# FINAL DRAFT

# WATER QUALITY IMPROVEMENT STRATEGIES FOR THE EVERGLADES

# PRELIMINARY ALTERNATIVE COMBINATIONS FOR THE ESP BASINS

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**SOUTH FLORIDA WATER MANAGEMENT DISTRICT**
**West Palm Beach, Florida**

**Please contact Damon Meiers (dmeiers@sfwmd.gov) with comments or questions**

# WATER QUALITY IMPROVEMENT STRATEGIES FOR THE EVERGLADES PRELIMINARY ALTERNATIVE COMBINATIONS FOR THE ESP BASINS

## EXECUTIVE SUMMARY

Florida's 1994 Everglades Forever Act (Act) establishes both interim and long-term water quality goals to achieve restoration and protection of the Everglades Protection Area (EPA). The South Florida Water Management District (District), in partnership with other agencies and private landowners, is aggressively and successfully achieving these interim milestones. Basin-specific feasibility studies will evaluate alternative combinations of private works and public works to achieve compliance with the long-term water quality standards for the Everglades Protection Area. This document briefly describes the preliminary set of alternatives to be evaluated for the six Everglades Stormwater Program (ESP) basins. The six ESP basins include: Wellington/ACME Improvement District, North Springs Improvement District, North New River Canal, C-11 West, Feeder Canal, and L-28. A schematic of the ESP basins is presented in Figure 1.

**STAKEHOLDERS WILL BE INVOLVED THROUGHOUT THE DEVELOPMENT AND EVALUATION OF ALTERNATIVES.** Basin-specific characteristics will help shape the final alternatives. In order to reduce the number of different alternatives evaluated, a concerted effort will be made with the stakeholders of each basin to identify the most viable of the alternatives prior to conducting the evaluation of alternatives. Stakeholder input will be garnered through interactive development of the basin alternatives and updates during the evaluation process. Meetings with stakeholders have been conducted in each basin. Additional meetings will be scheduled as the study proceeds. In addition, all draft documents will be available for public review and comment on the District's website,

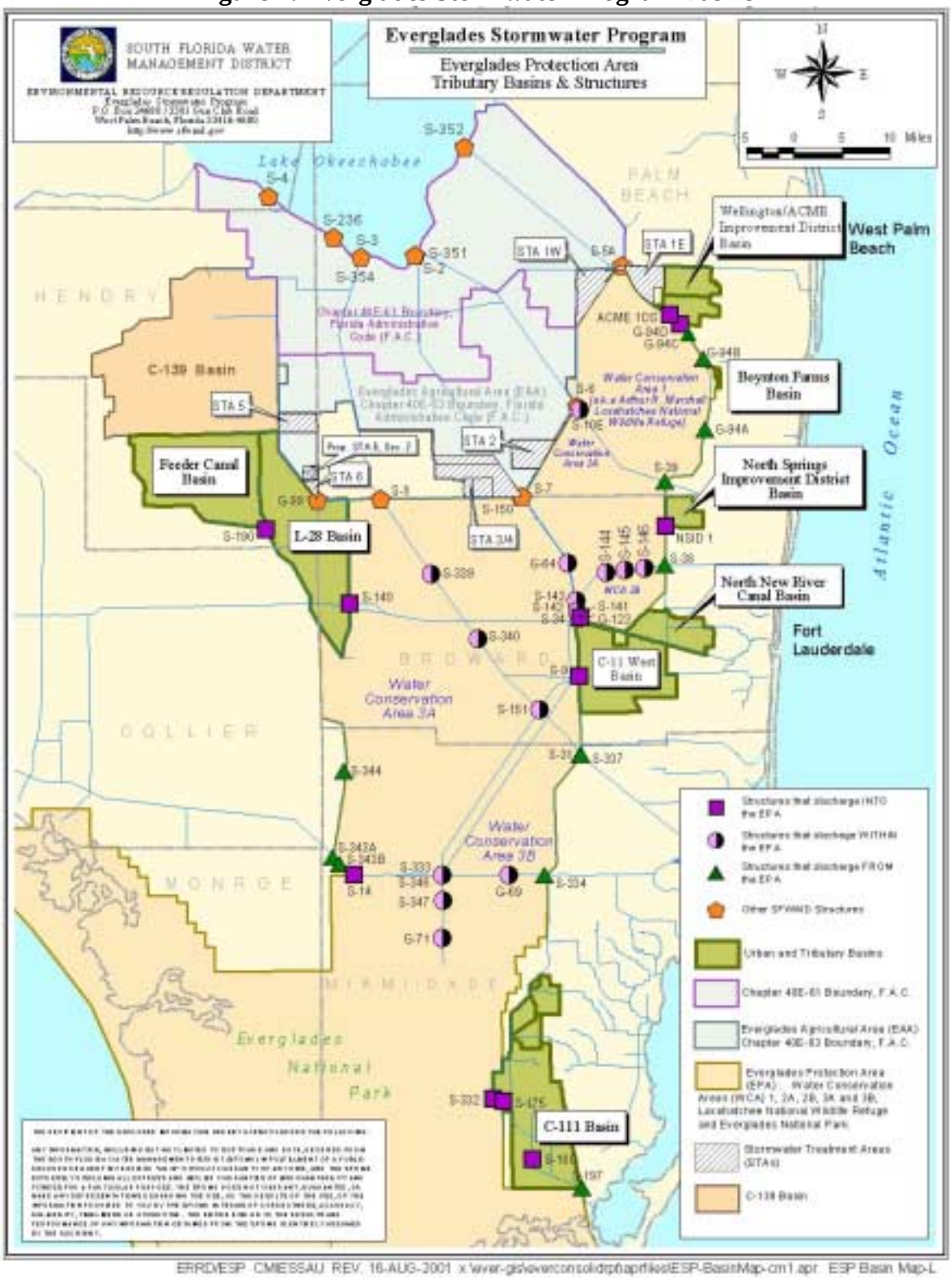
http://www.sfwmd.gov/org/erd/bsfboard/bsfsboard.htm

### Key Variables for Defining Alternatives

The following key variables were used in defining basin-specific alternatives for the ESP basins:

1. Operational changes, including diversion of flows
2. Basin-scale treatment, including biological and chemical treatment
3. Integration with CERP projects (see Table 1)

**Figure 1: Everglades Stormwater Program Basins**



GENERAL COMMENTS ON THE PRELIMINARY ALTERNATIVES

1. **Period of comparison.** To ensure valid comparisons among the alternatives for a specific basin, flows and phosphorus loads for each alternative will be estimated for a common period, from 12/31/2006 until 12/31/2056. This allows each alternative to consider the period prior to implementation of the relevant CERP project and the period after implementation of the relevant CERP project.

2. **Influence of source controls.** For the evaluation of alternatives, a sensitivity analysis will be performed to reflect varying degrees of phosphorus reduction due to source controls. It is anticipated that this sensitivity analysis will include reductions in phosphorus loads up to 25%, compared to the Baseline data set. The influence of these reductions on the outflow phosphorus concentrations of the alternative will be calculated and summarized. It will be assumed that there will be no change in the Baseline flows associated with source controls. The evaluation of alternatives will not include any cost estimates for source controls.

3. **Planning level phosphorus discharge target.** It has been suggested by external reviewers that the evaluation methodology include an additional planning level target for the basin discharge concentration other than 10 ppb, perhaps 20 ppb, to ensure that decision-makers realize that it may not be feasible to achieve 10 ppb. We feel that the formulation of the alternatives will yield a range of discharge concentrations, and all of them will be based on realistic, achievable performance (within the calibrated range of the DMSTA model), based on the best professional judgement of the staff and consultants involved. Hence, there is no need to have an additional target.

4. **Costs.** The evaluation will consider only incremental costs, i.e., in addition to costs already encumbered or budgeted to be spent, associated with specific alternatives. The evaluation will not include CERP project costs or source control costs, as they should be the same among the alternatives for a specific basin.

5. **Influence of CERP Projects.** To estimate the influence of CERP projects on the Baseline flows an updated "Alt D13R" SFWMM simulation will be conducted.

6. **Phosphorus model.** The Dynamic Model for Stormwater Treatment Areas (DMSTA) will be used to estimate the phosphorus load reduction of alternatives with STAs and/or storage reservoirs. DMSTA can also be used to route flows through flow equalization basins and other components associated with chemical treatment facilities.

7. **Baseline Data Set.** The Baseline data set developed in a previous phase of the basin feasibility studies will serve as the basis for comparison of alternatives. For a complete description of the Baseline data set and the methodology used to develop the Baseline data set, refer to *Baseline Data for the Basin-Specific Feasibility Studies to achieve the long-term Water Quality Goals for the Everglades*, May 2001.

## PRELIMINARY ALTERNATIVES FOR THE ESP BASINS

Preliminary combinations of operational changes, source control, basin-scale treatment and CERP projects for the ESP basins are presented below. Of the eight basins within the ESP, six are being evaluated in this study. The remaining two ESP basins (C-111 and Boynton Farms Basins) will be addressed through other District and Federal programs. Major components of the alternatives, along with probable influences on the flow volume and water quality of the discharges to the EPA are briefly described.

For each basin analyzed below, several of the options presented uses a December 31, 2006 completion date. That date was selected to be consistent with Florida's Everglades Forever Act, which established timelines for water quality improvement, culminating with this 2006 deadline for achieving water quality standards in all parts of the Everglades. However, due to technological, financial, and time limitations, complying with that deadline will be extremely difficult for many of the basins draining into the Everglades if variances or moderating provisions are unavailable. That is why other options in this document use completion dates later than 2006. Usually, these options integrate water quality improvement strategies with Comprehensive Everglades Restoration Plan (CERP) projects that are already scheduled for implementation in that basin. Selecting one of these options, however, could have significant legal consequences. At a minimum, state and federal regulatory agencies will need to agree that variances or moderating provisions are available. Legislative action may be needed to revise the Everglades Forever Act. And, in the worst case, parties to USA v. SFWMD Everglades litigation that spawned the Everglades restoration -- and its associated deadlines -- could potentially seek redress in the federal court system. Therefore, selection of water quality improvement strategies in the Everglades Stormwater Program basins will require careful consideration of these and other legal and regulatory issues.

For the evaluation of alternatives, a sensitivity analysis will be performed to reflect varying degrees of phosphorus reduction due to source controls. It is anticipated that this sensitivity analysis will include reductions in phosphorus loads up to 25%, compared to the Baseline data set. The influence of these reductions on the outflow phosphorus concentrations of the alternative will be calculated and summarized. It will be assumed that there will be no change in the Baseline flows associated with source controls.

## SUMMARY OF THE ESP BASIN ALTERNATIVES

**Table 1. Preliminary Alternative Combinations**

| Basin | Alt. | Divert | Source Control | Basin-scale Treatment: Biological | Basin-scale Treatment: Chemical | CERP Project & Date |
|---|---|---|---|---|---|---|
| North Springs Improvement District | 1 | | ✔ | | ✔ | ✔Hillsboro Impoundment (2007) |
| | 2 | ✔ | ✔ | | | |
| | 3 | | ✔ | | | ✔Hillsboro Impoundment (2007) |
| North New River Canal | 1 | | ✔ | | ✔ | ✔WCA-2 and WCA-3 Diversion (2018) |
| | 2 | ✔ | ✔ | | | ✔WCA-2 and WCA-3 Diversion (2018) |
| | 3 | | ✔ | | | ✔WCA-2 and WCA-3 Diversion (2018) |
| C-11 West | 1 | | ✔ | | ✔ | ✔ C-11 West Impoundment & Diversion Canal (2006) |
| | 2 | | ✔ | ✔ | | ✔ C-11 West Impoundment & Diversion Canal (2006) |
| | 3 | | ✔ | | | ✔ C-11 West Impoundment & Diversion Canal (2006) |
| Feeder Canal (not yet available) | 1 | | | | | ✔Miccosukee & Seminole STA (2016) |
| | 2 | | | | | |
| | 3 | | | | | |

| Basin | Alt. | Divert | Source Control | Basin-scale Treatment: Biological | Basin-scale Treatment: Chemical | CERP Project & Date |
|---|---|---|---|---|---|---|
| L-28 (not yet available) | 1 | | | | | ✔Miccosukee & Seminole STA (2016) |
| | 2 | | | | | |
| | 3 | | | | | |
| Wellington/ ACME Basin B (not yet available) | 1 | | | | | ✔ ACME Basin B OPE (2006) |
| | 2 | | | | | |
| | 3 | | | | | |