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
Division of Water Resources

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1.0 Introduction

This report documents the method used to derive the water quality based effluent limit (WQBEL) that will be applied to all permitted discharges from Everglades Stormwater Treatment Areas (STAs) to the Everglades Protection Area (EPA) to assure that such discharges do not cause or contribute to exceedances of the 10 parts per billion (ppb) total phosphorus (TP) criterion (expressed as a long-term geometric mean [LTGM]) established under 62-302.540, Florida Administrative Code (F.A.C.). The entire methodology to derive the WQBEL, as documented in this report, adheres to derivation guidelines specified and required by the Florida Department of Environmental Protection (FDEP). The FDEP derivation guidelines included methods and assumptions which FDEP adopted from the WQBEL Technical Support Document presented as "Attachment G – 2010 USEPA Amended Determination to Achieve Water Quality Standards in the Everglades". The WQBEL will be applied through a two-part test and the derivation presented herein is based on the following assumptions:

1. The use of a geometric mean (GM) to represent the annual outflow concentration from a STA, when testing compliance with the WQBEL, does not appropriately account for the month-to-month variability in outflow volume and concentration during the year. An annual flow-weighted mean (FWM) outflow concentration would be a more appropriate expression of STA performance for a WQBEL.

2. The WQBEL will be applied to the annual discharge from each STA individually. For a STA with one discharge location (e.g. STA-1E), the WQBEL will be applied to the single discharge location. In the case of multiple discharge locations (e.g. STA-1W) for a STA, the WQBEL will be applied to the annual FWM TP concentration calculated across all discharge locations. By deriving a WQBEL applicable to the discharge points, the complexities associated with monitoring compliance in the EPA are avoided and assurances are provided that the EPA is adequately protected to meet the spatially averaged LTGM. Application of the WQBEL proposed herein to the discharges from a STA will not alter the monitoring required by the TP criterion rule (62-302.540, F.A.C.) in any manner.

3. Since the WQBEL is applicable to the point(s) of discharge from a STA, changes in concentration between the STA discharge point(s) and the location where the discharge enters the EPA are ignored for the purpose of this derivation. In most cases, the discharge from a STA occurs through a canal for some distance before actually entering the EPA. While in the canal, the discharge may be mixed with other water and be subject to other biogeochemical processes, which may result in increases (e.g., sediment reflux) or decreases (e.g., assimilation or adsorption) in TP concentration in the water actually entering the EPA. The changes in TP concentrations resulting from these processes are likely highly site specific and would be difficult to evaluate.

4. The derivation of the WQBEL is independent of antecedent phosphorus conditions in the downstream marsh receiving waters of the EPA. That is, there is no distinction between discharges to previously impacted portions of the EPA and discharges to unimpacted portions of the EPA for the purposes of this derivation.

5. To provide assurance that STA discharges do not cause or contribute to exceedances of the 10 ppb TP criterion (expressed as a LTGM) for the EPA under the TP rule, the WQBEL derived herein is comprised of two parts, both of which must be met. The first part of the WQBEL is expressed as a long-term flow-weighted mean (LTFWM) TP concentration that is approximately equivalent to a LTGM concentration of 10 ppb, and the second part of the WQBEL is expressed as a maximum annual flow-weighted mean (AWFM) TP concentration.

2.0 Methodology – Derivation Based Upon STA Monitoring Data

The objective of the WQBEL is to establish an effluent limitation, as measured by an annual FMW TP concentration, for the discharge from a STA to ensure that the Everglades Protection Area criterion under the TP rule is not violated. The WQBEL was derived by using the methods specified by FDEP and described below to apply the 10 ppb LTGM TP criterion, translated into a FWM TP concentration, directly to the discharge for each STA. To accomplish this, two parts have been developed for the WQBEL to allow for expected year-to-year variability in the STA discharge TP concentration, as observed at the marsh reference sites used to develop the TP criterion, while attaining the long-term TP criterion. Therefore, if the discharges from each STA meet the WQBEL, phosphorus discharges into the Everglades Protection Area will not result in a criterion exceedance.

2.1 Basis for Expressing the WQBEL as a Flow-weighted Mean

The FWM is the most commonly used statistic to express the central tendency of concentrations in a flowing system. Unlike an arithmetic mean, which assigns equal weight to each observed concentration, the FWM weighs each observed concentration proportionally to the magnitude of the associated flow. Therefore, this statistic properly accounts for TP concentrations in discharges from a STA into the downstream receiving water. All of the phosphorus limits applied to STA discharges are expressed as FWM TP concentrations. For Everglades National Park, the TP rule specifies that achievement of the criterion will use phosphorus limits that are applied as FWM TP values at structures discharging into the Park (Rule 62-302.540(4) (c), F.A.C., SFWMD 1992, Walker 1999, U.S. District Court 2001). The FWM TP concentration is the average concentration of phosphorus in solution, weighted proportionally for the volume flow during the sampling interval:

$$\text{FWM} = \frac{\sum (\text{Flow} \times \text{Concentration})}{\sum \text{Flow}} = \frac{\sum \text{Load}}{\sum \text{Flow}}$$

Typically, TP data are collected on a weekly basis at STA discharges while flow data are expressed as a daily average. When multiple discharge locations (e.g. structures G251 and G310) exist for a STA (e.g. STA-1W), one FWM TP concentration is calculated across all discharge locations to represent the overall STA discharge. This overall FWM is calculated as the total annual load across the multiple locations divided by the total annual flow across these multiple locations. For the Everglades marsh, the loading of nutrients such as phosphorus is an important consideration in evaluating and addressing the impacts on the water body. Once phosphorus is discharged into the Everglades, this mass or load of TP cycles within the Everglades marsh where it can continue to impact Everglades flora and fauna. The higher total TP load received

from higher flows may accumulate and affect the long-term observed concentrations in the marsh. Expressing the WQBEL as a FWM TP concentration includes consideration of not only concentration but load as well, and therefore, protects the downstream Everglades from phosphorus loads.

2.2 Database Development

2.2.1 STA Period of Record

The WQBEL was derived from statistical properties of STA discharges based on actual historical monitoring data for the period of record from May 1994 through April 30, 2010. The historical data set utilized in the derivation of the WQBEL is the same as was used by the United States Environmental Protection Agency (USEPA) in its Amended Determination of September 3, 2010 (USEPA 2010).

2.2.2 STA Monitoring Data and Collection Methods

In accordance with the water quality monitoring plans for each STA permit, grab or autosampling methods may be employed to collect TP samples at designated discharge compliance stations (locations). Also in accordance with each STA permit, flow calculations are developed at all designated compliance discharge stations. For some STAs, designated sample collection locations serve as surrogates for water quality monitoring at other adjacent structures discharging from the same flow-way or "outflow cell".

Annual and monthly mass loading and FWM TP concentrations at each designated discharge compliance station were calculated first based on the total observed flow at the discharge location (structure), coupled with both the grab and flow-proportional TP samples collected at the designated monitoring location over time identified in previous and current STA permits. Where multiple designated stations exist for a STA, an overall annual and monthly mass loading and FWM TP concentrations was also calculated for each STA to represent the combined discharge across the STA. While grab samples have been collected at locations not designated in the permits, these have been randomly collected over varying periods of record and at irregular frequencies. Therefore, annual FWM and GM outflow TP concentrations were calculated over the period of record for each STA, using only grab TP samples collected at the designated monitoring locations to maintain consistency with procedures used in reporting compliance with the existing permit discharge limits.

2.2.3 Data Set Compilation

The data for G-251, a discharge structure at STA-1West (STA-1W), were separated into two periods — Water Years 1995–2000 (WY1995–2000) and WY2001–2010 — to recognize the change in operation between the historic Everglades Nutrient Removal (E**N**R) Project and the more recent full STA-1W operation. A similar separation of STA-1W data was used in the derivation of the technology-based effluent limitation (TBEL) (Nearhoof et al. 2005) and the USEPA Amended Determination (USEPA 2010). Similarly, due to the reconfiguration of the STA-6 discharge canal completed in February 2001, flow and concentration calculations were prepared at the G-606 structure for the period of December 1997 through February 2001 and at

the G-354C and G-393B structures from March 2001 through April 2010. The initial data set consisted of 57 STA years (the sum of the years of data by STA). The initial data set of annual FWM and GM TP concentrations representing the combined discharge across all structures for each STA is provided in **Appendix 1**. **Table 1** shows the TP concentration and flow data periods of record for the individual STAs.

2.3 Data Screening

A quantitative approach was used to screen the annual outflow data from each STA. Based on the permits issued for each STA at the time of this derivation, the original design outflow limit for each STA was established not to exceed 50 ppb as an annual FWM. Therefore, annual FWM TP concentrations reported for each STA that did not exceed 50 ppb were used to derive the WQBEL presented herein. These data are expected to be more reflective of normal STA operation.

Table 1. Period of record of data for individual STAs.

STA	Structure(s)	Data Available			Water Years Omitted Based on Exceeding 50 ppb	Total Number of Water Years Used in Derivation
		Start Date	End Date	Water Years		
ENR	G-251	May 2, 1994	April 19, 2000	1995–2000	None	5
STA-1E	S-362	May 4, 2006	April, 30, 2010	2007–2010	2007 2010	2
STA-1W	G-251 G-310	May 2, 2000	April 30, 2010	2001–2010	2003 2005–2008	5
STA-2	G-335	August 5, 2001	April 30, 2010	2002–2010	None	9
STA-3/4	G-376B, E G-379B, D G-381B, E	May 6, 2004	April 30, 2010	2005–2010	None	6
STA-5	G-344 A, B, C, D, E, F	June 10, 2000	April 30, 2010	2001–2010	2001–2010	0
STA-6	G-606 G-354C G-393B G352B	December 1, 1997 (G-606) March 26, 2001 (G-354C, G-393B)	February 26, 2001 (G-606) April 30, 2010 (G-354C, G-393B, G352B)	1999–2010	2009	11

Using this screening protocol, 19 STA years of data were omitted from the derivation because annual FWM TP concentrations exceeded 50 ppb. In addition, all the data for STA-5 was omitted because during the 10 years of operation, outflow concentrations were consistently above 50 ppb. A complete list of water years by STA omitted from the derivation is provided in **Table 1**.

2.4 Data Rescaling

Since none of the STAs are currently discharging at a LTGM of 10 ppb, the existing data could not be used to directly determine the relationship between a LTGM and annual FWM TP concentration. Therefore, the existing TP data for each STA were rescaled individually to

simulate data from a hypothetical STA achieving a LTGM of 10 ppb. To accomplish this task, rescaling factors were calculated for each STA based on the available data. These rescaling factors were determined as the ratio of the LTGM of 10 ppb divided by the arithmetic average of the annual STA GM TP concentrations for the period of record (i.e., 10/average annual STA GM). As described above, the annual average GM TP concentrations in the STA discharges varied widely, ranging from 10 ppb at STA-6 discharge in WY2004 to 40 ppb in WY2008 at STA-6 outflow (**Table 2**).

Rescaling factors for the individual STAs ranged from 0.33 (10/30.8) for the STA-1W discharge to 0.64 (10/15.7) for the combined STA-3/4 discharges. These rescaling factors were then used to rescale annual FWM TP measurements for the corresponding STA. These rescaled annual FWM TP concentrations reflected the expected annual outflow FWM TP concentrations for each STA equivalent to a LTGM of 10 ppb. Rescaled annual FWM TP concentrations were calculated for each STA as follows:

- Calculating rescaling factor (RF) for each STA:

$$RF = \frac{LTGM}{\overline{GM}}$$

$$GM = \frac{\sum_{i=1}^{n} GM}{n}$$

Where,

LTGM = long-term geometric TP mean of 10 ppb

GM = geometric mean for each year at STA

$\overline{GM}$ = arithmetic mean of geometric mean at STA for n years

n = number of years per STA

- Calculating rescaled FWM TP for each STA:

Rescaled FWM = FWM × RF

Where,

FWM = outflow FWM calculated for each at STA (across all structures)

Table 2. Annual GM in micrograms per liter (µ/L) or ppb, FWM in µ/L or ppb, outflow in 1,000 acre-feet (ac-ft x 10^3) and rescaled FWM TP concentrations in µ/L or ppb for STA outflow structures. Rescaling factors (RF) for each STA are shown in parentheses.

STA	Water Year	GM TP (µg/L or ppb)	FWM TP (µg/L or ppb)	Outflow (ac-ft x 10^3)	Rescaled FWM TP (µg/L or ppb)
ENR (RF = 0.489)	1996	23.6	23.9	172.4	11.7
	1997	19.6	18.7	119.2	9.1
	1998	20.5	21.3	81.0	10.4
	1999	19.4	19.2	86.4	9.4
	2000	19.0	25.1	121.2	12.3
Average		20.4	22.0	116.0	10.8
STA-1E (RF = 0.537)	2008	18.1	20.3	125.4	10.9
	2009	19.1	21.1	149.1	11.3
Average		18.6	20.7	137.2	11.1
STA-1W (RF = 0.325)	2001	25.3	38.7	90.5	12.6
	2002	26.9	37.0	267.6	12.0
	2004	38.5	46.5	297.6	15.1
	2009	27.2	35.5	187.2	11.5
	2010	36.1	40.2	221.1	13.1
Average		30.8	40.2	212.8	13.1
STA-2 (RF = 0.587)	2002	16.6	16.4	240.7	9.6
	2003	14.5	17.8	308.3	10.4
	2004	11.4	14.3	284.8	8.4
	2005	15.0	20.2	371.0	11.8
	2006	17.7	20.7	322.3	12.2
	2007	23.3	41.0	217.6	24.1
	2008	18.2	21.7	227.0	12.8
	2009	16.5	18.1	291.4	10.6
	2010	20.2	36.7	371.3	21.5
Average		17.0	22.9	292.7	13.5
STA-3/4 (RF = 0.639)	2005	12.5	13.0	646.6	8.3
	2006	18.7	23.4	736.4	14.9
	2007	18.7	22.4	355.4	14.3
	2008	18.2	20.1	296.2	12.9
	2009	11.8	13.0	459.4	8.3
	2010	14.0	14.9	637.2	9.5
Average		15.7	17.6	521.9	11.2
STA-6 (RF= 0.505)	1999	13.8	21.6	24.0	10.9
	2000	12.7	14.9	59.3	7.5
	2001	25.5	36.2	26.1	18.3
	2002	12.5	15.9	22.3	8.0
	2003	14.1	25.7	26.1	13.0
	2004	10.0	11.6	29.0	5.9
	2005	13.7	19.0	16.3	9.6
	2006	28.3	25.3	23.2	12.8
	2007	20.9	44.6	11.5	22.5
	2008	40.2	35.9	1.7	18.1
	2010	26.2	49.3	74.8	24.9
Average		19.8	28.2	28.6	14.2

Because the available TP data for many of the STAs was limited, the data were pooled across all STAs to provide a better estimate of the variability in TP concentrations in the discharge of the

STAs under different conditions. As described above, the data for each individual STA were rescaled prior to pooling to provide a comparable basis for combining the data across the STAs and the evaluation of the variability.

2.5 Statistical Analysis

Using the pooled rescaled data set, the TP WQBEL for the EPA discharges (expressed as an annual FWM TP concentration limit) was then calculated separately for each rescaling method using a procedure similar to that utilized in the derivation of the TBEL (Nearhoof et al., 2005). The WQBEL estimates were derived by fitting log-normal frequency distributions to the rescaled annual FWM concentration data for the pooled STA data set as follows:

$$y_{ij} = \ln(C_{ij})$$

$$m = \frac{\sum_{i=1}^{k}\sum_{i=1}^{n_i} y_{ij}}{N}$$

$$S^2 = \frac{\sum_{i=1}^{k}\left[\sum_{j=1}^{n_i}(y_{ij} - \bar{y}_i)^2\right]}{N - k}$$

$$df = N - k$$

$$L_p = e^{(m+S_y \cdot t_p)}$$

Where,

C_{ij} = FWM for year j and STA i, rescaled to a LTGM is 10 ppb
$\bar{y}_i$ = mean ln(FWM) for STA i across years
N = total number of STA years
k = number of STAs
m = mean of log-normal TP data across STAs and years (rescaled FWM)
S_y^2 = pooled year-to-year variance across STAs and years
S_y = pooled year-to-year standard deviation
df = degrees of freedom in s
L_p = limit FWM concentration with exceedance probability *p*
t_p = 1-tailed t-statistic, significance level *p* and degrees of freedom df
p = 0.10

(Adapted from Payne et al. 2010 and USEPA 2010)

In this WQBEL derivation, the method uses the 90th percentile of the data distribution to derive a maximum annual limit. The annual maximum (AWFM) WQBEL is set at the 90th percentile of the frequency distribution of annual FWM values. An annual FWM above the 90th percentile would have only a 10 percent chance of occurring within the expected range of annual values from a long-term reference distribution of phosphorus discharge data that is centered around a GM TP concentration of 10 ppb and translated into a FWM discharge TP concentration.

Table 3 statistically summarizes the rescaled LTGM and FWM TP data for each STA and as a pooled value to be used as a long-term limit. **Table 4** provides the results of the statistically derived AWFM TP limit and the expected LTFWM TP limit that will comprise the proposed WQBEL. Both the annual maximum (AWFM) and long-term (LTWFM) limits are based on the existing pooled data set for the STA discharges using the aforementioned rescaling methodology.

Table 3. Statistical summary of rescaled LTGM and LTFWM TP discharges to the EPA.

STA	Number of Water Years	LTGM TP (µg/L or ppb)	LTFWM TP (µg/L or ppb)	Ratio FWM/GM
ENRP	5	10	10.8	1.06
STA1E	2	10	11.1	1.11
STA1W	5	10	13.1	1.30
STA2	9	10	13.5	1.29
STA3/4	6	10	11.2	1.12
STA6	11	10	14.2	1.37
All STAs	*38*	*10*	*12.8*	*1.25*

Table 4. Derivation of the WQBEL for TP in discharges to the EPA.

Parameter	Value	Description
Number of STAs	6	*k*
Number of STA Years	38	*N*
Degrees of Freedom	32	*df = N-k*
LTFWM for LTGM = 10	12.8	*Average rescaled LTFWM across STAs and years equivalent to GM =10 ppb*
Standard Error of LTFWM	0.6	*Standard error of rescaled LTFWM across STAs and years*
Annual Ln Mean FWM	2.48	*m = mean (Ln rescaled FWM)*
Annual Ln Standard Deviation FWM	0.325	*std = standard deviation (Ln rescaled FWM)*
Annual Pooled Ln Standard Deviation FWM	0.350	*s = pooled standard deviation (Ln rescaled FWM)*
Assumed Tail Probability	0.1	$p_{0.1}$ *= probability for 90% prediction*
Students-t	1.31	$t_{0.1} = (p_{0.1}, DOF)$, *1-tailed*
Annual Maximum FWM Limit (AWFM)	18.9	$Limit = exp(m + s*t_{0.1})$
Mean Ratio FWM/GM	1.25	*Mean of FWM/GM*

3.0 Results and Discussion

The WQBEL presented here for the STA discharges assures compliance with the 10 ppb LTGM TP criterion for the Everglades. The proposed WQBEL for STA discharge into the EPA has two parts, both of which must be met. TP concentrations in the discharge from each STA may not exceed either of the following:

- Part 1 (LTWFM): 13 ppb as an annual FWM in more than three out of five years
- Part 2 (AFWM): 19 ppb as an annual FWM

The WQBEL, through the rescaling methodology, has been derived to be approximately equivalent to the 10 ppb LTGM TP criterion for the Everglades and it is directly applied to the discharge from each STA. In the case of multiple discharge structures from a STA, the AFWM limit (19 ppb) and LTFWM limit (13 ppb) will be applied to the annual FWM TP concentration across all discharge locations identified in the STA permit, resulting in one annual FWM reported for the STA. Compliance with the WQBEL is determined on an annual basis. Additionally, for compliance purposes, the WQBEL and annual results will be rounded to the nearest integer. (i.e., a calculated AFWM of 10.5 ppb shall be reported as 11 ppb; 10.49 ppb shall be reported as 10 ppb).

The first part (LTFWM) of the WQBEL requires that 13 ppb as an annual FWM is not exceeded in more than three of five consecutive years. This part of the test is based directly upon a translation of the LTGM TP criterion of 10 ppb to the historical STA discharge data. This part of the WQBEL is expressed as a FWM because it represents the central tendency of STA outflow discharges to the Everglades. Translating the 10 ppb LTGM to a FWM maintains consistency with the Everglades TP criterion test expressed as a GM, and provides consistency with the second part of the test (an annual maximum limit expressed as a FWM concentration).

The second part (AFWM) of the WQBEL, a maximum annual discharge limit of 19 ppb, is needed to assess annual compliance and to assure that STA discharges do not cause exceedances of the TP criterion in the EPA. The methodology used to derive the annual maximum discharge limit is similar to that used in previous derivations of the interim STA limit of 50 ppb (Walker 1996, Nearhoof et al. 2005) and in previous WQBEL derivations (Payne et al. 2005, 2008, 2010, USEPA 2010).

4.0 References

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Appendix 1.
Available annual outflow TP and flow data for each STA. Bolded values identify data less than or equal to 50 ppb (as a flow-weighted mean) used in the WQBEL derivation.

STA	Water Year	Geometric Mean TP (µg/L or ppb)	Flow-Weighted Mean TP (µg/L or ppb)	Outflow (ac-ft x 10^3)	Less than or Equal to 50 µg/L as a Flow-Weighted Mean
ENRP	**1996**	**23.6**	**23.9**	**172.4**	**Yes**
	1997	**19.6**	**18.7**	**119.2**	**Yes**
	1998	**20.5**	**21.3**	**81.0**	**Yes**
	1999	**19.4**	**19.2**	**86.4**	**Yes**
	2000	**19.0**	**25.1**	**121.2**	**Yes**
STA1E	*2006*	*63.1*	*145.8*	*40.6*	
	2007	*38.5*	*71.5*	*97.8*	
	2008	**18.1**	**20.3**	**125.4**	**Yes**
	2009	**19.1**	**21.1**	**149.1**	**Yes**
	2010	*55.4*	*93.8*	*89.1*	
STA1W	**2001**	**25.3**	**38.7**	**90.5**	**Yes**
	2002	**26.9**	**37.0**	**267.6**	**Yes**
	2003	*46.1*	*53.4*	*596.0*	
	2004	**38.5**	**46.5**	**297.6**	**Yes**
	2005	*67.8*	*98.3*	*383.4*	
	2006	*84.1*	*113.3*	*137.9*	
	2007	*76.4*	*118.8*	*126.2*	
	2008	*42.2*	*52.7*	*117.0*	
	2009	**27.2**	**35.5**	**187.2**	**Yes**
	2010	**36.1**	**40.2**	**221.1**	**Yes**
STA2	**2002**	**16.6**	**16.4**	**240.7**	**Yes**
	2003	**14.5**	**17.8**	**308.3**	**Yes**
	2004	**11.4**	**14.3**	**284.8**	**Yes**
	2005	**15.0**	**20.2**	**371.0**	**Yes**
	2006	**17.7**	**20.7**	**322.3**	**Yes**
	2007	**23.3**	**41.0**	**217.6**	**Yes**
	2008	**18.2**	**21.7**	**227.0**	**Yes**
	2009	**16.5**	**18.1**	**291.4**	**Yes**
	2010	**20.2**	**36.7**	**371.3**	**Yes**

Appendix 1 (Continued).
Available annual outflow TP and flow data for each STA. Bolded values identify data less than or equal to 50 ppb (as a flow-weighted mean) used in the WQBEL derivation.

STA	Water Year [a]	Geometric Mean TP (µg/L or ppb)	Flow-Weighted Mean TP (µg/L or ppb)	Outflow (ac-ft x 10^3)	Less than or Equal to 50 µg/L as a Flow-Weighted Mean
STA3/4	**2005**	**12.5**	**13.0**	**646.6**	**Yes**
	2006	**18.7**	**23.4**	**736.4**	**Yes**
	2007	**18.7**	**22.4**	**355.4**	**Yes**
	2008	**18.2**	**20.1**	**296.2**	**Yes**
	2009	**11.8**	**13.0**	**459.4**	**Yes**
	2010	**14.0**	**14.9**	**637.2**	**Yes**
STA5	*2001*	*75.0*	*99.3*	*40.0*	
	2002	*64.8*	*82.7*	*126.2*	
	2003	*113.1*	*133.6*	*160.5*	
	2004	*90.3*	*97.5*	*136.5*	
	2005	*62.2*	*81.6*	*121.4*	
	2006	*99.6*	*95.4*	*200.9*	
	2007	*130.8*	*192.5*	*54.2*	
	2008	*76.0*	*95.7*	*7.1*	
	2009	*36.9*	*55.8*	*106.2*	
	2010	*43.2*	*51.2*	*96.6*	
STA6	**1999**	**13.8**	**21.6**	**24.0**	**Yes**
	2000	**12.7**	**14.9**	**59.3**	**Yes**
	2001	**25.5**	**36.2**	**26.1**	**Yes**
	2002	**12.5**	**15.9**	**22.3**	**Yes**
	2003	**14.1**	**25.7**	**26.1**	**Yes**
	2004	**10.0**	**11.6**	**29.0**	**Yes**
	2005	**13.7**	**19.0**	**16.3**	**Yes**
	2006	**28.3**	**25.3**	**23.2**	**Yes**
	2007	**20.9**	**44.6**	**11.5**	**Yes**
	2008	**40.2**	**35.9**	**1.7**	**Yes**
	2009	*38.0*	*93.4*	*42.3*	
	2010	**26.2**	**49.3**	**74.8**	**Yes**

Footnote:
[a] Flows and flow-weighted mean TP concentration data compiled in 2010 and summarized in Chapter 5 of the 2011 South Florida Environmental Report.