one mile. Ground elevations in TFMCA, on average, are between 2 and 4 ft. lower than ground elevations in the immediately adjacent areas of SJMCA

(2) Sediment Type. Sediment can be classified within the following types: Canova Mucky Peat, Riviera Sand, Micco Mucky Peat, Floridiana, and Chobee & Felda Soils.

(3) Fill Material Movement. Some of the excavation material in addition to new filling material will be used to construct the levee.

(4) Physical Effects on Benthos. Phosphorous concentration is the primary water quality variable of concern. One goal of this project is to meet or exceed Class I water quality standards for the discharge of phosphorous as established by the Florida Department of Environmental Protection. These standards specify that nutrient releases into Class I water bodies must be at level such that they will not cause an "imbalance to native aquatic flora and fauna".

b. Water Circulation, Fluctuation and Salinity Determination.

(1) Water Column Effects. Key parameters of concern were nutrients, primarily phosphorous, major mineral concentrations, and dissolved oxygen (Lowe, et. al. 1984; FDEP 1996).

Mean total phosphorous concentrations ranged from 0.11 mg/l upstream of S-96C (the outflow from the BCMCA) to 0.61 mg/l in the southern section of TFMCA (Table 11). Total Kjeldahl nitrogen values at these two sites ranged from 1.3 mg/l to 2.9 mg/l, respectively and also encompassed the entire range of values recorded at all sites. The high nutrient level in the southern section of TFMCA reflects nutrient release from the intermittently flooded soils, as there is no direct water inflow to the area except for rainfall. Levels are elevated because the area was intensively farmed for row-crops prior to being purchased by the District. In 1984, water discharge from this area was also reported to have the highest nutrient levels of any site measured in the basin (Lowe et al. 1984). With more permanent inundation, phosphorous levels in the water column in this area are expected to drop to levels seen in the middle section of TFMCA (0.12 mg/l), an area that was also intensively farmed, but has been subjected to much longer hydroperiods.

(2) Current Patterns and Circulation. Under the Three Forks diversion alternative, high nutrient laden water from the St. Johns River Water Management Area in Indian River County will be transported approximately 10 miles into the TFMCA in Brevard County. It will then back flow into the marsh area, and be discharged into the St. Johns River system. The primary purpose of this diversion is to achieve flood control objectives for agricultural lands in Indian River County. Water, which drains into the St. Johns River system from the St. Johns River Water Management District Upper Basin project, comes to Lake Washington. Lake Washington is the source of public water supply for over 100,000 residents in South Brevard.

(3) Normal Water Level Fluctuations and Salinity Gradients. Timing of fluctuation should be such that minimum water levels occur between April 1 and June 30 in more than 50 percent of the years and maximum water levels occur between September 1 and November 31 in more than 50 percent of the years. This restores the natural seasonal variability of water level fluctuations.

c. Suspended Particulate/Turbidity Determinations. Large freshwater discharges to the Indian River Lagoon through the C-54 Canal may increase turbidity and alter salinity regimes resulting in adverse impacts to oyster beds, clam-flats, and sea grasses (Estevez and Marshall 1993). A primary environmental goal of the USJRBP has been to minimize these freshwater releases.

(1) Expected Changes in Suspended Particulates and Turbidity Levels in the Vicinity of the Disposal Site. **Non-Applicable, since dredging will not occur at the site. Any turbidity in neighboring water bodies seen caused by this work will be controlled through the use of turbidity curtains.**

(2) Effects on the Chemical and Physical Properties of the Water Column.

(a) Light Penetration. Will be affected if large freshwater discharges occur at the basin.

(b) Dissolved Oxygen. The impoundment areas of the St. Johns River Water Management District have generally had the poorest water quality in the upper basin, particularly, those receiving water from surrounding agricultural lands. The

(c) impoundments areas often have lower dissolved oxygen (D.O.) and higher phosphorus, nitrogen, total dissolved solids, and chloride readings, than the river system. The lower the D.O. is in the water, the more likely a fish kill will occur in the river system.

(c) Toxic Metals, Organics, and Pathogens. Phosphorus and nitrogen are control elements governing growth in the water column.

(d) Aesthetics. No specific information available.

(3) Effects on Biota.

(a) Primary Productivity and Photosynthesis. No effect.

(b) Suspension/Filter Feeders. No effect.

(c) Sight Feeders. No effect.

d. Contaminant Determinations. Within acceptable levels.

e. Aquatic Ecosystem and Organism Determinations. See page 25-26

(1) Effects on Plankton. No effect expected.

(2) Effects on Benthos. No effect expected.

(3) Effects on Nekton. More habitat will be created by inundation of the TFMCA.

(4) Effects on the Aquatic Food Web. The area flooding will create open water habitat, increasing the habitat for the fish population and the food web that supports it.

(5) Effects on Special Aquatic Sites.

(a) Hardground and Coral Reef Communities. Not applicable.

(b) Sanctuaries and Refuges. Not applicable.

(c) Wetlands. 7,800 acres of shallow marsh will become open water fresh water habitat.

(d) Mud Flats. No effect.

(e) Vegetated Shallows. No effect.

(f) Riffle and Pool Complexes. Not applicable.

(6) Endangered and Threatened Species. Flooding will reduce the value of the TFMCA (especially the eastern third) as potential habitat for the crested caracara and the eastern indigo snake. Suitable habitat for these species is found immediately west in the SJMCA, and those specimens present are expected to relocate without impact. Optimal habitat conditions will be created for the wood stork in the same area, and potential forage habitat for the bald eagle will increase.

(7) Other Wildlife. Water fowl and wading birds will benefit from habitat creation.



(8) Actions to Minimize Impacts. None. Adverse impacts are not expected.

f. Proposed Disposal Site Determinations. **Non-Applicable since excavate will be used on site for levee construction.**

(1) Mixing Zone Determination. Not applicable.

(2) Determination of Compliance with Applicable Water Quality Standards. The U.S. Army Corps of Engineers has determined that this activity will comply with all applicable Florida Water Quality Standards.

(3) Potential Effects on Human Use Characteristics.

(a) Municipal and Private Water Supplies. Will enhance Biological treatment of runoff water entering the SJMCA and ultimately the Florida aquifer.

(b) Recreational and Commercial Fisheries. No commercial fisheries in the area.

(c) Water Related Recreation. Will create habitat for sports fishery species.

(d) Aesthetics. No adverse effect.

(e) Parks, National and Historic Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves. Not applicable.

g. Determination of Cumulative Effects on the Aquatic Ecosystem. Creation of open water aquatic ecosystem.

h. Determination of Secondary Effects on the Aquatic Ecosystem. None.

III. Findings of Compliance or Non-compliance with the Restrictions on Discharge.

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

b. No practicable alternative exists which meets the study objectives that does not involve discharge of fill into waters of the United States.

**c. After consideration of disposal site dilution and dispersion, the discharge of fill materials will not cause or contribute to, violations of any applicable State water quality standards for Class III waters. The discharge operation will not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.**

d. The work will not jeopardize the continued existence of any species listed as threatened or 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.

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

f. On the basis of the guidelines, the proposed disposal site for the discharge of dredged material is specified as complying with the requirements of these guidelines.