Appendix 5B-4: Implementation of the Long-Term Plan for Achieving Water Quality Goals in the Everglades Protection Area

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In accordance with the Everglades Forever Act [EFA; Section 373.4592(13), Florida Statutes (F.S.)], this appendix provides an annual update for Water Year 2013 (WY2013) (May 1, 2012–April 30, 2013) on the implementation of the Long-Term Plan for Achieving Water Quality Goals in the Everglades Protection Area (Long-Term Plan) and subsequent amendments. Achieving Everglades water quality standards by implementing the Long-Term Plan is one of the strategic priorities of the South Florida Water Management District (SFWMD or District) and is required by state and federal law. Additional supporting information on the Long-Term Plan and associated reporting is available in the 2005–2012 South Florida Environmental Reports (SFERs) – Volume I, Chapter 8, and 2013 SFER – Volume I, Chapter 5, and on the District's website at www.sfwmd.gov/sta.

BACKGROUND

In 1994, the Florida legislature enacted the EFA, requiring the District to submit the plan for achieving compliance with the total phosphorus (TP) criterion and other state water quality standards in the Everglades Protection Area (EPA)—including estimated costs, funding mechanisms and implementation schedules associated with the plan—to the Florida Department of Environmental Protection (FDEP) by December 31, 2003. Subsequently, the plan was developed and, in the amendments of 2003, the Florida legislature incorporated the plan by reference into the EFA. The plan is known as the Everglades Protection Area Tributary Basins Long-Term Plan for Achieving Water Quality Goals (Long-Term Plan; Burns & McDonnell, 2003). The 2003 Long-Term Plan consisted of various structural and operational enhancements as well as a science-based Stormwater Treatment Area (STA) optimization and research program.

In accordance with the amended EFA, to improve the performance of the initial phase of the Long-Term Plan STAs and incrementally optimize measures for further TP reductions, a science-based and adaptive implementation approach was used to develop nine revisions to the initial Long-Term Plan between 2004 and 2007. These revisions were vetted with stakeholders and approved by the FDEP (see 2005–2009 SFERs – Volume I, Chapter 8). Since that time, there have been no further requests for revision to the Long-Term Plan as of this reporting period. To date, through plan implementation the District has expanded the original Everglades STAs by an additional 17,000 acres, resulting in a total STA area including infrastructure components of roughly 68,000 acres, with approximately 57,000 acres of effective treatment area (STA-1 East, STA-1 West, STA-2, STA-3/4, and STA-5/6; see Figure 5B-1 of this volume) south of Lake Okeechobee. The key STA expansions and enhancements described in the 2003 Long-Term Plan have been completed and significant stormwater quality improvements have been realized.

However, the STA expansions and Long-Term Plan enhancements have not consistently achieved the 10 micrograms per liter (µg/L) TP criterion.

As of April 30, 2013, the Everglades Agricultural Area Best Management Practices (BMPs) and the Everglades Construction Project (ECP) STAs collectively have removed more than 4,267 metric tons (mt)[1] of TP that otherwise would have entered the EPA. Of this total, the STAs account for approximately 1,727 mt of TP since 2004 and the BMPs are associated with removing approximately 2,540mt. As described in Chapter 3A of this volume, the effectiveness of the BMP and STA TP removal efforts is demonstrated by decreased TP loading to the Water Conservation Areas (WCAs) in recent periods compared to the baseline period, despite increased flows to the EPA.

The District, FDEP, and U.S. Environmental Protection Agency (USEPA) engaged in technical discussions and, in June 2012, reached consensus on new strategies for further improving Everglades water quality. Under the Restoration Strategies Program, these strategies are intended to expand water quality improvement projects to achieve an ultra-low TP water quality standard established for the EPA (www.sfwmd.gov/restorationstrategies). Subsequently, the District and FDEP entered into two Consent Orders along with associated National Pollutant Discharge Elimination System (NPDES) and EFA Watershed Permits in August and September, 2012, respectively. The Consent Orders and permits are consistent with agreement on a consensus plan to achieve a Water Quality Based Effluent Limit (WQBEL) for discharges to the EPA (SFWMD, 2012a). The 12-year plan, which includes building additional features and STA expansions, is described in the Restoration Strategies Regional Water Quality Plan (SFWMD, 2012b). These features will provide enhanced treatment in the STAs. In addition to creating more than 6,500 acres of new treatment area and 116,000 acre-feet of additional water storage, sub-regional source controls will be implemented, and the Science Plan for the Everglades STAs (SFWMD, 2013; www.sfwmd.gov/rs_scienceplan) will focus research on further improving treatment area performance. The Restoration Strategies project features and their design and construction status are described in Chapter 5A, and further details on the Science Plan are presented in Chapter 5C of this volume.

In 2013, the Florida legislature modified the EFA and redefined the Long-Term Plan to also include the Restoration Strategies Regional Water Quality Plan, as defined in Section 373.4592(13), F.S. Pursuant to the new legislation, reporting of the annual update on the implementation of the Long-Term Plan is provided in this appendix for the WY2013 reporting period. The status of the WQBEL implementation, previously covered in the 2013 SFER – Volume I, Chapter 5, is now addressed in Chapters 5A, 5B, and 5C of this volume. The status of the projects and associated activities outlined in the initial phase of the Long-Term Plan, and the newly added projects associated with Restoration Strategies, is presented in the following section.

[1] The inception-to-date numbers for the Everglades STAs include start-up flows and loads.

STATUS OF LONG-TERM PLAN PROJECTS AND ACTIVITIES

The initial phase of the Long-Term Plan included 48 individual projects and processes, each having a schedule, scope, and cost estimate. With the addition of Restoration Strategies to the Long-Term Plan, 10 additional projects are now included in the Long-Term Plan, as presented in **Table 1**. The Long-Term Plan overlaps with other Everglades restoration efforts; therefore, some updates for Long-Term Plan projects and processes appear in other chapters of this volume (see **Table 1**). The Long-Term Plan projects that address the non-Everglades Construction Project (non-ECP) basins and source controls are discussed in Chapter 4, and the Long-Term Plan projects relating to the ECP STAs are discussed in Chapter 5B of this volume. Detailed data summaries and findings related to the individual performance of the BMPs and STAs are also covered in these two chapters, respectively. The list of the ECP and non-ECP basins addressed in the Long-Term Plan is summarized in **Table 2** and their respective locations are shown in **Figure 1**. Financial reporting related to the implementation of the Long-Term Plan is summarized in Appendix 1-5 of this volume.

Table 1. Summary of projects and cross-referenced chapters in the Long-Term Plan for Achieving Water Quality Goals in the Everglades Protection Area (Long-Term Plan).

Project Description	Chapter References in the 2014 SFER – Volume I
ECP Projects	
STA-1E Enhancements	Project complete
STA-1W Enhancements	Project complete
STA-2 Enhancements	Project complete
STA-3/4 Enhancements	Project complete
STA-5 Enhancements	Project complete
STA-6 Enhancements	Project complete
ECP Operation and Maintenance - STAs and non-STAs	5B (Each STA section)
ECP Compliance Monitoring	5B (Each STA section)
ECP Operations Monitoring	5B (Project-level activities section)
STA Site Management	5B (Project-level activities section)
Acme Basin B	Project complete
Compartment B STA including STA-2, Cell 4	Project complete
Compartment C STA including STA-5 Flow-way 3 and STA-6, Section 2	Project complete
EAA Conveyance and Regional Treatment Project (ECART)	Future reports
Restoration Strategies Projects	
A-1 Flow Equalization Basin	5A
L-8 Flow Equalization Basin	5A
L-8 Divide Structure	5A
S-5AS Divide Structure	5A

Project Description	Chapter References in the 2014 SFER – Volume I
STA-1W Expansion #1	5A
S-375 Structure Expansion	5A
C-139 Flow Equalization Basin	5A
STA-5/6 Earthwork	5A
G-341 Related Improvements	5A
Non-ECP Basin Projects	
North Springs Improvement District Basin Source Controls	4
North New River Canal Basin Source Controls	4
C-11 West Basin Source Controls	4
Feeder Canal Basin Source Controls	4
Process Development and Engineering	
Basin Source Controls	
EAA Basins - Source Controls	4
C-139 Basin - Source Controls	4
Enhanced Control and Monitoring	
Acquisition of Survey Data	Project complete
Additional Flow and Water Quality Monitoring Stations	Project complete
Review and Correction of Flow Measurement Anomalies	5B (Project-level activities section)
Analysis and Interpretation	5B (Project-level activities section)
Update and Maintenance of Hydraulic Models	Activity complete
Improved Analytical and Forecasting Tools	
Continued Development and Refinement of DMSTA	Ongoing refinement (future reports)
Water Quality Impacts of Reservoirs	Project complete
Periphyton-based STA (PSTA) Investigations	Project completed by USACE
PSTA Implementation Project in STA-3/4	5B (Project activities section)
Optimizing SAV Performance	
Operational Strategy	Project complete
Vegetation Maintenance	Project complete
Hydrologic and Hydraulic Assessment	Future reports
Internal Measurements	Future reports
Comparative Analysis	Future reports

Project Description	Chapter References in the 2014 SFER – Volume I
Additional Structural and Operational Measures	
Evaluation of Full-Scale STA Enhancements	Project complete
Improved Reliability of Inflow Forecasts	
Update Baseline Datasets	Ongoing
Basins With Limited Current Data	Complete
Influence of CERP Projects on Inflow Volumes and Loads	Complete
Lake Okeechobee Long-Term Trends	Ongoing
Determine Water Quality Relationships in the EPA	Complete
ACCELERATE RECOVERY OF IMPACTED AREAS	
Recovery Model Development and Calibration	6 (2007 SFER – Volume I) and future reports
Downstream Influence of Adding Clean Water to Previously Impacted Areas	Future reports
Options for Accelerating Recovery	Future Reports
Alternatives Analysis and Plan Formulation	Future reports
Hydropattern Restoration	Future reports
Implement Steps for Recovery in Impacted Areas	Future reports
ADAPTIVE IMPLEMENTATION	Ongoing activity
PROGRAM MANAGEMENT	Ongoing activity

CERP – Comprehensive Everglades Restoration Plan
DMSTA – Dynamic Model for Stormwater Treatment Areas
EAA – Everglades Agricultural Area
ECP – Everglades Construction Project
EPA – Everglades Protection Area
PSTA – Periphyton-Based Stormwater Treatment Area
STA – Stormwater Treatment Area

Table 2. EPA tributary basins included in the Long-Term Plan.

Basin	Canal	Stormwater Treatment Areas	Receiving Water Conservation Areas
S-5A (EAA)	West Palm Beach Canal	STA-1W, STA-1E, STA-2	WCA-1
S-6 (EAA)	Hillsboro Canal	STA-2	WCA-2A
S-7 (EAA)	North New River Canal (NNRC)	STA-3/4	WCA-2A
S-8 (EAA)	Miami Canal	STA-3/4, STA-5/6	WCA-3A
C-51 West	C-51 West	STA-1E, STA-1W	WCA-1
C-139 (including Annex)	L-3 Canal	STA-5, STA-5/6	WCA-3A
ACME Basin B	West Palm Beach Canal	STA-1E	WCA-1
North Springs Improvement District	N/A	N/A	WCA-2A
NNRC (G-123)	NNRC	N/A	WCA-3A
C-11 West	C-11 West	N/A	WCA-3A
Feeder Canal	L-28 Interceptor Canal	N/A	WCA-3A
L-28	L-28	N/A	WCA-3A

EAA – Everglades Agricultural Area
N/A – Not Applicable
NNRC – North New River Canal
WCA – Water Conservation Area

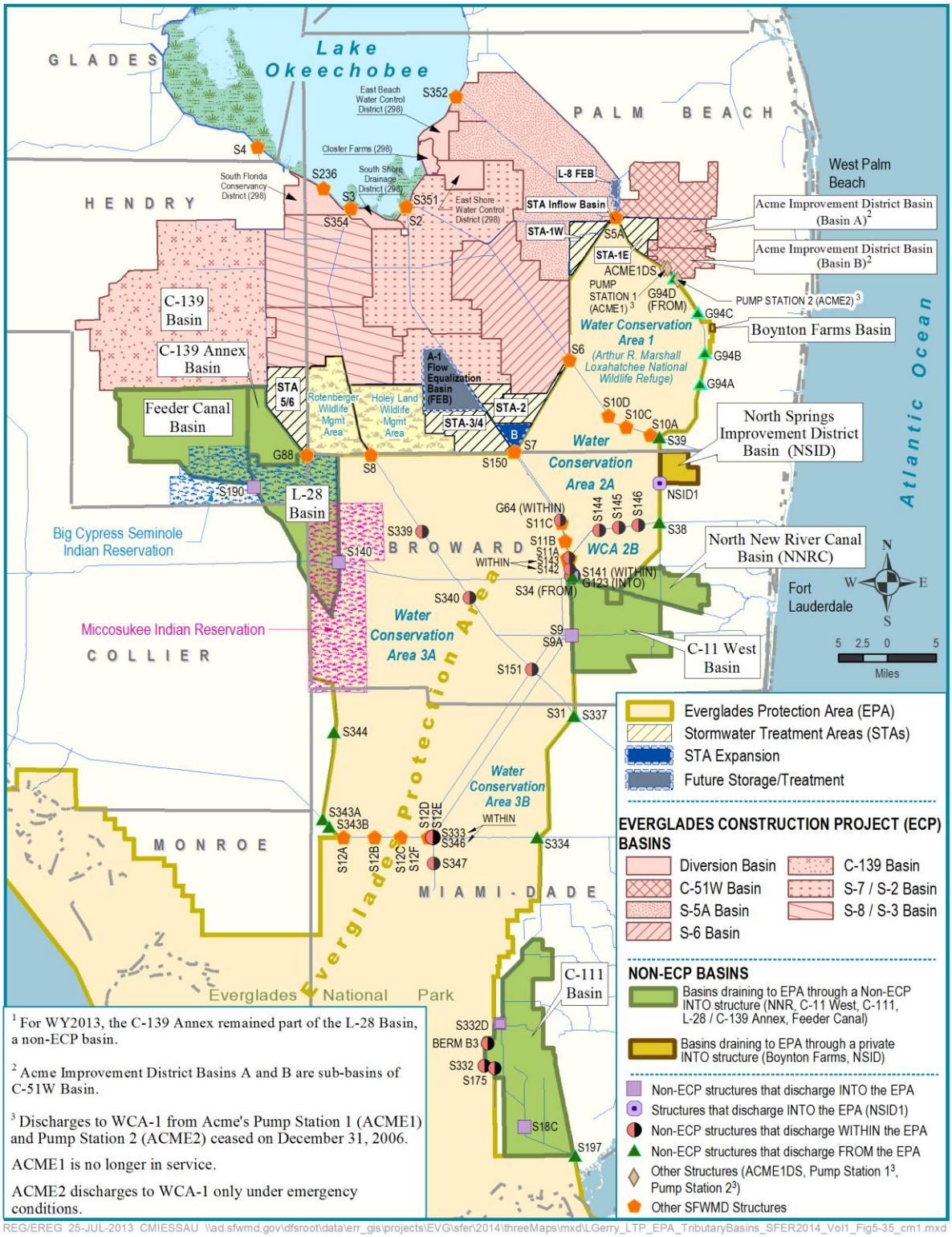

Figure 1. Overview of the Everglades Protection Area and tributary basins.

LITERATURE CITED

Burns and McDonnell. 2003. Everglades Protection Area Tributary Basins Long-Term Plan for Achieving Water Quality Goals. October 2003. Report prepared for the South Florida Water Management District, West Palm Beach, FL.

SFWMD. 2012a. Technical Support Document for Derivation of the Water Quality Based Effluent Limit for Total Phosphorus in Discharges from Everglades Stormwater Treatment Areas to the Everglades Protection Area. South Florida Water Management District, West Palm Beach, FL. June 27, 2012.

SFWMD. 2012b. Restoration Strategies Regional Water Quality Plan. South Florida Water Management District, West Palm Beach, FL. April 27, 2012.

SFWMD. 2013. Restoration Strategies Regional Water Quality Plan: Science Plan for the Everglades Stormwater Treatment Areas. South Florida Water Management District, West Palm Beach, FL. June 2013.