



Rule Development Workshop

Everglades Regulatory Program

Chapter 40E-63, Florida Administrative

Code

Everglades Agricultural Area

August 29, 2017

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Bureau of Everglades Technical Support

Logistics Checklist

- Roll call
- Phone and WebEx participants: Mute phones and computer
- Avoid putting the meeting “on-hold”
- In person: Conference room microphones in the ceiling



Background

- The Everglades Forever Act mandates implementation of Chapter 40E-63, Florida Administrative Code (FAC)
- Part I, the Everglades Agricultural Area (EAA) Regulatory Program, adopts **methods** to determine compliance with a total phosphorus (TP) load reduction requirement
- Changes in the methods require rule amendment
- Authorized by Governing Board in July 2017



Compliance Determination Methods

Requirement: Reduce TP loads in EAA runoff by 25%

Current Water Year ¹

TP Load in Runoff



Compared with



**Base Period
(WY 1980 – 1988)**

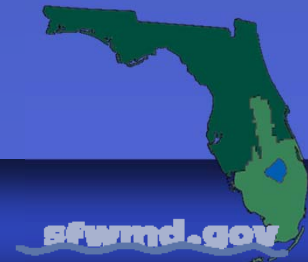
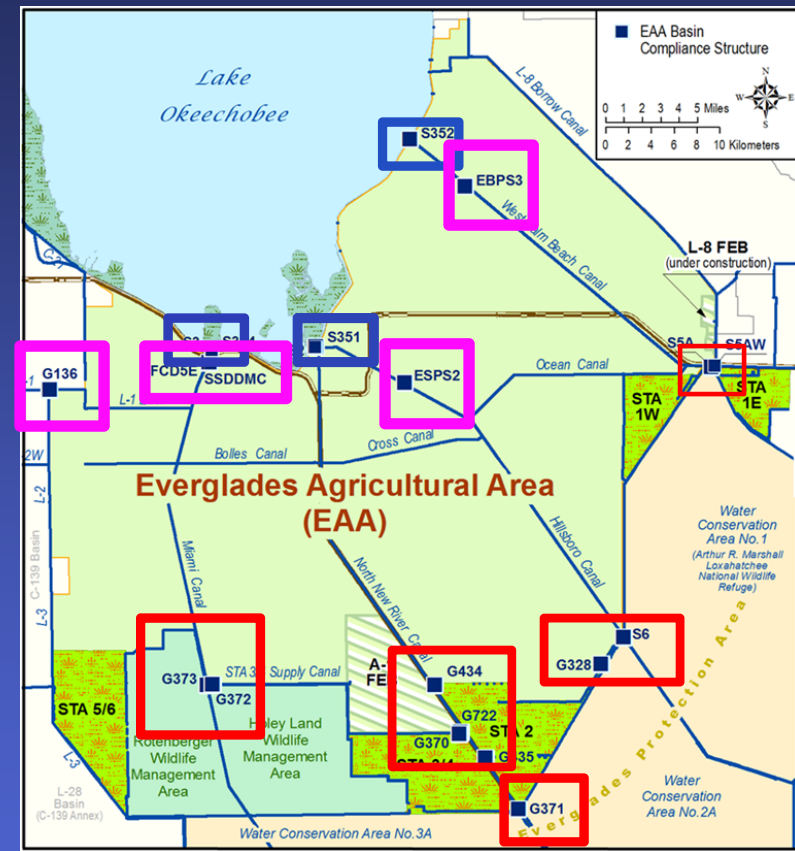
Pre-BMPs TP Load in Runoff

¹Water Year (WY) is the period from May 1 of one year to April 30 of the following year.



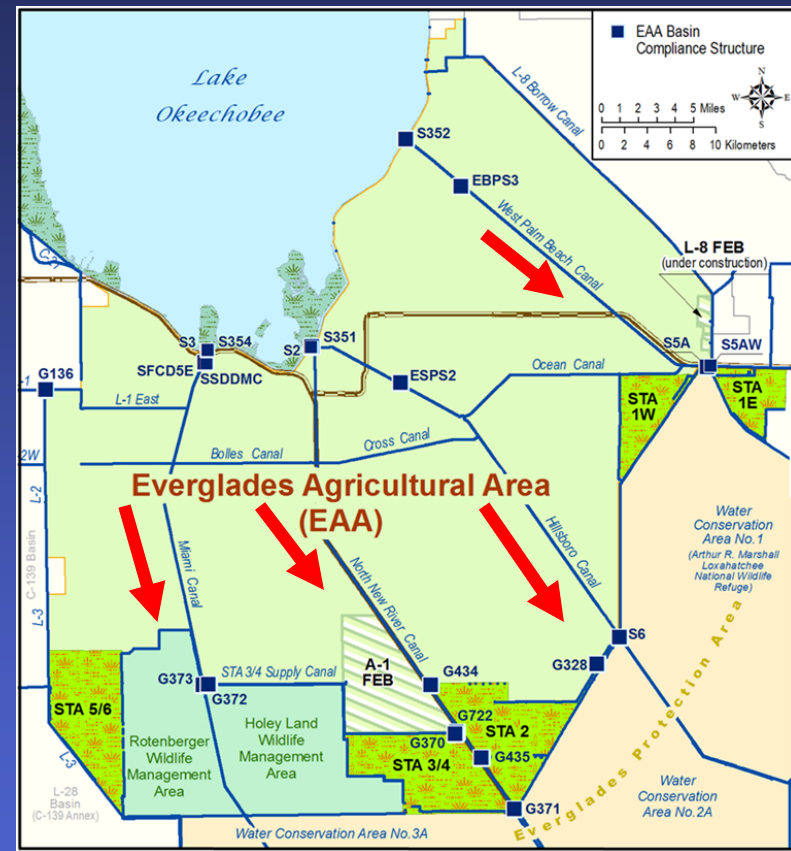
Methods: Water Quality Monitoring

- **Establish boundary structures where TP concentration and flow are measured**
- **These structures define the acreage contributing to EAA runoff**
 - **Everglades Construction Project (ECP)**
 - **Lake Okeechobee**
 - **New inflows**



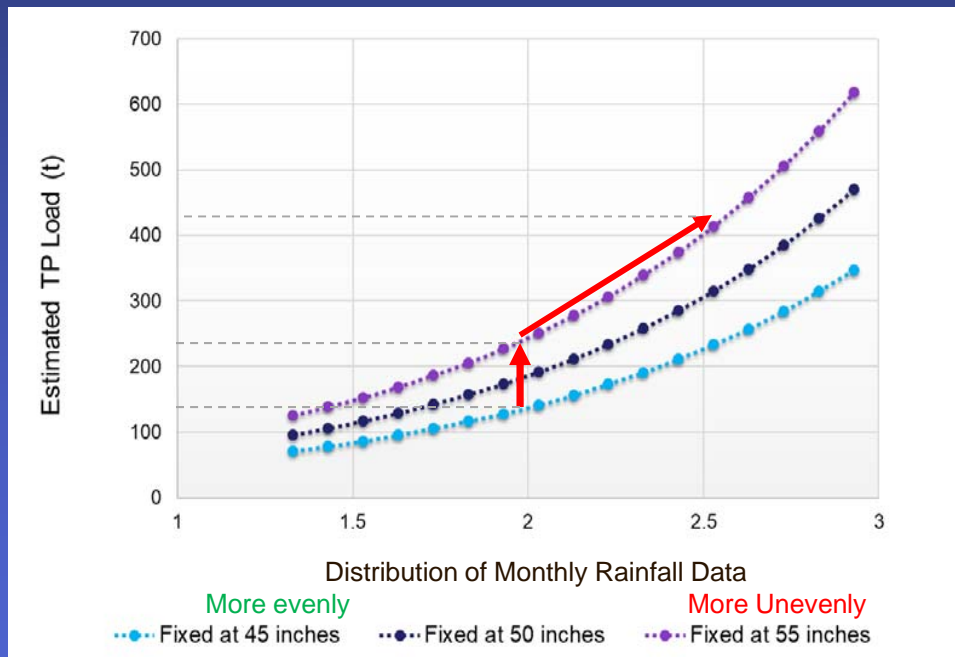
Methods: Measured TP Load

- Calculate **WY TP Load** in EAA runoff:
 - Includes Lake Okeechobee discharges
 - Deducts new sources and “pass-through” flows



Methods: Base Period TP Load

- Adjust for rainfall intensity and distribution
- Deduct acreage no longer contributing to runoff



Base Period = 523,721 acres



WY17 = 446,730 acres

15% reduction in EAA acreage
contributing to runoff

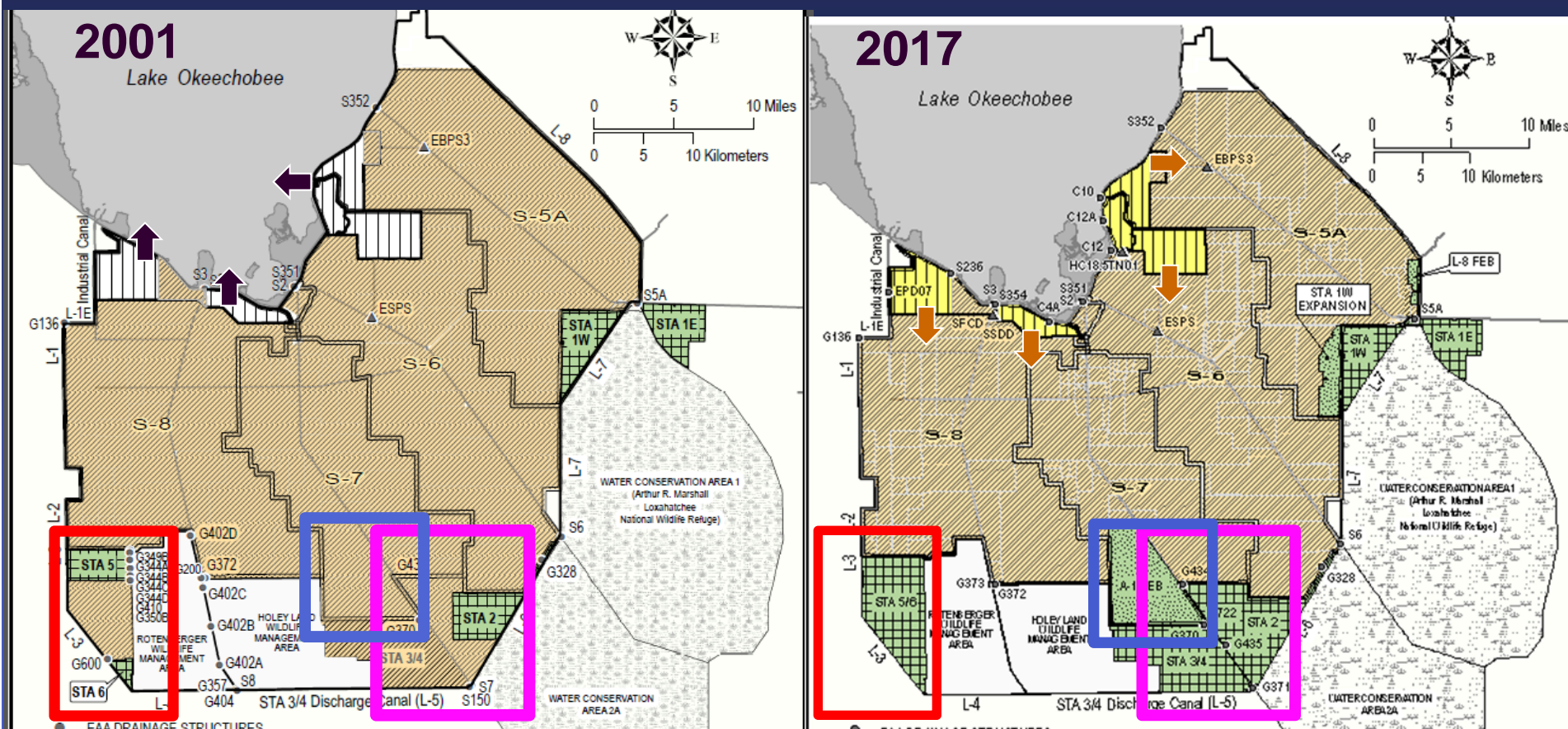


Why are the Amendments Needed?

- The methods in Chapter 40E-63, FAC, Part I were last amended in 2001
- Various projects completed as part of the Everglades Construction Project, Long-term Plan and Restoration Strategies
 - New boundary structures and methods have become effective
 - New EAA basin inflows (Lake Okeechobee diversion basins)



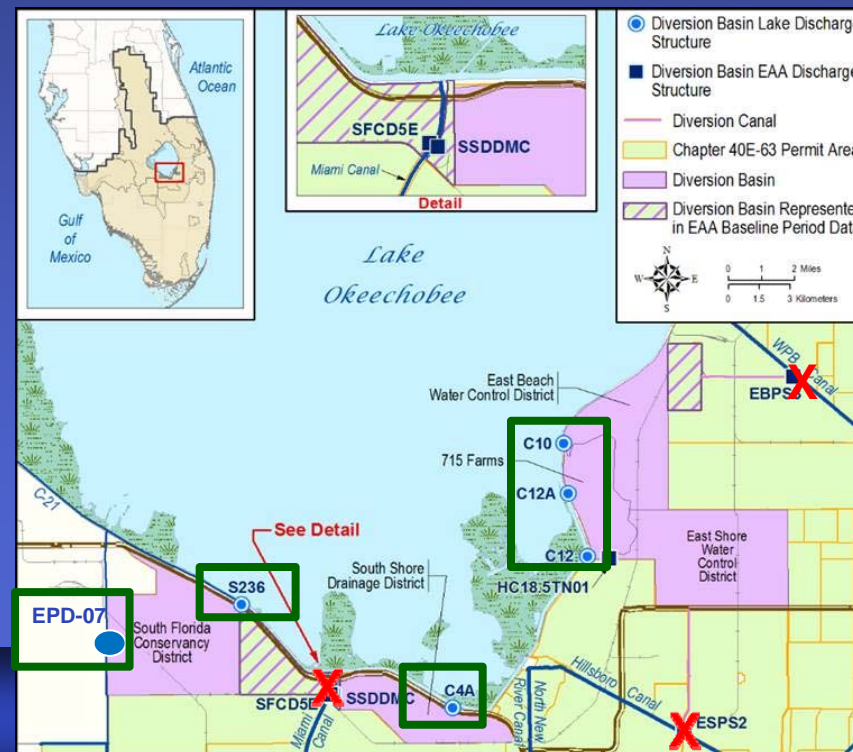
What are these Projects?



- Stormwater Treatment Areas (STA) 5/6, 3/4 and 2
- A-1 Flow Equalization Basin
- Diversion of flows from water control districts and Closter Farms away from Lake Okeechobee and into the EAA

Projects: Diversion Basins

- Did not discharge to the EAA during the Base Period
- Estimated Base Period TP Load: Adjust up, proportional to the increase in acreage (6%)
- Calculated TP Load in EAA Runoff:
 - Structures into the EAA => internal structures
 - Structures to Lake Okeechobee => EAA boundary structures



Amended Rules

- **40E-63.091 Publications Incorporated by Reference**
 - Appendix A1 – Regulated portion of the EAA
 - Appendices A3, A3.1, A3.2 – EAA basinwide compliance
 - Appendix A4 – EAA farm scale compliance
- **40E-63.104 EAA Basin Boundaries**
- **40E-63.106 Works of the District within the Everglades**



40E-63.104

EAA Basin Boundaries

40E-63.104 EAA Basin Boundaries.

(1) The Everglades Protection Area is generally described as: Water Conservation Areas 1, 2A, 2B, 3A and 3B, the Arthur R. Marshall Loxahatchee National Wildlife Refuge, and the Everglades National Park. It is depicted on maps and legally described in “Appendix A1,” which is incorporated by reference in Rule 40E-63.091, F.A.C. of Chapter 40E-63, F.A.C., which is published by reference and incorporated into this chapter.

(2) The EAA is generally described as:

(a) the area including, but not limited to, the drainage basins of S-2, S-3, S-5A, S-6, S-7, S-8 and S-150. The EAA is depicted on maps and legally described in “Appendix A1,” which is incorporated by reference in Rule 40E-63.091, F.A.C.; and of Chapter 40E-63, F.A.C.

(b) The Everglades Construction Project diversion basins, consisting of the areas within the boundaries of the South Florida Conservancy District, South Shore Drainage District, East Shore Water Control District, East Beach Water Control District, and Closter Farms (also known as 715 Farms or the lessee of agricultural lease number 3420). These basins previously released stormwater to Lake Okeechobee, but stormwater was redirected as new releases to Works of the District within the Everglades under Rule 40E-63.108, F.A.C., when the diversion projects were completed. The Everglades Construction Project Diversion Basins are depicted on maps and legally described in “Appendix A1,” which is incorporated by reference in Rule 40E-63.091, F.A.C.

(3) The areas described in subparagraphs (2) (a) and (b) are regulated under Part I of this Chapter and are included in calculating phosphorus load reductions as set forth in “Appendix A3” and “Appendix A4,” which are incorporated by reference in Rule 40E-63.091, F.A.C.

40E-63.106 Works of the District within the Everglades

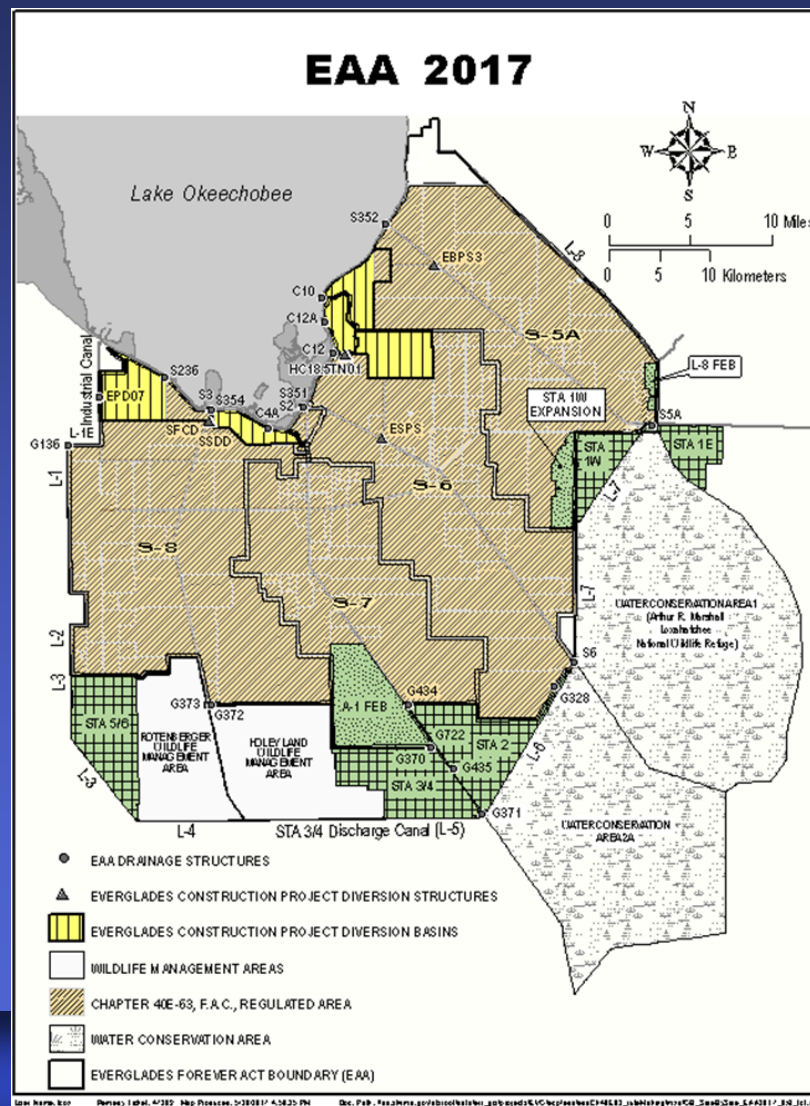
40E-63.106 Works of the District within the Everglades.

The following Works of The District within the Everglades Agricultural Area Basin include ~~are or have been used for calculating compliance with the phosphorus load reduction objectives of the Everglades program:~~ S-2, S-3, S-5A, S-6, S-7, S-8, S-150, G-88, G-136, G-200, G-344A, G-344B, G-344C, G-344D, G-349B, G-350B, G-357, G-404, G-410, G-402-A, G-402-B, G-402-C, G-402-D, G-605, G-606, Miami Canal, North New River Canal, Hillsboro Canal, C-51 (at both current and ultimate discharge locations into the Everglades Protection Area), and their open channel connections. The Works of the District and other structures which are or have been used for calculating compliance with the phosphorus load reduction objectives of the Everglades program are set forth in “Appendix A3,” which is incorporated by reference in Rule 40E-63.091, F.A.C.

Appendix A1

Regulated Portion of the EAA

- **EAA sub-basin boundary descriptions**
 - **Add Everglades Construction Project Diversion Basins**
- **Maps:**
 - **Figure 1: Everglades Restoration Area**
 - **Figure 2: EAA**



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EAA Basinwide Compliance

APPENDIX A3 EAA BASIN COMPLIANCE

INTRODUCTION

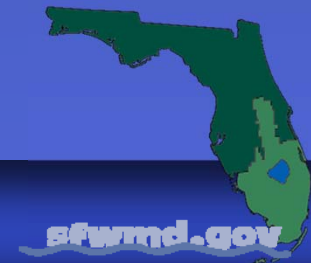
This Appendix sets forth the procedures the District ~~shall will~~ follow ~~in the future~~ to determine whether the entire EAA Basin has met the goal of reducing total phosphorus (TP) discharged by 25 percent, under any set of hydrologic conditions that could arise, after implementation installation of farm-level BMPs as described in Part I of Chapter 40E-63, F.A.C., The first determination was for the period, May 1, 1995 through April 30, 1996, and annually thereafter. The annual determination requires calculation of ~~future~~ TP load leaving the structures from the EAA (location shown in Figure A4 and listed in Table A1). The load calculation must will also include phosphorus carried into Lake Okeechobee through backpumping ~~when this occurs.~~ It ~~also requires the~~ and adjustment for pass-through flows released from Lake Okeechobee and other sources to Stormwater Treatment Areas, the Holey Land, Water Conservation Areas and the Lower East Coast.

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Rainfall

EAA rainfall is calculated from measurements at representative rainfall gauges. Rainfall gauges provide an estimate of rainfall at a “point” location. Since rainfall is expected to vary in intensity and duration over an area, rainfall data from representative gauges are area-weighted using the Thiessen Polygon Method. Nine rainfall gauges have historically been used to estimate EAA rainfall. Daily rainfall data for each rainfall gauge are stored in the DBHYDRO database. The rainfall gauge station names, DBHYDRO identifiers and area-weights corresponding to each rainfall gauge station are listed in Table A3. EAA rainfall for the May 1 through April 30 period is calculated as the area-weighted sum of the daily rainfall measurements at each rainfall gauge.

<u>Identifier¹</u>	<u>Station</u>	<u>Theissen Weight</u>
<u>15197</u>	<u>ALICO_R</u>	<u>0.0974</u>
<u>15198</u>	<u>MIAMI LO_R</u>	<u>0.1076</u>
<u>15199</u>	<u>SOUTH BA_R</u>	<u>0.0844</u>
<u>15200</u>	<u>BELLE GL_R</u>	<u>0.1617</u>
<u>15201</u>	<u>PAHOKEE1_R</u>	<u>0.1438</u>
<u>15202</u>	<u>S5A_R</u>	<u>0.0989</u>
<u>15203</u>	<u>S6_R</u>	<u>0.0763</u>
<u>15204</u>	<u>S7_R</u>	<u>0.0592</u>
<u>15205</u>	<u>S8_R</u>	<u>0.1743</u>



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Structures

TABLE A1
EAA BASIN DRAINAGE STRUCTURES
DATABASE KEYS TO FLOW DATA TIME SERIES

Structure	Preferred ¹	Effective Date ²	Inactive Date ³ (if applicable)
S-352 Complex	150 ⁶⁰	Base Period ²	
S-2 Complex	150		
S-3 Complex	150		
S-5A Complex	150		
S-6	150		
S-7	150		
S-150	150		
S-8	150		
G-88	151		
G-136	151		
G-200	157		
G-250	162		

Structure	Preferred ¹	Effective Date ²	Inactive Date ³ (if applicable)
<u>G-373</u>	<u>TS260</u>	<u>02/15/2006</u>	-
<u>G-373BC</u>	<u>TS262</u>	<u>06/01/2005</u>	<u>07/21/2005</u>
<u>G-434</u>	<u>90327</u>	<u>11/01/2012</u>	-
<u>G-435</u>	<u>90328</u>	<u>05/17/2013</u>	-
<u>G-722</u>	<u>AM015</u>	<u>08/28/2015</u>	
<u>C-10</u>	<u>15645</u>	<u>05/01/2018</u>	-
<u>C-12A</u>	<u>15647</u>	<u>05/01/2018</u>	-
<u>C-12</u>	<u>15646</u>	<u>05/01/2018</u>	-
<u>C-4A</u>	<u>15648</u>	<u>05/01/2018</u>	-
<u>S236</u>	<u>15644</u>	<u>05/01/2018</u>	-
<u>EPD07</u>	<u>AM706</u>	<u>05/01/2018</u>	-

n New, flow data time series for the Holey Land pump station begins on November 25, 1991

¹The reference numbers in the table are keys to the data sets, known as "dbkeys".

² The term "Base period" indicates that the structure was part of the EAA model boundary from October 1, 1978 through September 30, 1988. The format is Month – Day – Year.

³A date is indicated for those structures that are inactive as of the date of this amendment. The format is Month – Day – Year.

40E-63.091

Appendix A3.1

APPENDIX A3.1 FORTRAN PROGRAM FOR CALCULATING EAA BASIN FLOWS AND PHOSPHORUS LOADS

```
program eaatpld
c modified August, 2000 for various ECP elements
c modified may 1999 for STA-5 inflows from Miami Canal (G350B, G349B)
c modified october 1998 for STA-5 & STA-2
c modified march 1998 for STA-6
c utilizes all composite samples
c compute eaa tp load 10-96 - additional comments added 10-3-96
c usage:g
c      >eaatpld eaa.job
c eaa.job = input ascii file specifying case conditions
c subroutines in subr.for
c maximum dimensions
c number of days = 20000 12000 = 52_32 + years ~(1978-203010)
c number of grab samples = 4000 2000 per station
c number of composite samples = 4000 2000 per station

c array dimensions increased to handle maximum of 7040 terms
      integer*4 dgrab,dcomp,dlast,dk
      character*64 title
      character*32 ofile1,ofile2,ofi
      character*32 ofile5
      character*32 blank '/' '/'
      character*8 slab,dum8,slab,ul

      c modified March 2017 to include C10, C12, C12A, C4A, S236 and epd07
      c modified Feb 2016 for A-1 FEB outflow structure g722
      c modified Sept 2004 for STA3/4 inflows and outflows
      c modified June 2004 for addition of g507, g204-g206
      c modified August 2000 for various ECP elements
      c reads daily flows - modified for STA-6 march 1998
      c modified for STA-2 & STA-5 may 1999
      c missing values not allowed in flow file
```

40E-63.091 Appendix A3.2

APPENDIX A3.2 FLOW COMPUTATION METHODS USED TO CALCULATE EAA BASIN FLOWS

Table of Contents

The adjusted head H_{lo} is used to compute Q_{lo} .

$$Q_{lo} = C_0 + C_1 H_{lo} + C_2 H_{lo}^2 + C_3 H_{lo}^3$$

GATED SPILLWAYS

- Parameters
- Uncontrolled Free Flow
- Uncontrolled Submerged Flow
- Controlled Free Flow
- Controlled Submerged Flow
- Over-the-top Flow

PUMPS

- Parameters
- Pump Flow
 - Constant-speed Pump
 - Variable-speed Pump
 - Variable-speed Pump with Very Variable Head
- Siphon Flow

CULVERTS

- Parameters



Pump
S-5A
S-6
S-7
S-8
G-404
G-410
EBPS
ESPS
<u>G-507</u>
<u>G-370</u>
<u>G-372</u>
<u>SSDD</u>
<u>SFCD</u>
<u>G-434</u>
<u>G-435</u>
<u>C-10</u>
<u>C-12A</u>
<u>C-12</u>
<u>C-4A</u>
<u>S236</u>
<u>EPD07</u>

40E-63.091 Appendix 4

EAA Farm Scale Compliance

APPENDIX A4 EAA FARM SCALE ALLOCATION

This Appendix sets forth the procedure the District will follow in the future to regulate total phosphorus (TP) loads from individual farms when the EAA Basin has been determined to be “Not In Compliance” with the Target or Limit according to the procedures set forth in Appendix A3. Within the context of the methodology described, “farm” refers to a hydrologic drainage area described by the District in the permits as a basin ID.



Basin	X _m	C _m	S _m	R _{am}
EAA Total	3.866	0.7205	0.7339	47.73
S5A ¹	3.918	0.7636	0.9999	50.31
S6 ²	3.907	0.7302	0.7476	49.77
S7	3.835	0.7198	0.6112	46.27
S8 ³	3.822	0.8409	0.8409	45.68

¹Also to be used for East Beach Water Control District basin ID 50-033-02.

²Also to be used for Agricultural Lease 3420 basin ID 50-077-01, and East Shore Water Control District basin ID 50-080-01.

³Also to be used for South Shore Drainage District basin ID 50-081-02, and South Florida Conservancy District basin ID 50-010-06.

Conclusions

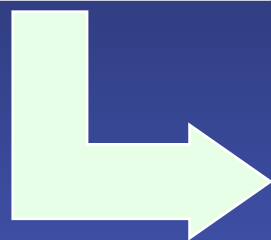
- Amendments incorporate changes in structures and methods
- Draft rule language, updates and responses will be available at:

<https://www.sfwmd.gov/doing-business-with-us/rules>

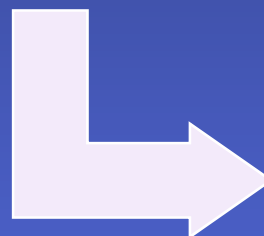


Tentative Schedule

Comments due
September 12, 2017



Governing Board
Rule Adoption
November 9, 2017



Rule Effective
January 2018

Comments or Questions ?

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