

City of Tallahassee's Sufficiency of Effort and Pollutant Load Reduction Summary

Position and Recommendations Regarding the Sufficiency of Effort Approach for the Upper Wakulla River Basin Management Plan

1. Introduction

1.1. TMDL Requirements

The Department of Environmental Protection (DEP) adopted a TMDL for nitrate-nitrogen to address biological impairment in the Upper Wakulla River and Wakulla Springs (UWR) on Jan. 11, 2012. The following is an excerpt from the Notice of Proposed Rulemaking that explains the intent and magnitude of pollutant reduction goals established by DEP.

"The nitrate TMDL to address the biological impairment is an in-stream monthly mean concentration of 0.35 mg/L and is allocated as follows: The WLA for wastewater sources is not applicable. (b) The WLA for discharges subject to the DEP's NPDES Municipal Stormwater Permitting Program is not applicable. (c) The LAs for nonpoint sources are to address anthropogenic sources in the basin such that in-stream nitrate concentrations meet the TMDL target, which, based on the mean concentrations from the 2002-2007 period, will require a 56.2 percent reduction of nitrate at sources contributing to the observed biological impairment. (d) The Margin of Safety is implicit. (e) While the WLA and LAs for nitrate have been expressed as the concentration and percent reduction needed to attain the applicable Class III biology criterion, it is the combined reductions from both anthropogenic point and nonpoint sources that will result in the required reduction of in-stream nitrate concentrations." The DEP mandate presumes that if all other factors remain constant a reduction in total nitrogen applied to the land surface will translate to an equivalent reduction in Nitrate (N) associated with that specific source.

As noted above, the TMDL does not express allocations for point source discharges of wastewater or stormwater. However, the load allocation for nonpoint sources (NPS) requires a 56.2% reduction of nitrogen (N) at sources contributing to the impairment. Similar to onsite disposal systems (OSDS or septic tanks), DEP has determined that the City of Tallahassee (City) wastewater disposal at the Southeast Sprayfield (SESF) constitutes a NPS that contributes to the impairment and is thus subject to pollutant load reduction goals.

1.2. Efficacy of Sufficiency of Effort Method

It appears the Sufficiency of Effort (SE) method may have the capacity to achieve the water quality improvement necessary, however, it lacks adequate provisions to ensure equitable allocation of load reduction goals as required under the Florida Watershed Restoration Act. Measures could be incorporated to address this shortcoming but absent such a remedy the SE approach would not meet the requirements of the Watershed Restoration Act.

The SE method is consistent with the State's ongoing Non-Point Source (NPS) management strategy in which pollutant load reduction requirements are met with the application of Best Management Practices (BMPs) to the Maximum Extent Practicable (MEP). As a consequence of such an approach, the sufficiency of measures to reduce non-point sources are normally characterized as presumptive, based on estimated or assumed load reductions and levels of implementation, without verification.

Under the iterative BMAP process currently proposed, if water quality does not improve as anticipated, additional reduction strategies would be expected of stakeholders in the future. Such an approach works when all sources (stakeholders) are at the same level of involvement and implementation. However, when water quality restoration actions are implemented primarily by a few or a single stakeholder, the proposed sufficiency of effort approach can lead to significant inequity among stakeholders. In such a situation, less proactive stakeholders benefit from the reductions achieved by those that fund significant actions. Worse yet, should future additional reduction strategies prove necessary, the proactive could again be confronted with additional reductions when the less proactive have yet to make any significant contribution to the effort. Such an outcome is clearly not equitable. Equitable allocation of load reduction goals is required under the Florida Watershed Restoration Act and for this reason we believe that if the SE approach is to be used in the BMAP, then measures must be included in the BMAP to address this issue.

It is the City's observation that the SE measures expected of other sources of nitrate under the proposed BMAP, appears to be nominal when compared to the City's investment and achievement. As currently proposed the SE based BMAP is providing credit for management strategies that are either on-going routine practices or which minimally enhanced future activities. It does not appear the SE will require any measures with substantive benefit in terms of nitrate reduction, beyond that which is already underway by the City of Tallahassee.

To address the above described equity issue associated with SE method the BMAP needs to incorporate documentation of stakeholder reductions when these can be substantiated as directly related to improved water quality in the UWR. The BMAP needs to acknowledge credit for these reductions and provide safe harbor from

additional reduction requirements until such time as other stakeholders achieve comparable proportional reductions.

Such an approach is necessary to carry out the Department's intent to level the playing field as stated in A Report to the Governor and the Legislature on the Allocation of Total Maximum Daily Loads in Florida (February 1, 2001). Although the City's discharge to the SESF is technically a non-point source the City plays the same role as a large visible point source that has committed extensive efforts and expenditures to reduce pollutant loads, in this case nitrate. Other non-point sources should be expected to provide comparable substantive levels of treatment before any additional reductions or increased treatment is required of the City. The City has provided language, found in the Conclusion section of this paper, for DEP to incorporate into the BMAP document, which will address the inequities as to the allocation mentioned above.

2. Documentation of Load Reduction Credit

The purpose of this section is to provide documentation of the level of effort and load reductions achieved by the City's various initiatives especially its proactive wastewater treatment upgrades. It will be demonstrated that the City's actions in improving operational practices, the upgrade to Advanced Wastewater Treatment (AWT), and measures taken for planned growth exceed the 56.2% reduction, at sources contributing nitrate, required by the TMDL.

2.1. Multiple Reduction Strategies

The City has sufficient information to provide numeric expressions of accomplishments and load reductions especially regarding wastewater. The following reiterates City's on-going and completed initiatives for the Wakulla BMAP Nitrogen Management Strategies, and includes: Fertilizer Ordinance; Pet Waste Ordinance; Assessment and Rehabilitation of Wastewater Collection System; Public Education; Primary Springs Protection Zone Ordinance; Comprehensive Plan requirements, and structural stormwater quality enhancement projects. Because DEP has indicated that the above non-wastewater related efforts will also be an integral element of the Lake Munson/Munson Slough TMDL/BMAP we do not intend to develop loading reductions at this time, particularly to groundwater.

2.2. Wastewater Source Reduction

The City's wastewater management practices and infrastructure have been substantially enhanced to reduce nitrate loading. These wastewater treatment improvements were implemented at great expense to the Tallahassee community. For this reason, and because wastewater treatment processes by their nature allow accurate load reduction quantification, the City will document the achieved load reductions.

Two components of wastewater treatment have been eliminated completely (i.e., land application of biosolids in the springshed and fertilizer application to crops at the

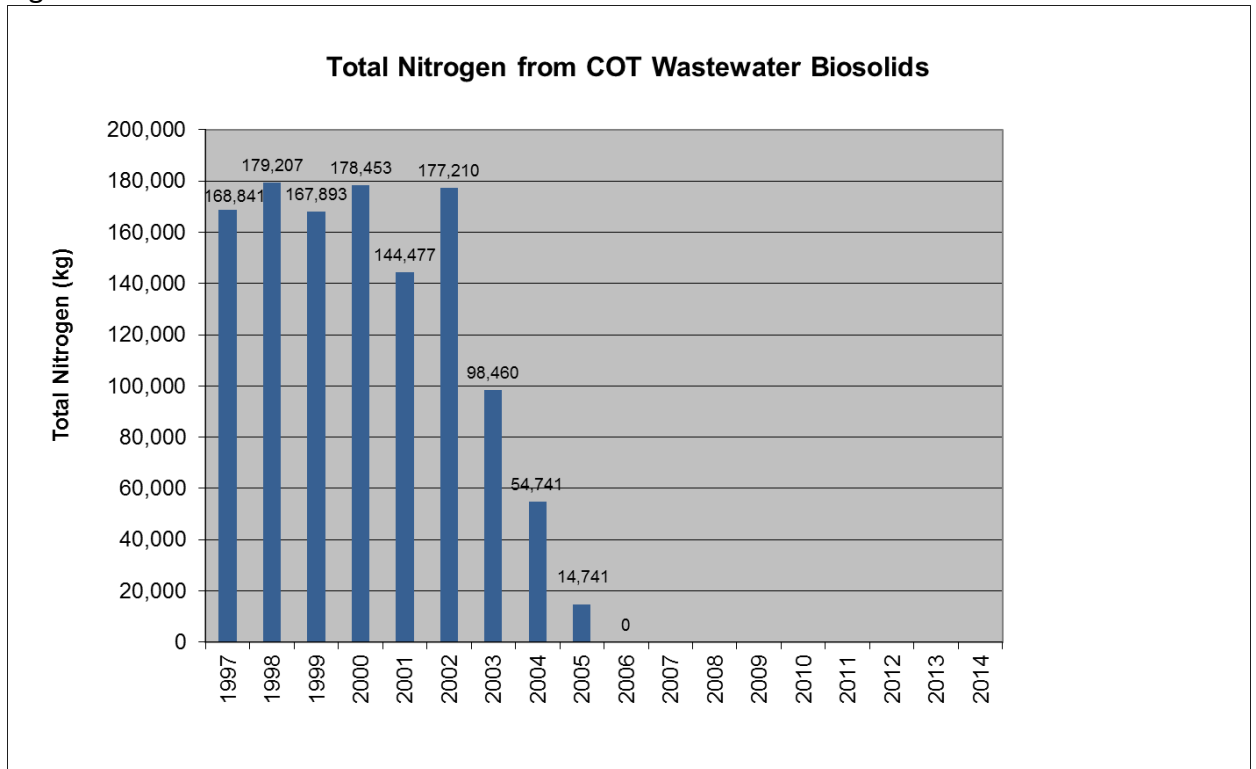
sprayfield farm). To determine the reductions from each of these sources, wastewater residuals disposal and tracking records, as well as fertilizer application data maintained by the contract farmer (J.L. Morgan & Sons), were compiled and evaluated by City staff. The average annual nitrogen loading associated with each of these sources applied within the springshed was calculated for the base period, defined as the time period when no reduction efforts were being implemented.

2.3. Biosolids Reduction

Relative to biosolids disposal, the average annual total nitrogen (TN) load during the years 1997 – 2002, prior to nitrogen reduction by the City, was 169,347 kg/yr. During the next four years, from 2002 – 2006 this source load was sequentially reduced with total elimination at this source being achieved in 2006 (Figure 1). This load reduction was accomplished by initiating the export of residuals to areas outside the springshed. The purchase and installation of a \$2 million biosolids dryer in 2004 helped to facilitate this load reduction operational change. Annual operating costs associated with this disposal method continue to accrue each year. An additional \$16 million was invested in a dryer upgrade in 2012.

As mentioned above, this operational change in the handling of biosolids has resulted in 100% removal of this source. Therefore, the BMAP credit for biosolids removal would be 169,347 kg/yr TN.

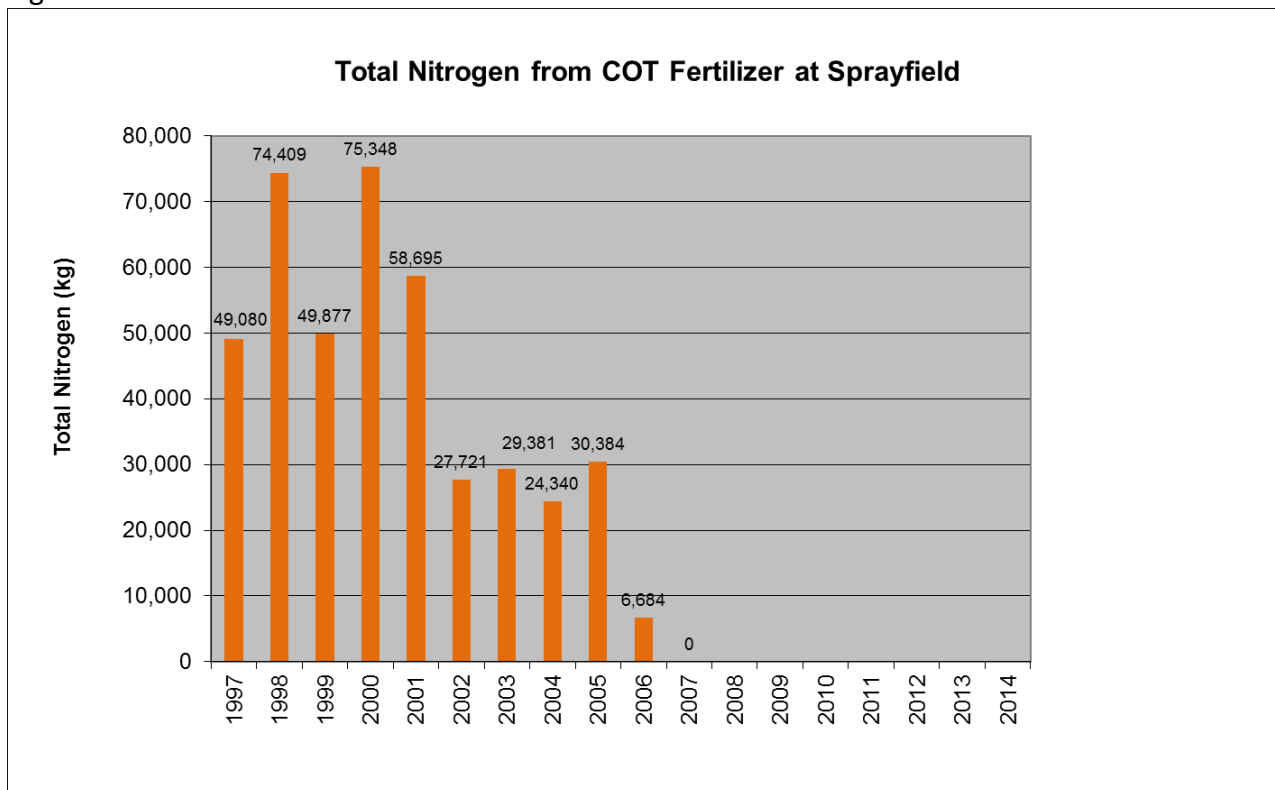
Figure 1.



2.4. SESF Fertilizer Reduction

Commercial fertilizer used, to augment crop growth, was also sequentially reduced with total elimination of this source being achieved in 2006 (Figure 2). Usage from 1997 to 2001 (i.e., the base period when no reductions were being implemented) averaged 61,482 kg/year TN. Over the next six years, fertilizer application was reduced incrementally. Load from fertilizer products has been totally eliminated since 2007. Therefore, the BMAP credit for the complete elimination of agricultural fertilizer use at the SESF would be 61,482 kg/yr TN.

Figure 2.



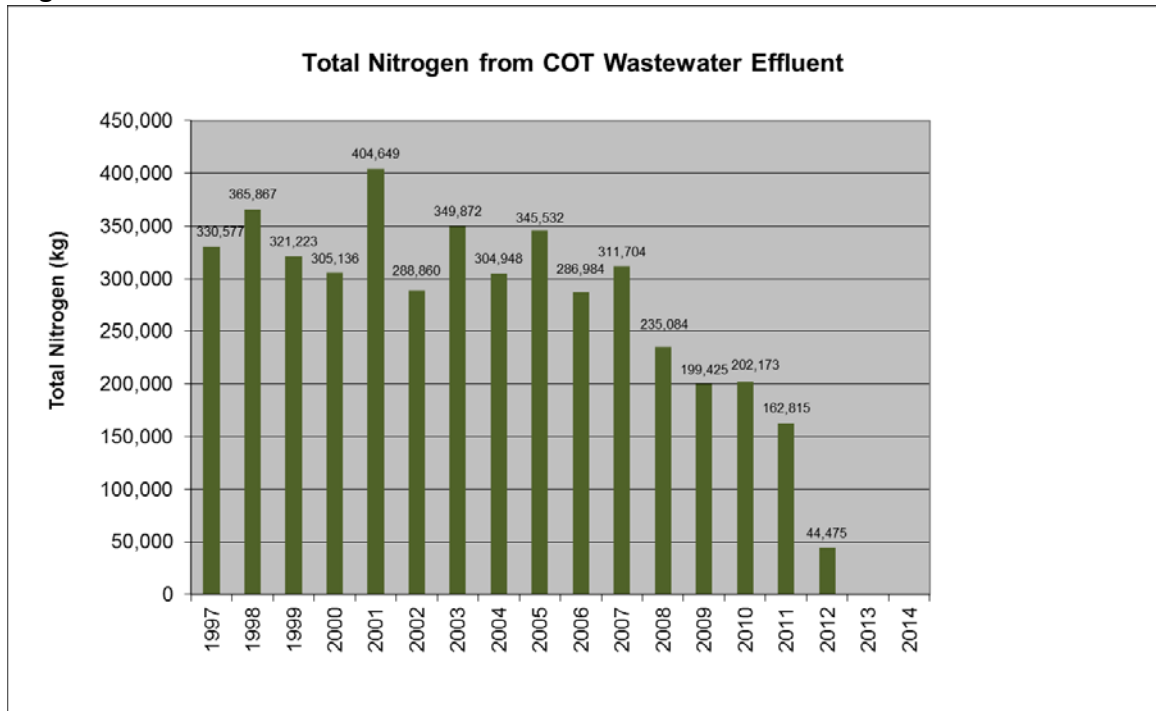
2.5. Effluent Load Reduction Associated with AWT Wastewater Plant Upgrade

Clearly, the most significant effort by the City (and its residents) to reduce nitrogen in the springshed was the \$227 million upgrade to AWT standards at the T.P. Smith Water Reclamation Facility (TPS). This upgrade to Best Available Technology (BAT), specified by EPA and DEP to reduce total nitrogen concentration in the effluent land applied at the sprayfield to 3 mg/L, represents a reduction of 75%, from an initial value of 12 mg/L TN. To determine the load reduction associated with the AWT investment, staff used historical discharge monitoring reports compiled by the City for DEP. Results are shown in Figure 3.

Prior to the upgrade, during the years 2000 to 2007, the average yearly TN effluent load applied at the SESF was 324,711 kg/yr. Beginning in 2008, through chemical treatment,

process changes and start-up phases of the AWT upgrade, the quality of the wastewater effluent concentration improved at a rate that surpassed permit requirements. By 2012 monitoring reports verify the City's effluent concentration averaged less than the 3 mg/L TN target set by DEP for the plant upgrade. The target limit was reached two years ahead of the schedule. The reduction amount of 214,939 kg/yr TN was calculated by subtracting the maximum permitted capacity (26.5 MGD at 3 mg/L TN) loading value from the annual average during the base period years (324,711 kg/yr – 109,772 kg/yr allowable load TN). This represents a 66% reduction.

Figure 3.



It should be pointed out that the actual reduction today is much greater 66%. The 66% reduction is calculated based on the currently permitted plant flow of 26.5 MGD. That flow is not projected to be reached until 2033. The actual reduction that has been achieved today is much greater because the flow and concentration are both less than permitted values. For example, during 2012 the effluent concentration had been reduced to less than 3 mg/L TN, the annual average flow was just under 17 MGD, and the actual load applied was 44,461 kg/yr. Those actual values represent an 86% reduction when compared to the average annual base period loading. This helps to point out why DEP needs to include provisions in the BMAP to document reductions achieved and excess reductions reserved for future impacts.

2.6. Wastewater Load Reduction Summation

The combined base period loads from these three sources total 555,539 kg/yr TN. The

combined nitrogen load reduction achieved through the three management efforts discussed above totals 445,767 kg/yr TN. Therefore these efforts have resulted in an 80% overall load reduction from the baseline load applied in the Primary Springs Protection Zone from wastewater related activities. Clearly the City has exceeded the TMDL reduction level (i.e., 56.2%) required at sources, as cited in the rulemaking language in the Introduction section of this assessment report. Once again, it needs to be pointed out that the cumulative 80% reduction is calculated using the 26.5 MGD permitted flow for the treatment plant. Therefore it already allows for a 39,040 kg/yr increase in load as the treatment plant flow increases to permitted capacity.

The City requests that DEP document a credit in the BMAP to maintain equitability as the iterative BMAP process continues. This credit should be defined as the difference between the overall percent load reduction minus the percentage reduction required by the TMDL. In this instance the City has removed an additional 24% or 133,554 kg/yr TN, beyond that which was found necessary during TMDL development. It should be noted that the City's ongoing AWT treatment plant project includes components that are hydraulically sized for a later expansion to 31 MGD. The excess load reduction of 133,554 kg/yr should be documented as available to the City for future expansion of its treatment plant beyond 26.5 MGD and for application toward potential reductions specified for other City operations.

Below is language the City requests be included in the BMAP to address this issue:

The Department recognizes that due to the iterative nature of an adaptive management approach there is a potential for inequities to develop between stakeholders who have made substantial load reductions and those that will not do so until a subsequent phase. Because equitable allocation of load reduction goals is a requirement for all BMAPs under the Florida Watershed Restoration Act, the Department has incorporated measures to address the differences in timing and magnitude of load reduction achievements. The statutory provisions guiding BMAP development provide for assigning load reduction credits to dischargers that have implemented load reduction strategies. When a stakeholder undertakes projects or activities that can be substantiated as directly related to reducing TN in the UWR and said reductions can be reliably quantified, reduction credits will be given to the stakeholder through the BMAP process. Stakeholders with substantial credits will not be required to address additional load reductions until such time as other sources achieve comparable proportional reductions.

The City believes the requested language will provide adequate remedy to the equity issue inherent to the Sufficiency of Effort approach. As always, the City appreciates the opportunity to work with DEP toward the goal of improving water quality and protecting our local natural resources.