November 1, 2013

Dr. Gretchen Ehlinger
U.S. Army Corps of Engineers
P.O. Box 4970
Jacksonville, FL 32232-0019

Dear Ms. Ehrlinger:

These are the formal public comments of Larry E. Fink, M.S., Owner and Principal, Waterwise Consulting ™, LLC, on the Project Implementation Report (PIR) dated August 2013 for the Tentatively Selected Plan (TSP) for the Central Everglades Project Plan (CEPP) public noticed by the U.S. Army Corps of Engineers (USACE)-Jacksonville with its Everglades restoration partner, the South Florida Water Management District (SFWMD) on September 9, 2013. (http://www.evergladesplan.org/pm/projects/project_docs/pdp_51_cepp/dpir/082813_cepp_dpir_main_report.pdf). In the context of the National Environmental Policy Act, the regulations, guidelines, policies, and procedures implementing NEPA, and the judicial precedents regarding the NEPA process, the TSP is also known as the Preferred Action (PA) and the preparation, public notice, taking of public and agency comment, revision, public notice of the revised final PIR must also meet all of the requirements of the NEPA process in the preparation, public notice, taking of public and agency comment, and the public notice of a revised final project-specific Environmental Impact Statement (EIS), Findings of No Significant Impacts (FONSI), and the Record of Decision (ROD) http://www.epa.gov/compliance/resources/policies/nepa/#policies-procedures,
including environmental justice considerations for minorities and the nations of the first peoples. http://www.epa.gov/compliance/nepa/nepaej/index.html. These comments supersede and replace those submitted on October 15, 2013.

Executive Summary

The predominantly drained soil conditions required for sugar cane farming in the Everglades Agricultural Area (EAA) result in the oxidation of roughly half an inch of peat soil each year. Nutrients and non-nutrient toxic substances and their precursors leach out of the oxidizing peat soil into stormwater runoff. Unlike nutrients, these non-nutrient toxic substances and precursors are not treated by the constructed wetlands known as Stormwater Treatment Areas (STAs) sufficiently to eliminate that toxicity, and there are no plans to add superior technologies for that purpose. These inadequately treated toxic substances and precursors are eventually discharged to the remnant impounded Everglades. This results in the presence of toxic substances in toxic amounts, which is precluded by the Federal Clean Water Act and equivalent Florida water law.

In its present configuration, the irreversible consumptive use of peat soil for sugar cane production in the EAA is incompatible with the restoration and protection of South Florida ecosystems in general and the Everglades in particular. Conversely, agricultural practices that require primarily flooded conditions, e.g., rice and aquaculture, are not incompatible with Everglades restoration. Such practices are also not incompatible with the emergency stacking of

emergency releases of water from Lake Okeechobee that would otherwise be routed to tide, where the polluted fresh water is destroying the east and west coast estuaries. Land purchased via eminent domain for purposes of stacking Lake Okeechobee emergency releases could also be leased for flood-compatible uses with deed restrictions that preclude the discharge of nutrients or toxic substances or their precursors at rates that exceed the capacities of the STAs to treat them to safe levels.

Unfortunately, the CEPP process did not identify this alternative as superior to the set of projects that emerged as the TSP/PA, because the CEPP process assumed as convenient expedients that the EAA would continue to be used primarily for sugar cane farming and that STAs would treat nutrients and non-nutrients, including and especially the light-limiting dissolved organic carbon (DOC) and the toxic substance precursor, sulfate, to safe levels, when that is not the case. These and related concerns were brought to attention of the South Florida Ecosystems Task Force in several workshops early in the CEPP process (Attachment 1 and 2), so this is no last-minute surprise. Instead, these legitimate water quality constraints were ignored in the decision-making process, despite the fact that the enabling legislation for CERP, of which CEPP is derivative, the Water Resources Development Act of 1996 and 2000, preclude the violation of any Federal law, regulation, or standard in reconfiguring the Central and Southern Florida (C&SF) Project system for purposes of South Florida ecosystem restoration. Most unfortunately, ignoring water quality constraints on the design, operation, and maintenance of CEPP projects has serious consequences that cannot be ignored by the taxpayers who must pay for this injustice and the people who are exposed to toxic substances toxic amounts in the fish they eat, especially the subsistence consumers and native peoples protected by the Environmental Justice provisions of NEPA created by Presidential Executive Order. This is also true of the fish-eating wildlife and their predators, some of which are listed as threatened or endangered species under the Federal Endangered Species Act and/or its Florida equivalent. Such species include the bald eagle, wood stork, Everglades mink, and Florida panther.

In summary, the TSP/PA and the project-specific PIR/EIS for the TSP/PA are critically deficient, because the process used to develop, screen, and select Everglades restoration project alternatives is administratively, legally, and technically fatally flawed.

(1) It is administratively fatally flawed, because the project-specific PIR/EIS should have been preceded by a revised Programmatic EIS (PEIS) for CERP that considers the broader implications of the changes in the approach to and environmental impacts of CERP as a result of CEPP, including changes to the assumptions, approximations, interpolations, and extrapolations upon which the environmental impact assessment in previous PEISs and project-specific PIRs/EISs were based.
(2) It is legally fatally flawed, because it is a violation of the following laws, regulations, standards, or practices:
(a) Clean Water Act (CWA), because it makes a Water Quality Standards compliance distinction between impacted and unimpacted areas in the same water body, thereby implicitly granting a permanent variance from WQS in already impacted areas, neither of which is provided for in the CWA.
(b) Endangered Species Act, because the excess methylmercury production, bioaccumulation, and risk caused by routing inadequately treated high-sulfate EAA

runoff to the Everglades represents a toxicological barrier to access and use by fish-eating wildlife and their predators, including the endangered wood stork, bald eagle, Everglades mink, and Florida panther, and, thus, constitutes an unlawful taking.
(c) creates an attractive nuisance, because it encourages growth and development in zones where the risk of loss of life, limb, and property is high a result of the rapidly failing Herbert Hoover Dike (HHD).

(3) It is technically fatally flawed, because:
(a) It omits critical selection criteria/performance measures, i.e., non-nutrient water quality constraints, light limitation and time-to-recovery.
(b) It omits viable alternatives to the TSP, i.e.., those that accelerate the time-to-recovery of nutrient-impacted areas by removing or stabilizing contaminated sediments or mechanical harvesting of rooted macrophytes growing in the contaminated sediments in Lake Okeechobee or the impacted Everglades.
(c) It omits known or reasonably anticipated significant adverse environmental impacts, including causing or contributing to:
(i) the presence of toxic substances in toxic amounts, e.g., hydrogen sulfide and methylmercury, caused by routing high-sulfate EAA runoff to the Everglades; and/or
(ii) the irretrievable commitment of resources, e.g., EAA peat soil oxidation, as a result of CEPP facilitating the continuation of the consumptive uses of water quantity and quality to grow EAA crops requiring predominantly drained conditions.
(d) It evaluates stage-duration-frequency contours using a water quantity model that is deficient in representation of resistance to flow and quantification of evapotranspiration, based on presentations made and papers published by the U.S. Geological Survey and the comments of various peer review panels, each of which are incorporated here by reference.
(e) It evaluates compliance with the phosphorus WQS using a water quality model that is deficient in representation, parameterization, calibration, and validation and that cannot model non-nutrient water quality compliance or impacts for non-conservative toxic substances, e.g., mercury.
(f) It did not include a rigorous quantitative uncertainty analysis regarding the probabilities of achieving and not achieving the water quantity, quality, routing, and timing criteria and the probabilities of causing or not causing various adverse impacts, including but not limited to excess methylmercury production, bioaccumulation, and risks to exposed humans and fish-eating threatened or endangered wildlife. The results of the qualitative and semi-quantitative approximations to a rigorous quantitative uncertainty analysis used by the modelers that were appended to the draft PIR/EIS are not sufficient in this regard.
(g) It did not include an adequate margin of safety in the engineering design and adequate operational flexibility sufficient to compensate for the propagated uncertainties in the quantity, quality, timing, and routing of water under routine, extreme weather, and various failure modes, including a catastrophic failure of the Herbert Hoover Dike.

As a consequence of these fatal administrative, legal, and technical flaws, individually and collectively, the work products deriving from this process, including the TSP/PA and the PIR/EIS for the TSP/PA, are themselves administratively, legally, and technically fatally flawed. To correct these serious errors of omission and commission and the consequences thereof, I

recommend issuing a revised PEIS for CERP and a revised project-specific PIR/EIS for a new TSP/PA using water quantity and quality models developed by or for USACE, USGS, and/or USEPA evaluating the benefits and detriments associated with a modification of Alternative 6 which proposes a breaching the Herbert Hoover Dike (HHD) surrounding Lake Okeechobee and a spillway/flow-way to spread and route that flow into the upper portions of Remnant Impounded Everglades. This will allow a more natural quantity, quality, timing, and routing of flow than the present TSP/PA, while reducing the flood risk from dike collapse and the damages to the Indian River Lagoon and Caloosahatchee River estuary from excessive freshwater releases required to relieve pressure on the dangerously failing HHD .

Introduction

Although perhaps 20% of the water flowing into the Everglades originates with Lake Okeechobee releases, 80% comes from stormwater runoff and groundwater recharge from the Everglades Agricultural Area (EAA). In South Florida evaporation and plant transpiration (evapotranspiration) are roughly equal to rainfall, so rainfall dilution is not a reliable solution to pollution. The nutrient-rich overflow from the pre-development Lake Okeechobee resulted in the deposit of a thick layer of peat over the exposed rock over thousands of years. When that peat soil dries out, it is slowly oxidized by the oxygen in the air to carbon dioxide. The oxidizing peat soil leaches dissolved organic carbon (DOC), which absorbs the wavelengths of sunlight required for plant photosynthesis. As a result, nutrient-limited plant growth can switch to light-limited plant growth for submersed aquatic vegetation (SAV) in a few feet of surface water contaminated with EAA leachate. Peat oxidation also releases the toxic substances precursors such as the most stable oxidized form of sulfur (S), sulfate. Peat soil oxidation also releases heavy metalloids and metals, including arsenic and inorganic mercury (IHg). Some of the IHg in EAA soil is inadvertently transformed by sulfate-reducing bacteria (SRB) in wet soils under conditions virtually devoid of oxygen (anaerobic) into a much more toxic and bioaccumulative form, methylmercury (MeHg). Other abiotic and biotic processes convert some of IHg into elemental mercury, which is a liquid at room temperature. The total mercury (THg) in EAA runoff, groundwater, and surface water consists primarily of IHg, MeHg, and elemental mercury (Hg(0). Most of the Hg(0) in soil and some of the Hg(0) in surface water is lost to the atmosphere via a process known as volatilization or evasion.

The sulfate in EAA runoff passes through the STAs virtually untreated into the Everglades, where it is converted into toxic hydrogen sulfide by SRB in anaerobic surficial sediments. The hydrogen sulfide can accumulate to toxic levels in the sediment pore water, but its concentrations in the overlying surface water are rapidly diminished by the process of oxidation in the presence of dissolved oxygen (DO). Nevertheless, the hydrogen sulfide concentrations in the surface water at the sediment/water interface often exceed the 2 micrograms per liter (ug/L) Water Quality Criterion (WQC) published by the U.S. Environmental Protection Agency (USEPA) in its Red Book to protect sensitive aquatic species the feed on or live in the surficial sediments. The set of narrative Water Quality Standards that each state must officially issue (promulgate) and enforce under the Federal Clean Water Act (CWA) precludes the presence of toxic substances in toxic amounts at any time in fishable and swimmable waters like the Everglades, irrespective of whether a numerical WQS has been promulgated for that substance. That also applies to the pesticides in EAA runoff.

The IHg and MeHg in EAA runoff are routed through the STAs, where about 50% to 75% of both are removed by various physical, chemical, and biological processes. Nevertheless, what remains represents an unnatural loading rate of IHg and MeHg to the upper portion of the remnant Everglades. These watershed-specific contribution to the IHg load were not taken into account in FDEP's statewide approach to mercury TMDL development and implementation (Attachment III), despite the fact that the Everglades has been officially listed under the Clean Water Act as mercury-impaired, because the fish are contaminated with levels of MeHg high enough to prompt a public health advisory for humans making recreational or subsistence use of the Everglades or the C&SF Canal system as a fishery. To this unnatural load is added the MeHg that is produced from the IHg in rainfall by the same SRB that convert sulfate to toxic hydrogen sulfide. The high levels of MeHg in mid- and top-predator fish also expose fish-eating wildlife to levels of MeHg sufficient to interfere with normal brain function (neurotoxicity) sufficient to interfere with other life functions, such as hunting for food, avoiding predators, and mating for reproduction. In many cases the MeHg that passes from mother to the embryo in the egg or uterus is at high enough concentrations to cause neurotoxic effects in the next generation and less frequently at levels that are lethal to the developing embryo or fetus.

CEPP is intended to accelerate the planning of key project elements of the Comprehensive Everglades Restoration Plan (CERP), which is authorized and constrained by the Water Resources Development Act (WRDA) of 1996 and 2000. Because CERP subsumes CEPP, by extension, these same constraints apply to CEPP without exception. The constraints include the general proscription against causing or contributing the violation of any applicable Federal law, regulation, or standard , which subsumes the explicit proscription against the violation of any duly promulgated narrative or numerical Water Quality Standard applicable to the Everglades, Biscayne Bay, or Florida Bay, any Total Maximum Daily Load (TMDL) based on that WQS, and any Water Quality-Based Effluent Limit based on that TMDL pursuant to Section 303 of the Federal Clean Water Act (CWA). In this context, the applicable WQS, TMDLs, and WQBELs include those promulgated, derived, and issued by the State of Florida and the sovereign nations of the first peoples living in or discharging to the Everglades, Biscayne Bay, or Florida Bay, including the Seminole Tribe of Florida and the Miccosukee Tribe of Indians of Florida.

The acceleration of CERP planning process for CEPP necessarily required the adoption of assumptions, approximation, interpolation, and extrapolations that necessarily increased the uncertainties associated with the likelihood of attaining and maintaining the target stage, flow, duration, and frequency specifications associated with the various physical, chemical, and biological performance measures adopted by the USACE-Jacksonville and SFWMD over the area to be restored and avoiding unacceptable adverse impacts within and downstream of the restored areas with the required magnitudes, durations, and frequencies at the required confidence levels for avoiding committing unacceptable Type I error, concluding that the project is not attaining performance objectives when it is or is causing significant downstream adverse impacts when it is not, and unacceptable Type II error, which is the opposite of Type I error. In such circumstances, it is standard professional practice for engineers to increase the margins of safety in project element designs, operating plans, and maintenance schedules under routine, extreme weather, and various failure modes to increase the likelihood of achieving the desired outcome and to decrease the likelihood of causing or contributing to adverse impacts, including

but not limited to the loss of life, limb, or property. This was not done. This also results in the systematic underestimate of the cost of the construction, operation, and maintenance of these project elements and the systematic underestimate of the unreasonable risks associated with the various alternatives, including that eventually recommended as the PA/TSP. The appropriate Florida licensing board should determine whether this constitutes a significant violation of professional standards of practice and ethics that puts the professional engineering licenses of those involved in jeopardy. Being ignorant of or having been ordered by a government agency or private entity to violate these professional norms is not a defense for professional irregularities or the consequences that flow therefrom.

Violations of the Clean Water Act: Nutrients

CEPP planners claim that they did evaluate the downstream water quality impacts of the various CEPP alternatives selected for detailed analysis based on the concentration of total phosphorus (TP) in the areas to be restored using some modified version of the Dynamic Model for STAs (DMSTA). However, I am unaware of any graphs or maps that displayed the magnitude, duration, and frequency of exceedance of the 10 ppb TP WQS at key compliance nodes over time, especially in areas in the upper portions of the impounded remnant Everglades already impacted by inadequately treated EAA runoff.

To circumvent this problem, with the complicity of FDEP and USEPA Region 4, SFWMD and USACE-Jacksonville make a distinction between the water quality of unimpacted areas, where the discharge cannot cause further impairment, and the impacted areas, where the discharge can be higher, because the area is already polluted. Unfortunately, the CWA makes no such distinction, and, where the historically contaminated sediment is contributing to the pollution of the overlying water, without a commitment to remediate that condition, the discharge of pollutants to that area must be lower, not higher, to allow the system to recover naturally by burying out the contamination with clean sediment or peat soil.

By allowing SFWMD and USACE-Jacksonville to adopt this unlawful subterfuge, FDEP, with the complicity of USEPA Region 4, has created an implicit permanent zone of variance from the TP WQS. Under the CWA, there is no provision for an implicit variance, and an explicit variance must be requested and granted for a period of no more than three years, after which it can be reissued only if the discharger has made a good faith effort to reduce the discharge and/or to remediate the sediments by dredging, stabilization, or harvesting of rooted macrophytes for bioremediation to prevent recycling of the contaminants. No CEPP alternative includes contaminated sediment remediation. That being the case, in areas where the contaminated sediment is causing the overlying water column to violate a WQS, the assimilative capacity of the receiving water has been exceeded, and the Water Quality Based-Effluent Limit is 0, which is enforced at the method detection limit of the USEPA-approved analytical method for that pollutant. The NPDES permits for the STAs by USEPA Region 4 do not take this into account.

Violations of the Clean Water Act: Non-Nutrients in the Form of Mercury

All of the Everglades and portions of Florida Bay are listed under the Clean Water Act as mercury-impaired, as a consequences of the public health advisories issued by the State of

Florida and the Everglades National Park, beginning in 1989 and 1995, respectively. While the majority of the planners, scientists, and engineers in the Federal, State, and Local government agencies were focusing on regulating the excess TP in EAA stormwater runoff, a consortium of government, academic, and private sector scientists organized as the South Florida Mercury Science Program were conducting monitoring, research, and modeling to understand and solve the Everglades and Florida Bay mercury problems.

In the period 1995-1999 recognized experts in the field determined that the methylmercury was being produced from inorganic mercury (IHg) primarily by sulfate-reducing bacteria (SRB) and primarily in the surficial sediments under anoxic conditions where dissolved oxygen is essentially absent but organic carbon is abundant. The addition of sulfate in excess of natural background levels stimulated inorganic mercury methylation up to a maximum, beyond which the sulfide produced as a byproduct of SRB metabolism inhibits methylation by a mechanism that has not been explained to scientific certitude. Solving the Everglades methylmercury problem by driving it into sulfide inhibition is not a viable option, however, because sulfide in its hydrogen sulfide form is toxic in its own right and the sulfur cycle interacts with the P cycle in ways that could decrease its storage and increase its release from the pre-ECP contaminated sediments.

Subsequent controlled field studies conducted in large open containers (mesocosms) were able to reproduce these conditions, while determining that almost all of the inorganic mercury that was available to SRB for methylation was coming from the atmosphere, primarily in rain. In one of the great achievements of applied science of this or any other age, these phenomena were then reproduced at the watershed scale by pulse-dosing the watershed and lake in the Experimental Lakes Region in Canada with those same stable mercury isotope tracers and monitoring the lake's methylmercury production and bioaccumulation in fish over time.

By the late 1990s SFMSP scientists had concluded that it was more likely than not that the unnatural concentrations of sulfate in EAA runoff were causing or contributing to the downstream Everglades mercury problem and that the engineered wetlands constructed to remove excess nutrients, what we know as Stormwater Treatment Areas (STAs), were not able to remove the excess sulfate. At the turn of the 21st Century the high-sulfate water from EAA stormwater runoff was rerouted out of WCA-3A and into the C&SF Project canal system to avoid violation of the TP WQS and to protect the habitat of the Cape Sable Seaside Sparrow, while still providing water to keep ENP hydrated. Subsequently, the methylmercury production and bioaccumulation "hot spot" moved from the bottom one-third of WCA-3A to the top of the ENP in an area supplied with water from the L-67A stub canal. Now correlation is not causation, but the results of dosing of the mesocosms located at the new "hot spot" with a combination of stable mercury isotopes, sulfate, and dissolved organic carbon suggest that the rerouting of the EAA runoff from WCA-3A to ENP caused the recovery of WCA-3A at the expense of the degradation of the ENP.

The rerouting of high sulfate water out of WCA-3A and into the northern portion of the ENP has caused or contributed to the rerouting of the MeHg hotspot in largemouth bass from the center of WCA-3A to the top of ENP. However, although it has been discussed in South Florida Environmental Reports

(http://www.sfwmd.gov/portal/page/portal/pg_grp_sfwmd_sfer/portlet_prevreport/2013_sfer/v1/chapters/v1_ch3b.pdf;http://www.sfwmd.gov/portal/page/portal/xweb%20about%20us/agency%20reports) and perhaps USEPA Region 4's REMAP reports (http://www.epa.gov/region4/sesd/reports/epa904r07001.html), neither the Corps nor SFWMD has officially recognized this phenomenon, and neither FDEP nor USEPA Region 4 has officially acknowledged that sulfate in excess of natural background levels is causing the unacceptable impacts on recreational and wildlife uses associated with the observed excess methylmercury (MeHg) production and bioaccumulation effects.

In contrast, to prevent a third, first-flush MeHg anomaly in STA-2 Cell 1 from becoming an endangered species disaster when it was scheduled to be reflooded in the summer of 2003, SFWMD officially invoked the influence of the sulfur cycle on the mercury cycle to justify a deviation from the standard start-up protocol. The permit-mandated protocol involves holding the flood water until the total mercury (THg) and MeHg concentrations in the interior are less than the inflow. Unfortunately, this maximizes the short-term bioaccumulation, exposure, and risks to fish-eating wildlife, while fostering long-term recycling from dying plants that absorbed the undiluted first-flush pulse, resulting in a reservoir effect that could perpetuate the problem for a decade or several. As a consequence, SFWMD petitioned FDEP for a temporary modification or variance that would allow SFWMD to operate STA-2 Cell 1 in flow-through mode during start-up until sulfide in sediment pore water built up to inhibitory levels, thereby putting the sulfide brake on excess MeHg production from the bioavailable inorganic mercury flux from the oxidized wet soil.

FDEP officially approved that petition with the review and approval of USEPA Region 4, so both agencies have gone on public record as recognizing the influence of the sulfur cycle on the mercury cycle and the substantial risks that sulfate-mediated first-flush MeHg anomalies present to wildlife, including and especially endangered fish-eating species and their predators. (http://www.law.miami.edu/library/everglades/reports/2002/01/Everglades_Cons_Report/Appendices/App4A-7.pdf). I was the sole author of the report supporting that petition. The start-up alternative was successful, as evidenced by the reduction in the peak MeHg concentrations in trophic level 2, 3, and 4 fish and the corresponding risks to fish-eating wildlife, including the bald eagle with a nest in Cell 1 (http://link.springer.com/article/10.1007%2Fs10661-006-0767-4#page-1; http://www.sfwmd.gov/portal/page/portal/pg_grp_sfwmd_sfer/portlet_prevreport/2006_sfer/volume1/appendices/v1_app_4-7.pdf; http://www.tandfonline.com/doi/abs/10.1080/10807030590925768#.Ulty7VBptZ0), despite the then world record peak MeHg concentration of 20 ng/L in surface water set by the third, first-flush MeHg anomaly in STA-2 Cell 1. Conversely, if STA-2 had not stabilized in response to sulfide inhibition, Cell 1 would have had to have been abandoned, setting Everglades restoration back by years and the taxpayers by tens of millions of dollars. Thus, sound policy and permit decision-making flowed from the comprehensive analysis, integration, and synthesis of the results of well-designed, carefully executed, and peer-reviewed mercury monitoring, research, and modeling studies (http://my.sfwmd.gov/portal/page/portal/pg_grp_sfwmd_sfer/portlet_prevreport/ecr2003/appendices/app2b-5.pdf), some of which were outlined in the Programmatic EIS issued by USACE-Jacksonville for the Everglades Construction Project (ECP)

((http://mwaldon.com/Loxahatchee/GrayLiterature/ECP-EIS-1996/)) and mandated by the Section 404 Dredge and Fill permit issued to SFWMD for construction and operation. These unacceptable risks extend to the downstream Everglades (http://www.ncbi.nlm.nih.gov/pubmed/18679795). The Florida Fish and Wildlife Conservation Commission is well-aware of the monitoring, research, and modeling that supports the findings, conclusions, and recommendations of unreasonable risk to fish-eating wildlife in general and endangered species and their predators in particular (http://research.myfwc.com/publications/publication_info.asp?id=57831). This is also true of the U.S. Fish and Wildlife Service, which has been monitoring THg as MeHg in Florida panther fur and blood with FDEP assistance since 1989 (http://www.panthersociety.org/mercury.html).

USACE-Jacksonville recognized these potential adverse mercury impacts in is Programmatic EIS for the Everglades Construction Project (ECP) it published as final in 1996 (http://mwaldon.com/Loxahatchee/GrayLiterature/ECP-EIS-1996/) and the need to conduct monitoring, research, and modeling of the mercury cycle in the constructed wetlands and the downstream impounded Everglades in the 404 Dredge and Fill permit it issued to the construction and operation of the STAs in 1997. As the Corps notes in its own summary of its authorities and responsibilities:
http://www.evergladesplan.org/facts_info/sywtkma_corps_faq.aspx

2. Does the Corps regulate water quality?

No. Congress granted that authority to other agencies. Under the Clean Water Act, the Environmental Protection Agency (EPA) and authorized state and tribal governments promulgate and enforce water quality standards. The Corps cannot issue an individual permit until the applicant obtains water quality certification from EPA or the appropriate state or tribal government and does not issue the permit until all water quality concerns raised by the EPA have been addressed.

Under the organization of the multi-agency, multi-entity South Florida Mercury Science Program, which began in the mid-1990s, world-class scientists have conducted well-designed, quality controlled, and peer-reviewed monitoring, research, and modeling studies within a mass balance framework to understand and solve the Everglades mercury problem. These studies and annual reports also fulfilled the permit compliance mandates in the Section 404 Dredge and Fill permit issued to SFWMD by USACE-Jacksonville for the Everglades Construction Project (ECP) and the Section 402 NPDES permits issued by USEPA Region 4 and Everglades Protection Act permits issued by FDEP for the Everglades Nutrient Removal Project and each of the STAs as they came on-line. The main chapter and supporting appendices in the Everglades Interim Report published by SFWMD in 1999 (http://my.sfwmd.gov/portal/page/portal/pg_grp_sfwmd_sfer/portlet_prevreport/interimrpt_98/chpt7.pdf) and every annual report thereafter (incorporate by reference all main chapters and supporting appendices 2000-2013:

http://www.sfwmd.gov/portal/page/portal/xweb%20about%20us/agency%20reports) has analyzed, integrated, and synthesized the results of those and other relevant studies conducted by, for, or in conjunction with SFWMD staff on the mercury and sulfur chemical species distributions, sources, biogeochemistries, bioaccumulation, and effects, including but not limited to the influence of the sulfur cycle on the mercury cycle.

At the turn of the 21st Century, the state-of-the-science of the influence of the Everglades sulfur cycle on the Everglades mercury cycle was compiled in a report in an appendix to the mercury chapter in the 2003 SFER prepared by SFWMD's Mercury Program Manager (http://my.sfwmd.gov/portal/page/portal/pg_grp_sfwmd_sfer/portlet_prevreport/ecr2003/appendices/app2b-5.pdf). At the beginning of the second decade of the 21st Century, the publication of a paper by the leading experts in the USGS, FDEP, USEPA and Smithsonian represents the state-of-the-science on the distribution, sources, biogeochemistry, effects, and management of sulfur in the Everglades (http://water.usgs.gov/nrp/proj.bib/Publications/2011/orem_gilmour_etal_2011.pdf). Their key findings, conclusions, and recommendations are consistent with what FDEP and SFWMD scientists have published in the annual South Florida Ecosystem Reports on mercury and sulfur in the Everglades over the last decade, the most recent credible manifestation of which is the 2013 report co-authored or edited by FDEP's Don Axelrad, Florida's Statewide Mercury Coordinator (http://www.sfwmd.gov/portal/page/portal/pg_grp_sfwmd_sfer/portlet_prevreport/2013_sfer/v1/chapters/v1_ch3b.pdf).

The analysis, integration, and synthesis of the results of sound empirical science based on well-designed, carefully conducted, and peer-reviewed monitoring, research, and modeling studies within a mass balance framework support the following key findings, conclusions, and recommendations:

- Based on sulfur isotope and mass budgets, excess sulfate in the Everglades originates primarily with the continuing use of sulfur and sulfate soil amendments in the EAA and the release of legacy sulfur from the oxidation of drained peat soils, not connate sea water from the breaching of the confining layers during the construction of the primary canal system or secondary canal networks for the C&SF Project.
- Excess sulfate in EAA runoff causes or contributes to the presence of toxic substances in toxic amounts in the Everglades in the form of excess hydrogen sulfide.
- Excess sulfate in EAA runoff causes or contributes to a disruption of other natural cycles in the Evergaldes, including the carbon and phosphorus cycles.
- Excess sulfate in EAA runoff exerts a deterministic influence on the mercury cycle in the Everglades, stimulating excess methylmercury production up to a maximum, beyond which excess sulfide inhibits methylmercury production.
- The risks to humans and fish-eating wildlife and their predators exposed to this excess methylmercury bioaccumulating in the Everglades food chain are in excess of safe levels in some locations.

Based on these key findings, conclusions, and recommendations, the increase in the excess MeHg production, bioaccumulation, exposures, and risks associated with the routing of

inadequately treated excess sulfate in EAA runoff into the downstream Everglades to rehydrate it, irrespective of how well-intentioned, is unlawful. The Everglades should not be rehydrated with EAA runoff unless and until it is treated to remove sulfate in excess of the Everglades Restoration Performance Objective of 1 mg/L, because to do so would cause or contribute to a violation of duly promulgated and enforceable antidegradation provision, the narrative and numerical Class III Water Quality Standards (WQS) and the Federal Court-ordered Total Maximum Daily Loads (TMDLs) developed to implement them under the Federal Clean Water Act. Because the rerouting of inadequately treated sulfate in EAA runoff into the Everglades causes or contributes to an unacceptable risk to threatened and endangered species and their predators in the downstream Everglades, Big Cypress National Preserve, Biscayne Bay, and Florida Bay, and is, therefore, an unlawful taking under the Federal Endangered Species Act and the Marine Mammal Protection Act. That being the case, the TSP/PA violates the prescriptions and proscriptions in WRDA 1996 and 2000, both of which preclude the violation of any Federal law, regulation, or standard in the process of restoring the Everglades.

Moreover, the PIR/EIS prepared to justify the TSP/PA over viable alternatives does not comply with NEPA. First, there is no provision in NEPA that allows a Federal agency to suspend the requirement for reasonable assurances that there will be no significant adverse environmental impacts or irretrievable commitment of resources from the TSP/PA. To conform to the requirements of NEPA, the PIR/EIS must identify and evaluate all foreseeable adverse environmental impacts associated with the TSP/PA explicitly. They include all the foreseeable adverse environmental impacts identified above associated with rehydrating the Everglades with inadequately treated EAA runoff. If, subsequent to the finalization of the revised PIR/EIS, FONSI, and ROD, the required permits for the TSP projects are issued by the responsible Federal, Florida, and local agencies without the required reasonable assurances based on a claim of net benefit to the Everglades, the permit application process must still make that explicit rather than implicit, as is now the case in the Draft PIR/EIS for the proposed TSP/PA for CEPP. Second, such an approach presupposes that resource managers can reverse the consequences of the adverse impacts of all of the foreseen problems, including the failure to remediate contaminated sediments in Lake Okeechobee and the impacted areas of the Everglades, retarding the recovery of both; the creation of a permanent zone of variance in the upper portion of the Everglades where inadequately treated EAA runoff will be discharged; and the presence of toxic substances in toxic amounts, use impairment, and unacceptable risks to humans and wildlife subsisting on methylmercury-contaminated Everglades fish, shellfish, reptiles, or birds.

Clearly, the process and approach adopted by USACE-Jacksonville and SFWMD to develop, select, and evaluate the environmental impacts of the TSP/PA and various viable alternatives has resulted in the selection of a TSP/PA that is unlawful. The TSP/PA is also dangerous, because it assumes that the Everglades can survive the damage that will be done by rehydrating it with inadequately treated EAA runoff and that any serious harm that arises is reversible. If not, by the time anybody can prove beyond reasonable doubt that the agencies did irreversible harm to the Everglades with this gambit, the officials who blundered in their resource restoration decision-making will be long retired. Just as clearly, the CEPP process and approach adopted by the agencies to expedite the selection of the TSP/PA ignores the history of environmental disasters, many of which were the result of the unintended consequences of otherwise well-intentioned

actions, where haste made waste, and/or where sound science was trumped by sound politics. Thus, what they are proposing is also profoundly unwise.

Neither the USEPA Region 4 nor FDEP in its Federal or Florida review of and comment on this Draft PIR/EIS for the CEPP TSP/PA or its subsequent water quality certifications for the proposed CEPP projects can suddenly develop adverse environmental impact amnesia as regards the influence of the excess sulfate in EAA runoff on the downstream mercury cycle for purposes of preparing a scientifically accurate and legally defensible PEIS for CERP or CEPP, any project-specific PIR/EIS, or for purposes of establishing the required reasonable assurances needed to issue the various permits required for the various infrastructure elements of CERP or CEPP (http://www.saj.usace.army.mil/Portals/44/docs/regulatory/Items%20of%20Interest/Everglades%20A-1/Chapter%208%20-%20Permits%20and%20License.pdf). Just asserting that water quality will not be a problem for the TSP/PA or any of its viable alternatives in the draft project-specific PR/EIS for the TSP/PA does not make it so. If one wants to make a net benefits argument, that is, the benefits of rehydrating the Everglades with a polluted water supply outweigh the detriments, that assertion must be explicit, not implicit, and it cannot result in the irretrievable commitment of resources in the form of an irreversibly damaged Everglades if the agencies responsible for restoration guess wrong and the detriments outweigh the benefits.

These comments are intended to jog the institutional memories of all of the responsible agencies in these regards to avoid administrative and judicial challenges to CEPP and then CERP that could delay these projects for years, even if the benefit of complete build-out to the Everglades, Biscayne Bay and Florida Bay will not be felt in what remains of my lifetime, while the MeHg and hydrogen sulfide detriments of rerouting high-sulfate runoff and leachate water from the EAA into the Everglades to rehydrate it will be almost immediate.

L-8 Reservoir Project

One of the environmentally significant changes in Everglades restoration engineering design and operation that has occurred between the preparation of the PEISs for the Everglades Construction Project (ECP) and the EAA Reservoir Project then and the preparation of the PIR/EIS for CEPP now is that EAA stormwater runoff and Lake Okeechobee release load-leveling for the STAs was to be accomplished by one large, deep, above-ground reservoir that dries out and rewets infrequently but is now to be accomplished by three, low-head, above-ground reservoirs that dry out and rewet frequently. One of these three shallow reservoirs has subsequently been replaced by the L-8 Reservoir Project (L8RP), a ~1,000-acre, ~40-ft deep, below-ground reservoir created by repurposing a series of limestone quarry pits that would otherwise have been abandoned and allowed to fill as an artificial lake by the owner, Palm Beach Aggregates (PBA).

As a consequence of breaching the confining layer during mining, the water quality of the water in the L8RP is substantially and inherently different than the water quality in EAA stormwater runoff and Lake Okeechobee releases, even after being flushed out with EAA stormwater runoff and Lake Okeechobee releases. The most problematic of these differences is the irreducibly high levels of sulfate and its influence on the downstream Everglades sulfur and mercury cycles. However, these differences were ignored in making this substitution and in the draft PIR/EIS for

CEPP that incorporates this substitution. Even if the draft PIR/EIS is revised to acknowledge these differences, the water quality model that was used to model nutrient removal in the reservoirs, reservoir-assisted STAs, and the nutrient-impacted and nutrient-unimpacted areas downstream, DMSTA, cannot model the influence of excess sulfate on the downstream sulfur or mercury cycles.

The set of limestone quarry cells that comprise the approximately 40,000 acre-ft L8RP was originally purchased by SFWMD from PBA to store excess wet-season water from L-8 Basin runoff and Lake Okeechobee releases to meet dry season minimum flows and levels of the Northwest Fork of the Loxahatchee River, an Outstanding Florida Water, portions of which are protected as Wild and Scenic. It is also officially listed as mercury-impaired with USEPA Region 4 by the State of Florida under Section 303(d) of the Clean Water Act (http://iaspub.epa.gov/tmdl/attains_waterbody.control?p_list_id=FL3226A&p_state=FL&p_cycle=2010). The various cells of this below-ground, man-made reservoir were left behind after the lawful mining of limestone under applicable county, state, and federal permits without any discharge to surface waters.

During and after mining, the 40-ft deep cells filled with a combination of net rainfall, water used and produced in the mining process, and seepage of connate water through the unconfined, high permittivity layer beneath the confining limestone layer that was breached toward the end of the active mining period. Concerns about the effect of this seepage on the viability of the L8RP as a storage reservoir prompted SFWMD to include the requirement that PBA conduct a water budget study to demonstrate that the seepage rate was acceptable prior to final transfer of the property to complete the sale. In the weeks preceding the test, which began on February 9, 2009, the L8RP was drawn down about 10 feet by a temporary pump, rather than the 20 feet specified in the purchase agreement, because that is all the temporary pump could deliver. The test was completed three weeks later at the end of February, and the test demonstrated to SFWMD satisfaction that the seepage rate was within contract specifications, even after the estimate was doubled to approximate the effect of a 20-ft draw-down. However, according to the relevant stage and flow data in DBHYDRO (http://www.sfwmd.gov/portal/page/portal/xweb%20environmental%20monitoring/dbhydro%20application), no pumping in or out of the L8RP occurred until June 2009, so the increase in stage, less rainfall plus ET, is the seepage rate during that 119 day period. From February 9, 2009, to May 31, 2009, there was 13.7 inches of rainfall recorded at S-5A, an average of 0.24 inches per day of pan evaporation, while the stage increased from -0.13 ft NGVD to 9.83 ft NGVD on May 31, 2009. Assuming ET averaged 85% of pan evaporation during that period, the seepage rate of about 0.087 feet per day at a 10’ drawdown, and likely exponentially higher as the overlying head is reduced, because seepage is likely to be coming predominantly from the bottom of the quarry pits, not the sides, which PBA stipulated had a very low transmissivity. The results of unpublished studies by SFWMD staff conducted in the winter, spring, and summer of 2011 support this inference. The new, full-size pump will no doubt be able to move the L-8 Canal water contaminated with EAA runoff in and out of the L8RP much more rapidly than the temporary pump used in the seepage study.

The seepage contribution from surficial and deep aquifer sources was also evaluated for the Everglades Nutrient Removal Project by Judson Harvey and co-workers at the USGS-Reston

(http://sofia.usgs.gov/publications/papers/quantgwdisnrech/methodology.html). The ENR Project is across Southern Boulevard from the L8RP. In addition to water budget studies, Dr. Harvey was able to infer the relative contributions of shallow and deep aquifers from the ratios of isotope tracers in the water. This was not done for the L8RP. One of Dr. Harvey's USGS-Reston colleagues from the South Florida Mercury Science Program, William Orem, Ph.D., used the ratio of del shifts in sulfur isotopes in groundwater and surface water to demonstrate that sulfur from EAA soil amendments, and not connate water seepage, was the predominant source of excess sulfate to the Everglades (http://water.usgs.gov/nrp/jharvey/pdf/jenvironqual.pdf). This was also not done for the L8RP.

This combination of net rainfall, mining process wastewater, and mining-related groundwater seepage has resulted in average concentrations of chloride and sulfate well above the levels present in surface waters receiving EAA stormwater runoff and Lake Okeechobee releases. Despite the presence of untreated mining process wastewater, the Florida Department of Environmental Protection (FDEP) issued a CERPRA permit in March 2007 for the discharge of untreated wastewater from this industrial category to the L-8 Canal, a Class III water, but not the required NPDES permit under Section 402(b) of the CWA. When the chloride concentrations exceeded the Florida numerical WQS for Class III surface waters, FDEP granted a mixing zone to SFWMD for two years that was extended for another two and is now a permanent feature of the five-year CERPRA permit reissued in January 2012. The permit-mandated downstream monitoring of largemouth bass in the Grassy Waters Preserve (GWP) for total mercury (THg) as methylmercury (MeHg) in edible flesh detected concentrations frequently in excess of USEPA's WQC of 0.3 ppm in fish flesh and occasionally in excess of Florida's action level of 0.5 ppm THg. Nonetheless, FDEP ignored the potential for excess sulfate in the L8RP discharge to exacerbate the mercury impairment of downstream fishable uses and subsequently allowed the permittee, SFWMD, to reduce the frequency of downstream fish mercury monitoring in GWP rather than increase the frequency to detect statistically significant trends.

So problematic was the water quality in the L8RP that USACE-Jacksonville refused to authorize the reimbursement of its cost to SFWMD under CERP as one of the approved Northern Everglades Restoration Projects. Subsequently, to issue NPDES permits for the STAs that would conform to the Judge Gold's Final Judgment, the proposed use of the L8RP was repurposed from storing excess wet-season stormwater runoff and lake releases for dry-season rehydration of the NWFLR to storing those same waters for load-leveling and subsequent routing through the STAs for removal of nutrients prior to discharge of the Everglades. An approximately $60M pump station was approved by SFWMD's GB for the latter purpose in the summer of 2013. The rehydration of the NWFLR is now to be effected by a new reservoir constructed on partially developed Mecca Farms land. The runoff water used to fill the Mecca Farms reservoir is unlikely to contain the same high levels of sulfate present in connate sea water and EAA runoff, because the canals are generally shallower than those in the central Everglades and because the agricultural lands in the watershed do not control soil pH using sulfur as a soil amendment or oxidize nearly as fast as the rates occurring in the EAA.

Ultimately, only modeling of the sulfate quality of the water under various operational scenarios will be able to quantify the range of sulfate concentrations and loads that will be delivered from the L8RP to the STAs in the eastern flow-way over the CEPP design horizon. Only a mercury

cycling model coupled with a toxicological risk model will be able to translate the excess sulfate into excess risks of methylmercury exposure to humans and wildlife subsisting on fish, shellfish, amphibians, reptiles, and/or birds in the Everglades over that same period. This includes members of the Miccosukee Tribe of Indians who wish to live in a traditional manner in the Everglades. The required modeling for CEPP environmental impact assessment has not been done by or for SFWMD and USACE-Jacksonville in the evaluation of the environmental impacts of the TSP/PA and the viable alternatives associated with routing inadequately treated high-sulfate water from whatever source into the Everglades.

The CERPRA permit-mandated annual water quality compliance report for the L8RP is contained in Appendix 2-2 of SFER 2013: http://www.sfwmd.gov/portal/page/portal/pg_grp_sfwmd_sfer/portlet_prevreport/2013_sfer/v3/appendices/v3_app2-2.pdf. The monitoring results reported by SFWMD staff to FDEP demonstrate a persistent sulfate problem in the L8RP, with the monitored outflow averaging 132.3 mg/L roughly twice the monitored inflow averaging 65.7 mg/L. The outflow average has slowly declined over time, however, suggesting that the unlawful flushing of untreated mining-related process wastewater and seepage diluted with L-8 Canal water back into the L-8 Canal without an NPDES permit is slowly asymptotic to a new steady state sulfate concentration, albeit one still substantially in excess of the average inflow concentration and even more so the RECOVER performance objective of < 1 mg/L. This excess sulfate will then be routed through the STAs virtually untreated into the northern Everglades, where it will cause or contribute to the excess MeHg production, bioaccumulation, exposure, and risks (Fink^3), contrary to the CWA and equivalent Florida water law, as well as WRDA 1996 and 2000. Therefore, the use of the L8RP as a load-leveling reservoir to improve the nutrient removal efficiencies of the STAs is contrary to sound science and engineering concepts, principles, and practices, as well as being unlawful, and unwise.

If it is determined that the breached area is so extensive that it is impractical to reisolate the limestone quarry pits from the unnatural connate seawater flux with a synthetic barrier, then the water quality of these repurposed limestone quarry pits has been irretrievably compromised. If that is the case, FDEP should formally rescind their designation as waters of the state and restore them to the status of abandoned limestone quarry pits, again isolate them from the waters of the state, and only permit them to be used as a water supply for closed system use, e.g., cooling water for the adjacent gas-fired power plant with subsequent deep-well injection of the spent cooling water. If, instead, they are to be used for flood control and water supply, the waters stored therein should only be used to flush out water bodies naturally high in sulfate, e.g., the Lake Worth Lagoon, not the NWFLR or the Everglades. Apparently, USACE-Jacksonville reached the same conclusion as regards the L8RP serving as a water supply for the rehydration of the NWFLR, but not yet for the Everglades.

With or without reservoir assistance, the STAs are not designed to remove sulfate, do not remove sulfate in the mg/L concentration range when operated as designed, as evidenced by more than ten years of inflow and outflow monitoring data, and no minor or major modification of the design or operation will make it possible to remove sulfate in that concentration range. That means that the routing of high-sulfate water from whatever source in excess of the RECOVER performance objective of < 1 mg/L through the STAs and thence to the Everglades is inherently

incompatible with Everglades restoration, because it will cause or contribute to the presence of toxic substances in toxic amounts, e.g., hydrogen sulfide, and/or the exacerbation of the Everglades mercury problem. The sources of excess sulfate in the proposed TSP include sulfate released in oxidizing EAA peat soil, the L8RP, and those canal segments where the confining layer was breached during construction and the flux of connate sea water is substantial. The PIR/EIS for the TSP did not give adequate consideration to the nature, extent, magnitude, duration, and frequency of violations of the general narrative prohibition against the presence of toxic substances in toxic amounts due to the presence of excess hydrogen sulfide or the impairment of the use of the Everglades as a sport fishery or the unacceptable risk of reproductive failure of threatened or endangered fish-eating wildlife species or their predators due to the presence of excess methylmercury to which excess sulfate will contribute.

Therefore, the proposed TSP for CEPP, which makes use of the L8RP, EAA runoff, and the canals of the C&SF Project canals, is inherently incompatible with Everglades restoration. However, if the no toxic substances in toxic amounts and no impairment water quality constraints must be relaxed on the basis of net benefit, a modification of Plan 6, the spillway/flow-way alternative, provides a greater net benefit to the Everglades than the TSP. This is because the breach of the Herbert Hoover Dike at the southern tip of Lake Okeechobee will deliver water to the Everglades of a more natural quantity, quality, routing, and timing than the proposed TSP for CEPP. This alternative will also reduce the reversible and irreversible damages being done to the estuaries from the emergency releases of excess water from Lake Okeechobee, as well as the risk of the loss of life, limb, and property from the catastrophic failure HHD during a 100-year storm when Lake Okeechobee is at the 100-year stage. The PIR/EIS for the CEPP TSP need to be revised to reflect these considerations, ramifications, and implications.

In support of the preceding, please also incorporate by reference the relevant and applicable hardcopy and softcopy records in the files and databases under the immediate control of, centralized files and databases accessible to, and archived files and databases that have been archived and that can be recalled by Ashie Akpoji, Larry Fink, Guy Germain, Boyd Gunsalus, Nirmala Jeyakumar, Beth Kackvinsky, Melissa Meeker, Matthew Morrison, Davies Mtundu, Laura Reilly, David Swift, Robert Verrastro, Michael Voich, and John Zahina and any private contractors for which any of these individuals was the project manager.

Water Quality Modeling

CEPP planners claim that they did evaluate the downstream water quality impacts of the various CEPP alternatives selected for detailed analysis based on the concentration of total phosphorus (TP) in the areas to be restored. The default water quality model used for this purpose was the Dynamic Model for STAs (DMSTA) or some modification(s) thereof. Unfortunately, DMSTA is incapable of modeling any pollutant other than total phosphorus (TP) and has not been peer-reviewed and validated even for that limited purpose. A more detailed list of the capabilities and limitations of DMSTA are summarized in a report from an independent contractor to SFWMD in Attachment IV.

Prior to approval of the EAA Reservoir Project construction and operation permits, the USACE-Jacksonville conducted an extremely limited assessment of the water quality impacts of the alternatives plan formulations and evaluation for the then proposed EAA Reservoir Project, including a side-by-side comparison of the results of the Eutromod and Vollendweider nutrient water quality models with the COE Walker reservoir model, none of which could model dissolved oxygen, sulfate, or mercury, despite these parameters having been identified as of concern for the design and operation of the EAA Reservoir Project, and despite the fact that there were a number of off-the-shelf water quality models, including USEPA's WASP 6, that could simultaneously model TP, TN, chlorophyll-a, DO, and methymercury production and bioaccumulation for input into human health and wildlife risk assessment modules. The link to that report is:
http://wetlandsolutionsinc.com/files/paper_reports/EAA_Water_Quality_Assessment_Report_Prelim_Draft.pdf

A 11/14/04 presentation by Robert L. Knight, Ph.D., to SFWMD evaluated the process of plan development and evaluation as regards water quality for the EAA Reservoir Project in general and the performance of DMSTA in particular. Among his recommendations was the need for a dynamic water quality modeling capability for all water quality constituents of concern beyond the capability of DMSTA, then and now.

DMSTA has severe limitations that preclude its use for application to downstream CERP and CEPP water quality impacts. DMSTA cannot distinguish between soluble, particulate, and colloidal P, omits critical processes for P cycling, including the effect of turbidity and color on the transmission of photosynthetically active radiation (PAR) in sunlight as a function of water depth governed by the Beer-Lambert Law, which is critical when evaluating the effect on water quality of storing and treating highly colored EAA runoff at various depths, and the recycling of P from sediments back to the water column by various physical, chemical, and biologuical processes, including particle resuspension, redox-sensitive desorption, and the release of P mined from the root zone from senescing leaves. Instead, these processes are lumped together in a net, long-term average TP setting rate. This long-term average TP settling rate obtained via calibration are then used to calculate dynamic aquatic ecosystem responses on a daily basis. This is both physically unrealistic and contrary to sound modeling practices. This is especially problematic when one is concerned about accurately representing the physics, chemistry, and biology of extreme events far from long-term average conditions that occur only infrequently but can have a cumulative adverse impact on downstream water quality that persists long after the pulse has passed. None of these limitations would have gone unnoticed in a rigorous peer review of the model structure and performance, including the results of a model validation.

As to the importance of using peer-reviewed models in evaluating the water quality impacts of CERP and CEPP, I quote from Page 160 of 267 of the NAS CROGEE Biennial Report on Everglades Restoration
(http://www.nap.edu/openbook.php?record_id=13422&page=9):

"ELM appears to be the only water quality model that has been approved for use by the USACE and that is actually used in CERP project planning (although not widely so). However, it is not listed among the modeling tools for use in the Central Everglades Planning Project

(USACE and SFWMD, 2012). Other water quality models that seem essential to an ongoing Central Everglades Planning Project, such as the Dynamic Model for Stormwater Treatment areas (DMSTA), have not undergone a formal, external peer review. External peer review is important, particularly for models that are used extensively in the planning process, and peer review of the DMSTA is a high priority."

This did not occur prior to, during, or following the use of various versions of DMSTA as the default water quality model for evaluating the water quality impacts of the various CEPP alternatives. Nor was DMSTA demonstrated to be valid for this application by comparing the post-calibration predictions to actual TP data collected along various flow paths in the Remnant Impounded Everglades for a sufficient period of time to encompass a typical range of normal and extreme conditions. That being the case, DMSTA cannot be used to discriminate between alternatives regarding the likelihood of exceeding the magnitude, duration, and frequency of exceedance of the TP WQS in the downstream Everglades, let alone the WQS of other non-conservative water quality constituents of concern, including and especially the production, bioaccumulation and risks from methylmercury. This is especially disconcerting because FDEP and SFWMD partnered to develop a wetlands version of the Dynamic Mercury Cycling Model (DMCM) that had been developed by TetraTech under contract to the Electric Power Research Institute for application to lakes. The Everglades Mercury Cycling Model version I was applied to the well-studied Water Conservation Area -2A (WCA-3A) in the impounded Everglades (http://my.sfwmd.gov/portal/page/portal/pg_grp_sfwmd_sfer/portlet_prevreport/consolidated_01/chapter%2007/chapter%207%20appendices/a07-03.pdf) and version II, which added bottom-up bioenergetics,, cells-in-series, and probabilistic analysis capabilities, was applied to the ENR Project, STA-2 Cell 1, and the flow path along the nutrient gradient in WCA-2A.

Therefore, no weight can be placed on the results of the evaluation of water quality impacts associated with each alternative using DMSTA even just for TP, so the draft PIR/EIS must be considered fatally flawed in this regard. These fatal flaws must be corrected by redoing the water quality modeling for evaluating CEPP alternatives using a general water quality model developed by of for USACE, USGS, or USEPA, augmented by a mercury cycling module. The most recent version of USEPA's WASP model includes a mercury module. In the alternative, the Version II of the Everglades Mercury Cycling Model (EMCM-II) can be run with the general water quality model as input. EMCM-II was developed by TetraTech, Inc., under contract to FDEP, co-managed by Don Axelrad of FDEP and Larry Fink of SFWMD. So SFWMD is well-aware both of its existence and its capabilities.

Findings, Conclusions, and Recommendations

- The CEPP process used to develop, evaluate and select the TSP/PA is administratively, legally, and technically fatally flawed.
- The water quantity and quality modeling tools used to implement the CEPP process cannot be demonstrated to be accurate and precise with levels of confidence sufficient to discriminate reliably between alternatives in a quantitatively rigorous way. The qualitative and semi-quantitative assertions that the CEPP can reliably discriminate between alternatives despite the propagated uncertainties in the assumptions, approximations, interpolations, and extrapolations are unconvincing in this regard.

- The water quality modeling tool used is only applicable to non-nutriuents, so the decision-making process was oblivious to adverse environmental impacts from toxic substances in toxic amounts, including but not limited the extremely toxic and bioaccumulative methylmercury (MeHg).
- As a consequence, the work products that were produced by that fatally flawed process, using these deficient modeling tools, including the TSP/PA, are also fatally flawed.
- A revised Programmatic Environmental Impact Statement (PEIS) is required for this precedent-setting administrative action, because the previous applicable PEISs incorrectly assume that the water supply for rehydrating the Everglades, Biscayne Bay, and Florida Bay will comply with all applicable nutrient and non-nutrient WQS, which is not now the case, but the project-specific PIR does not meet the requirements of a revised PEIS.
- The revised PEIS would have evaluated the legal and policy implications and ramifications of the precedent-setting environmental restoration programmatic approach that involves improving the quantity, timing, and routing of flow of an outstanding water resource at the expense of degrading water quality by using a contaminated water supply.
- The legal ramifications include causing or contributing to the violation of the National Environmental Policy Act, the Clean Water Act, the Federal Endangered Species Act, and the Marine Mammals Protection Act and to the violation of the Environmental Justice Executive Order by placing minorities and tribal members at disproportionate risks.
- An evaluation of the policy implications of this precedent-setting approach would have found that the process results in a systematic violation of Water Quality Standards, Total Maximum Daily Loads based on attaining and maintaining WQS at appropriate compliance points in the receiving waters, and the creation of implicit variance zones for nutrient pollutants, including but not limited to phosphorus, and non-nutrient pollutants, including but not limited to methylmercury (MeHg) and hydrogen sulfide.
- By ignoring these water quality constraints, projects that facilitated the continued use of the EAA for growing crops under drained conditions cause or contribute to the irretrievable commitment of resources in the form of irreplaceable peat soil that will be unavailable for future generations of farmers to use.
- Farming practices that result in peat oxidation and the release of non-nutrient toxic substances or their precursors that cannot be treated to safe levels by the STAs are incompatible with South Florida ecosystem restoration.
- Viable alternatives missed as a result of releasing CEPP from its water quality constraints include buying up the remaining privately owned lands in the EAA under eminent domain for emergency flood water storage with a lease agreement that requires farming practices that are compatible with flooded conditions, e.g., rice and aquaculture, and whose discharges are compatible with Everglades restoration, because the contaminants can be treated to safe levels by the existing STAs without superior technology augmentation.
- A spillway/flow-way emergency and routine Lake Okeechobee releases with spreader canals is compatible with Everglades restoration, and because Lake Okeechobee water is less polluted than EAA runoff, it is less water quality-constrained for the pollutants that the STAs cannot treat than is the TSP/PA.

Decades of overfilling of Lake Okeechobee and under-maintaining of the Herbert Hoover Dike (HHD) surrounding it have combined to undermine the HHD to the point that it is now an imminent threat to human life, limb, and property for those living in the flood zones from an uncontrolled catastrophic failure under the combined influence of a high stage and a major storm. This is a plea for the immediate reallocation of U.S. Army Corps of Engineers staff, physical, and fiscal resources from the routine and emergency maintenance, repair, and reinforcement of Lake Okeechobee's HHD to the construction of an emergency release outlet/relief valve to provide a controlled alternative to uncontrolled catastrophic failure of the HHD and the required downstream infrastructure to manage those emergency releases. This new infrastructure includes a spillway/flow-way, levees, diversion canals, and dikes to impound the emergency releases of flood water to be able to prevent a catastrophic uncontrolled failure of the HHD absent that capability. When the spillway is not being operated for the flood water management of Lake Okeechobee emergency releases, it can be operated to convey routine releases from Lake Okeechobee down the spillway/flow-way into the upper portion of the Remnant Impounded Everglades, also known as the Everglades Protection Area. This is a minor modification of the Plan 6 alternative to the TSP.

The modified Plan 6 alternative to the TSP creates a flow-way to carry water directly from Lake Okeechobee to the upper portion of the Remnant Impounded Everglades. Plan 6 also substantially increases the flow into the Remnant Impounded Everglades, but only via bypassing the R-STA system. However, some or all of the nutrient removal provided by the R-STA system could be achieved by spreading the flow over a wider area and allowing it to sheet-flow more slowly through appropriate types and densities of wetlands vegetation before reaching the upper portion of the Remnant Impounded Everglades. Unfortunately, the higher the rate of release, the shorter the contact time, and the higher the concentrations and loads of nutrients that will reach the Everglades, potentially violating the 10 ppb TP WQS promulgated by the State of Florida under the Clean Water Act. In contrast, the wastewater discharge permits already issued for the reservoir-assisted STAs by USEPA Region 4 allow a systematic violation of the TP WQS, effectively creating an implicit variance from the TP WQS at least for the five years the permits are in effect, while the Clean Water Act (CWA) only allows an explicit variance that must expire in three years. For non-nutrient contaminants, e.g., sulfate, arsenic, mercury, and various pesticides, dilution is the solution to pollution, CWA, WRDA 1996 and 2000 prescription and proscriptions to the contrary notwithstanding.

The modified Plan 6 emergency relief valve/outlet and spillway/flow-way alternative to the CEPP TSP is not perfect, but it will prevent the unnecessary loss of life, limb, and property of people living in the shadow of the rapidly failing HHD, which is one major storm away from catastrophic failure. It will also reduce the magnitudes, durations, and frequencies of emergency releases of Lake Okeechobee flood waters to both estuaries, diminishing the danger to threatened and endangered species, marine mammals, and their habitats, as well as decreasing the damage to the recreational, commercial, and aesthetic uses of and services provided by the estuaries and the economic values assigned to both. Waterwise Consulting, LLC, commends the modified Plan 6 alternative (Attachment V) to the attention of USACE-Jacksonville and its local sponsor, SFWMD.

Attachment I: (A) Letter of Larry E. Fink, M.S., Waterwise Consulting to Shannon Estenoz and (B) Her Reply and (C) Larry E. Fink's Response regarding the water quality constraints imposed on the selection of the TSP/PA as a result of the deterministic influence of excess sulfate in EAA runoff on the Everglades sulfur and mercury cycles.
Attachment II: E-Mails to and From Walter Wilcox identifying deficiencies in the water quality models in general and mercury modeling in particular.
Attachment III: Formal Public Comments Submitted to FDEP on the Draft Statewide Mercury TMDL Report, including but not limited to the need for waterbody-specific mercury TMDL for the Everglades and Florida Bay that take into account the influence of the sulfur cycle on the mercury cycle.
Attachment IV: Evaluation of Water Quality Model and Modeling for Plan Development and Alternatives Evaluation
Attachment V: Modified Alternative 6

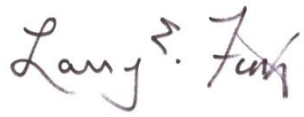
To support these written public comments, please also incorporate by reference the following into these written public comments:

- All of the meteorological, hydrological, and water quality data in the DBHYDRO.
- All interim and final water quantity and quality model runs to support the design and evaluation of CEPP alternatives and the preparation of the draft project-specific PIR/EIS for the TSP.
- Every reference in the main report and appendices of the draft project-specific PIR/EIS for the TSP/PA.
- The Everglades Interim Report 1999 and all subsequent South Florida Environmental Reports published through 2013.
- All formal peer review comments on any aspect the CEPP process and interim and final work products, including but not limited to the draft project-specific PIR/EIS for the TSP.
- All Federal, Florida, and local agency review comments, informal and formal, internal and external, unofficial and official, unpublished and published, interim and final, on any aspect the CEPP process and interim and final work products, including but not limited to the draft project-specific PIR/EIS for the TSP.
- All of the interim and final questions and comments submitted and presentations made by Larry E. Fink, M.S., Owner and Principal, Waterwise Consulting, LLC, on any aspect of the CEPP process or its interim or final work products.
- All formal responses prepared by or for SFWMD staff to any of the questions or comments submitted by Larry E. Fink, M.S., Owner and Principal, Waterwise Consulting, LLC, on any aspect of the CEPP process or its interim or final work products (a) published on the South Florida Ecosystem Task Force (SFERTF) website; and (b) prepared but never published on the SFERTF website.
- All internal public records created by or for SFWMD staff discussing or commenting on any of the questions or comments submitted by Larry E. Fink, M.S., Owner and Principal, Waterwise Consulting, LLC, on any aspect of the CEPP process or its interim or final work products.
- All public records produced by SFWMD in response to a public records request regarding the selection of DMSTA as the default water quality model for

evaluating the downstream water quality impacts of the various combinations of infrastructure design and operating alternatives for CEPP.

Thank you for this opportunity to comment on the Draft PIR/EIS for the TSP/PA for CEPP.

Sincerely,



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Attachment I: (A) Letter of Larry E. Fink, M.S., Waterwise Consulting to Shannon Estenoz and (B) Her Reply
Attachment II: E-Mails to and From Walter Wilcox
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