# Clean Water Network of Florida
# Conservancy of Southwest Florida
# Sanibel Captiva Conservation Foundation

September 4, 2008

Dr. Nathan Bailey
Bureau of Watershed Management
Twin Towers Office Building - Room 238
2600 Blair Stone Road, MS # 3555
Tallahassee, Florida 32399-2400

Dr. Bailey:

As your office continues its efforts to modify and ultimately develop a model for the Caloosahatchee River TMDL, the Clean Water Network of Florida, Conservancy of Southwest Florida, and Sanibel Captiva Conservation Foundation would like the opportunity to collectively submit the following comments for the record, prepared by TMDL Technical Working Group members from these organizations, as well as Dr. Victor J. Bierman (consultant for Clean Water Network of Florida).

Additionally, we request that there be another workshop meeting *prior* to the first public hearing in order to allow the Technical Working Group to provide substantive input to Scenarios 2 and 3 which were not prepared in time for the last meeting, as well as to review and comment on the following suggested additional scenarios and to work with the FDEP to resolve our collective outstanding concerns prior to the public hearing process. In order to assure that the model outcomes and TMDLs are comprehensive, representative and based on the best available science, we urge you to incorporate the following additional measures to ensure that the TMDL modeling results in viable and protective TMDL standards that can lead to BMAP solutions that will accurately identify solutions for meeting that TMDL.

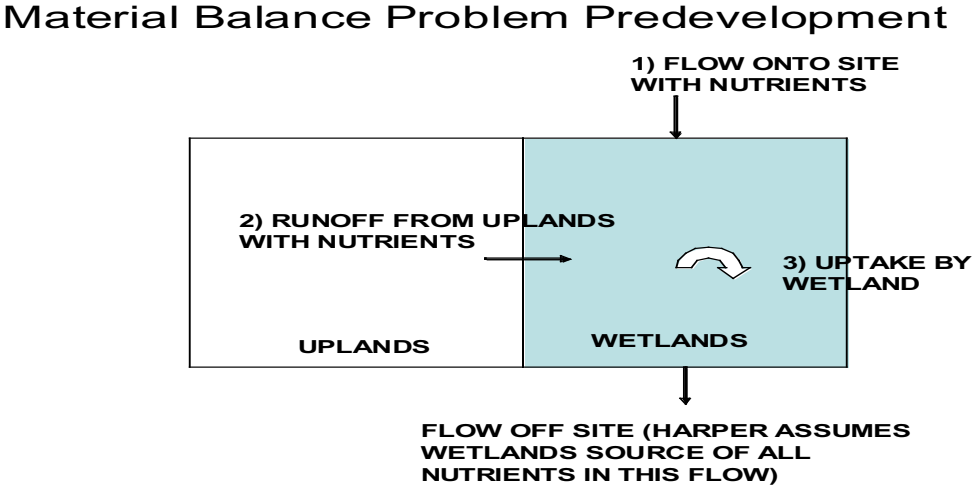
## Calibrating Model to Accurately Depict Wetland Land Uses as Non-polluting

As discussed at the last TMDL meeting, we request that wetland loading rates be zero for all wetland land use areas in all applications for this modeling analysis, including both the pre-development and existing land use conditions. This analysis would be aimed at addressing a concern that the TMDL is inaccurately attributing a positive pollutant loading rate to the wetlands land uses in the pre-development and existing conditions modeling analysis. These loading rate assumptions are being based on the "2003 Evaluation of Alternative Stormwater Regulations for Southwest Florida," a report which was the subject of two critical peer reviews: one by a panel of stormwater experts convened by the U.S. Environmental Protection Agency, and the other by Florida's own Department of Environmental Protection. These peer reviews severely criticized several components of the methodology, including the assumed high removal efficiencies for nutrient pollution in wet detention ponds and the assumption that wetlands in their natural condition should be considered a predevelopment land use contributing nutrient pollution to waters of the United States.

The author himself, Harvey Harper, has repudiated portions of his 2003 version of the methodology and has revised it in a recent report to the Florida Department of Environmental Protection, entitled "Evaluation of Current Stormwater Design Criteria within the State of Florida, Final Report (June 2007)."[1] One of the faulty assumptions

1 In a recent administrative hearing concerning the SFWMD permit for Mirasol, Harper testified that he would not rely upon his 2003 version of the methodology. (Excerpts attached).

in the 2003 report that remains in the 2007 Harper Methodology is that wetlands have a positive annualized average nutrient loading rate, rather than a nutrient load reduction effect commonly referred to by wetland ecologists as wetlands "sinks". This is due to the Harper Methodology's failure to account adequately for wetland ecology and its impact on the mass balance nutrient output from wetlands (refer to Figure below).




Because wetlands take runoff from adjacent upland land uses, they can have a significant amount of input in nutrient pollution loading. Wetlands are nutrient reducers - they uptake more nutrients than they produce, *notwithstanding the fact that they may seasonally temporarily naturally export nutrients*, on an annualized average That is why created wetlands have been widely used for nutrient reduction, such as the Stormwater Treatment Areas in the Everglades Restoration area. However, these created wetlands require maintenance in order to maintain their efficiency in removing nutrients because wetlands can become saturated and reach their assimilative capacity whereupon they can no longer absorb any more nutrients, and then the nutrient load input begins to pass through unabsorbed. The Harper methodology has been employed to simply take the nutrient concentration values in such wetlands and attribute it as the nutrient load value from natural wetlands, rather than attributing it accurately to the adjacent land uses from which the nutrients originated. What this in fact does is inflate the predevelopment nutrient loading rates for developments that have natural wetlands on-site; thus requiring less load reduction (i.e. treatment) post-development.

As the 2003 Harper report and methodology was the subject of two highly critical peer reviews, and contains faulty assumptions and approaches that are currently acknowledged by (1) the author, (2) the Environmental Protection Agency, and (3) the South Florida Water Management District, we strongly object to these wetland load rates being employed in the development of the Caloosahatchee TMDL, or any other TMDL. Therefore, we strongly suggest running scenario(s) where wetland land uses are not attributed a positive pollutant load value. We also urge FDEP to attribute a zero or negative loading rate for natural wetland land use categories for all analysis and TMDL efforts going forward.

### Calibrating Model for More Accurate BMP Implementation Rate

As discussed at the last TMDL meeting, there is a great deal of concern that an unrealistic and inaccurately high level of agricultural BMP implementation is being assumed for the purposes of the modeling analysis in the development of this TMDL. Because there is little data to support the actual implementation rate and the pollutant removal efficiencies of such BMPs, we would request that the model be calibrated to create a more conservative analysis which includes *only* BMPs that are required and enforceable through a permit by a regulatory agency because in fact, these are the only BMPs which could realistically be assumed to actually be implemented and maintained.

Additionally, there needs to be further development of the section devoted to agricultural BMPs, to define untypical terms such as "water table management BMP". As the consultant acknowledged at the last TMDL meeting, this section was "not very well written". We suggest that this section be intensively reworked to clarify the logic and assumptions being made with regard to integrating agricultural BMP information into the modeling and analysis for the development of this TMDL. Urban BMP categories need to be clearly defined and supported as well, to clarify how they are being applied in the modeling and analysis of this TMDL.

### Need for Modeling Additional Scenarios

Dr. Bierman has expressed that it is very important to use a calibrated model for diagnostic analyses designed to better understand the nutrient dynamics of a system before using it to conduct "real" TMDL management forecast scenarios. Furthermore, Dr. Bierman believes a good way to conduct such analyses is to "isolate" (i.e. 'turn on') one loading source category at a time, as opposed to running the model with one loading source category "turned off." We think results from such "isolation runs" much better illustrate the influence (or lack of influence) of the target source category, because model results are not confounded by the influence of multiple, simultaneous loads from other categories. Another benefit is that results from an "isolation run" can indicate whether or not the nutrient load from that single source category by itself can cause non-achievement of TMDL targets.

To that end, we have asked Dr. Bierman to prepare several proposed "diagnostic scenarios" with the calibrated TMDL model. We strongly encourage the Department of Environmental Protection to run the following scenarios for different categories of "isolated" sources:

### 1. Scenario I: Isolation Run for Lake Okeechobee

All other loading sources set at ZERO including the downstream boundary (Gulf of Mexico), atmospheric wet plus dry deposition, point sources, tributaries and distributed runoff. Sediment initial conditions should be the same as those in the base calibration.

The purpose of this run would be to determine the influence of Lake Okeechobee as the sole external loading source. This is important because Lake Okeechobee nutrient loadings cannot be changed by management actions within the Caloosahatchee Watershed. It is also important because it may be learned that Lake Okeechobee nutrient loadings alone could result in non-achievement of the TMDL water quality targets. This is another reason for using "isolation runs" that involve nutrient loadings from only one source category at a time, as opposed to conducting runs with all loading sources active and "turning off" only one source category.

### 2. Scenario II: Isolation Run for Sediments

All other loading sources set at ZERO including upstream boundary (Lake Okeechobee), downstream boundary (Gulf of Mexico), atmospheric wet plus dry deposition, point sources, tributaries and distributed runoff.

The purpose of this run would be to determine the magnitude of the influence of sediment nutrient reservoirs (internal sources) and the time frame required for these sediment initial conditions to "wash out" of the system. This is important because computed water quality responses over the 2003-2005 period of simulation are probably driven by some combination of external land-based and air deposited loads and legacy nutrients in the sediments. If internal nutrient loads from the sediments are significant over this relatively short simulation period, and not at dynamic equilibrium or in balance with external nutrient loads, then this would bias determination of the TMDL. Depending on the degree of imbalance and the time frame for sediment initial conditions to "wash out" of the system, it may be necessary to conduct management scenarios for a longer period of time than three years in order to achieve dynamic equilibrium. Any reductions in external nutrient loads that are required to meet the TMDL targets should be determined only under dynamic equilibrium conditions among external loads, internal loads and conditions in the overlying water column.

It should be noted that even if internal nutrient loading from the sediments is significant under current conditions, it does not follow that sediment remediation would be necessary to achieve the TMDL targets. At dynamic equilibrium, there would be no net nutrient loading from the sediments to the water column. The significance of

sediment nutrients is their influence on the response time of the estuary to changes in external nutrient loadings. That is, they would not preclude achievement of the TMDL targets but they could lengthen the time frame required for achievement in response to external nutrient load reductions.

### 3. Scenario III: Isolation Run for Downstream Boundary Conditions (Gulf of Mexico)

All other loading sources set at ZERO including the upstream boundary (Lake Okeechobee), atmospheric wet plus dry deposition, point sources, tributaries and distributed runoff. Sediment initial conditions should be the same as those in the base calibration.

The purpose of this run is to determine the influence of the Gulf of Mexico as the sole external loading source, and how far upstream into the lower estuary this influence might propagate. This is important because net nutrient loadings across the downstream boundary cannot be changed by management actions within the Caloosahatchee Watershed. It is also important because it may be learned that water quality conditions in the lower portion of the estuary are strongly influenced by the Gulf of Mexico and relatively insensitive to reductions in land-based nutrient loadings.

### 4. Scenario IV: Isolation Run for Atmospheric Wet Plus Dry Deposition

All other loading sources set at ZERO including the upstream boundary (Lake Okeechobee), the downstream boundary (Gulf of Mexico), point sources, tributaries and distributed runoff. Sediment initial conditions should be the same as those in the base calibration.

The purpose of this run is to determine the influence of atmospheric sources as the sole external loading source. This is important because most of the loadings from these sources probably do not originate in the Caloosahatchee Watershed and thus cannot be changed by management actions within the watershed itself, although they may be amenable to regulation by the State of Florida.

### 5. Scenario V: Isolation Run for Point Sources

All other loading sources set at ZERO including the upstream boundary (Lake Okeechobee), the downstream boundary (Gulf of Mexico), atmospheric wet plus dry deposition, tributaries and distributed runoff. Sediment initial conditions should be the same as those in the base calibration.

The purpose of this run is to determine the influence of point sources, the only source category that is regulated by NPDES permits.

## Key Questions

The undersigned members of the TMDL Technical Working Group, together with Dr. Bierman, have prepared a list of key questions related to the nutrient TMDLs for the Caloosahatchee River and its estuary.

1. What loading sources matter most? What N sources? What P sources?
2. What loading sources are controllable using proven BMPs and what sources are not easily controllable?
3. What sources originate within the Caloosahatchee Watershed and what sources originate outside the watershed?
4. Are reductions in loading sources within the Caloosahatchee Watershed sufficient to achieve the TMDL targets? If not, what reductions in loading sources are required outside the watershed?
5. Do loads from any individual source category by itself result in non-achievement of the TMDL targets?
6. What is the role of legacy nutrient reservoirs in the sediments of the Caloosahatchee River and Estuary?
7. Is three years (2003-2005) a sufficient amount of time for management scenario simulations, or is a “spin up” period necessary in order to ensure dynamic equilibrium among external watershed loadings, internal loadings from the sediments, and conditions in the overlying water column?

8. What about trade-offs between N and P? Can the TMDL targets be met by reductions in N alone, P alone, or by a combination of N and P reduction?

We expect the Department will ensure that these questions can be answered as you continue to develop the model and TMDL for the Caloosahatchee River.

### Need for Cumulative Frequency Distributions

Finally, as discussed at the last TMDL meeting, there needs to be cumulative frequency distributions as part of the calibration metrics, to see how well the model is fitting the data. At that meeting, Jan Mandrup-Poulsen indicated that FDEP "can add that". We appreciate FDEP and the consultants' efforts to do so, as we believe this is an essential component in ensuring that the model is adequately calibrated.

### Conclusion

In conclusion, we want to express our collective appreciation for your careful consideration of our comments and formally request that we receive a written response to this letter in order to allow us to know whether or not our concerns will be addressed going forward. Please feel free to contact any of us at the numbers below if there are any questions or if you would like to discuss further.

Sincerely,

Linda Young, Director
Clean Water Network of Florida
(850) 222-9188

Jennifer Hecker, Natural Resource Policy Manager
Conservancy of Southwest Florida
(239) 262-0304 x250

Rae Ann Wessel, Natural Resource Policy Director
SCCF-Sanibel Captiva Conservation Foundation
(239) 731-7559

Cc: Jan Mandrup-Poulsen
Bureau of Watershed Management
Twin Towers Office Building - Room 238
2600 Blair Stone Road, MS # 3555
Tallahassee, Florida 32399-2400

Chris Wallen (by email)
Steve Lienhart (by email)
Scott McClelland (by email)
Pat Fricano (by email)
Jennifer Nelson (by email)

Ms. Janet Starnes
Project Manager, Caloosahatchee River Watershed Protection Plan
Southwest Florida Water Management District
6301 McGregor Blvd.
Fort Myers, Florida 33901