

**UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF FLORIDA
WEST PALM BEACH DIVISION**

CASE NO. 08-CV-80553-MIDDLEBROOKS/JOHNSON

**PALM BEACH COUNTY
ENVIRONMENTAL COALITION; PETER
“PANAGIOTI” TSOLKAS; PETER SHULTZ;
SHARON WAITE; and ALEXANDRIA LARSON**

Plaintiffs,

vs.

**THE STATE OF FLORIDA; PALM BEACH
COUNTY**, as a political subdivision of the
State of Florida; **CHARLES J. CRIST, JR.**,
as Governor, in his official capacity; the
**FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION**; and
MICHAEL W. SOLE, as Secretary, in his
official capacity; the **UNITED STATES
ARMY CORPS OF ENGINEERS; LT. GEN.
ROBERT L. VAN ANTWERP**, Commander
and Chief of Engineers, in his official
capacity; **GULFSTREAM NATURAL GAS
SYSTEMS, L.L.C.**, and **PALM BEACH
AGGREGATES, INC.**, a Florida corporation

Defendants.

AFFIDAVIT OF DR. SYDNEY BACCHUS

I, Sydney Bacchus, Ph. D., make this affidavit based on my personal knowledge, belief, and state the following:

A. EDUCATION, RESEARCH, AND PROFESSIONAL WORK EXPERIENCE

1. My name is Sydney Bacchus and I am a third-generation Floridian. I was a full-time Florida resident for approximately 40 years and a part-time Florida resident for approximately the past decade, while completing my doctoral degree. My business address is P. O. Box 174, Athens, Georgia 30603-0174.

2. **Advanced degrees** - I received a Bachelor of Science degree (1972) and a Master of Science degree (1977) from Florida State University (Department of Biological Sciences). My Masters research involved evaluating the changes in wetland and aquatic plant community composition in response to changing salinity regimes and changes in hydroperiod. Hydroperiod components include: a) the depth or stage of fluctuating ground and surface water; b) the duration of the water level at a given depth and stage; and c) the periodicity and seasonality of the water level fluctuations. My minor field of study was chemistry.

3. **Multidisciplinary doctoral program** - I completed graduate-level (predoctoral) courses in Hydrology, Hydrogeology, Geochemistry and Water Quality at the University of South Florida, then transferred to the University of Georgia (Athens) to complete more extensive graduate-level courses (e.g., Soil Physics, Geophysics, Forest Hydrology, Forest Pathology, Tree Physiology and various aspects of Ecology) for a multidisciplinary doctoral degree program in Hydroecology. Hydroecology is a multidisciplinary field that combines both physical and life sciences. It is the study of the interaction between living organisms and the water-related aspects (both quantity and quality) of their environment.

4. **Research focus** - The focus of my doctoral research was adverse environmental impacts (aka effects) associated with anthropogenic (man-induced) groundwater alterations. I received my Doctorate degree from the University of Georgia (Institute of Ecology) in 1999, after successfully defending my Dissertation titled, "New Approaches for Determining Sustainable Yield from the Regional Karst Aquifer of the Southeastern Coastal Plain." My research was conducted through representative subregions of the regional Floridan aquifer system. That regional aquifer system extends throughout the entire State of Florida and the coastal plains portions of Georgia, South Carolina and Alabama.

5. **Grants** - During my doctoral program, I received several grants from state agencies in Florida and federal agencies that supported my doctoral research. One of my grants from United States Geological Survey (USGS) supported geophysical research to evaluate the degree of connection between the Floridan aquifer and depressional wetlands throughout Florida and south Georgia. Other grants supported a controlled experiment, observing responses of native tree species to prolonged water stress and fungal pathogens. Those grants are listed in my Curriculum Vitae (CV) and incorporated into my affidavit. See Attachment A.

6. **Published literature** - I am familiar with the body of published literature relevant to my multidisciplinary area of expertise. Specifically, these include the fields of Hydrology, Hydrogeology, Submarine Groundwater Discharge, Geochemistry, Water Quality, Geophysics, Forest Hydrology, Forest Pathology, Tree Physiology and various aspects of Ecology, as they relate to Florida's wetlands,

other special aquatic sites and native wildlife habitat. I have authored or co-authored approximately 40 refereed (peer-reviewed) papers in those fields, specifically regarding groundwater/surfacewater interactions, karst aquifers, and flood plains/wetlands (aka special aquatic sites). My publications have been based on research I have conducted in wetlands (special aquatic sites) and other ecosystems, including marine, estuarine, and freshwater aquatic ecosystems throughout Florida. I also have served as a peer reviewer for manuscripts (related to the fields referenced above) that have been submitted to professional journals for publication. A list of my relevant peer-reviewed publications, awards and recognition of my work in the fields described above, as well as a description of my professional experience and affiliations with professional societies and other organizations, are provided in my CV (Attachment A).

B. PERSONAL KNOWLEDGE OF UNADDRESSED ADVERSE IMPACTS IN THE VICINITY OF CONSTRUCTED AND PROPOSED FLORIDA POWER & LIGHT (FPL) WEST COUNTY ENERGY CENTER (WCEC) PROJECT SEGMENTS AND SUPPORTING INFRASTRUCTURE

7. Segmentation and infrastructure supporting the proposed WCEC

Project expansion – Examples of constructed and proposed segments and infrastructure supporting the proposed Florida Power & Light (FPL) West County Energy Center (WCEC) Project expansion include, but are not limited to, the Barley Barber plant in western Martin County; the Barley Barber plant cooling pond; the Gulfstream natural gas pipeline currently being expanded from the Barley Barber plant to the proposed WCEC site; wells for the withdrawal of ground water and wells for injection of industrial and sewage effluent “wastewater.” The proposed WCEC Project expansion is located in western Palm Beach County.

8. Environmentally sensitive areas in the vicinity of constructed and proposed WCEC Project segments and supporting infrastructure –The proposed WCEC Project expansion site is located in the Everglades watershed (basin). The Everglades basin is the focus of a multi-billion dollar Everglades restoration effort funded by local, state and federal tax revenue. The proposed WCEC expansion site, also is known as the Corbett FPL site, is adjacent to the northern boundary of the Loxahatchee National Wildlife Area and less than ten miles from the J.W. Corbett Wildlife Management Area. Other environmentally sensitive areas within the vicinity of the project segments and supporting infrastructure of the proposed WCEC Project expansion include, but are not limited to the Dupuis Wildlife and Environmental Area, Lake Okeechobee and Loxahatchee Slough and River, including Grassy Waters Preserve. The proximity of these and other environmentally sensitive natural wetlands; flood plains; streams; coastal waters and the aquifer system in the vicinity of the proposed WCEC Project expansion and other segments and supporting infrastructure is shown in Attachment B. Attachment B is a copy of the 1:100,000-scale USGS 1985 map titled “West Palm Beach, Florida.” The locations of these environmentally sensitive areas are highlighted by orange dots on Attachment B. The location of the proposed WCEC Project expansion site is designated by the largest orange dot surrounded by blue and labeled “WCEC” on Attachment B. The straight-line distances from the proposed WCEC Project expansion site to the referenced environmentally sensitive areas are shown in black, with the distances labeled in miles.

9. Increasing extent and severity of impacts - I have conducted region-wide evaluations and research since the 1970s in environmentally sensitive ecosystems

(natural areas), such as wetlands, streams, flood plains, and associated forested upland habitats comparable to and including those in the vicinity of the proposed WCEC Project expansion, referenced above. In late July and early August 2008, I reconfirmed damage that has been occurring to the environmentally sensitive areas in the vicinity of the project segments, including supporting infrastructure segments associated with the proposed WCEC Project expansion. I also documented an increasing extent and severity of that environmental harm.

10. **Hydroperiod alterations and impacts not considered** - In my professional opinion, the recent and increasing severity of damage to the environmentally sensitive ecosystems in the vicinity of the proposed WCEC Project expansion is the result of hydroperiod alterations from adverse direct, indirect and cumulative impacts not considered by the U.S. Army Corps of Engineers (“Corps”) and other defendants in the above-styled case. Consideration of these impacts is required by the National Environmental Policy Act (“NEPA”), 42 U.S.C. §4321; the Endangered Species Act, (“ESA”), 16 U.S.C. 460; and Federal Clean Water Act (“CWA”), 33 U.S.C. §1344; in addition to other laws, rules and regulations.

11. **Cumulative impacts** - A synopsis of the 1997 Cumulative Effects Report prepared by the U.S. Council on Environmental Quality is incorporated into my affidavit as Attachment C. This synopsis provides examples of the types of cumulative impacts (effects) that the Corps defendants and other federal agencies are required to consider, but have failed to consider for this segmented project, including its supporting infrastructure. In my professional opinion, the failure to

consider cumulative impacts has resulted in increasing unpermitted adverse impacts and physical harm in the vicinity of the proposed WCEC Project expansion. It is my opinion that the segmenting of this large project led to the failure of defendants to consider the cumulative impacts of the entire project, including supporting infrastructure, in conjunction with impacts from other existing projects and future projects facilitated by this segmented expansion.

C. THREATS TO LOXAHATCHEE NATIONAL WILDLIFE REFUGE AND OTHER WETLANDS, FLOOD PLAINS, SPECIAL AQUATIC SITES AND WATERS DUE TO FAILURE TO CONSIDER ADVERSE DIRECT, INDIRECT AND CUMULATIVE IMPACTS

12. Wetlands, flood plains and other special aquatic sites and waters in

vicinity - A copy of two 1:24,000-scale historic USGS maps of the WCEC Project expansion vicinity, reduced to 8.5" x 11", are incorporated into my affidavit as Attachment D.

Attachment D-1 is the 1970 historic map titled, "Loxahatchee NW, FLA." Attachment D-2 is the 1971 historic map titled, "Loxahatchee, FLA." Attachment D-2 is the eastern extension of the Attachment D-1 map. The northern extent of the Loxahatchee National Wildlife Refuge (LNWR, Refuge) is located in the south-central area of these combined maps and is labeled on both maps. The Refuge also is known as "Conservation Area No. 1" and that name also appears on both of the USGS maps included in my affidavit as Attachment D. The portion of the Refuge shown on these maps is a mosaic of depressional cypress wetlands signified by mottled blue and green throughout that area. The extensive unfarmed areas north of the Refuge on Attachment D-1 were depressional wetlands similar to those in the Refuge in 1970 and are signified by similar mottled blue and green throughout those two maps. The

proposed location of the WCEC Project expansion is in the area of wetlands within the rectangular area outlined in white in the southwest corner of those wetlands, north of the Refuge and east of the label "TWENTY MILE BEND." Therefore, natural depressional wetlands historically comprised the vast majority of the proposed WCEC Project expansion site. It is my professional opinion that the historic wetlands on the proposed WCEC site are within the regulatory jurisdiction of the Corps defendant and that the proposed project expansion would require an Independent Permit, even if this segment was evaluated as an independent, unsegmented project. Similar wetlands, flood plains and other special aquatic sites and waters of the United States and waters of the state are apparent in the vicinity of the proposed WCEC Project expansion site on Attachments D-1 and D-2.

13. **Productive and valuable public resources** - Based on my review of historic and agency file documents, my site inspections and my personal knowledge of the expanded WCEC Project vicinity, the wetlands, flood plains, special aquatic sites and other waters that will be destroyed by all segments and infrastructure of the proposed WCEC Project expansion, including associated infrastructure such as the Gulfstream natural gas pipeline, historically were a "productive and valuable public resource," as referenced in 40 CFR § 230.10(b)(1).

14. **Food chain production and general habitat and nesting sites for aquatic or land species** - Those wetlands, flood plains, special aquatic sites and other waters performed functions important to the public interest, which included at least: food chain production and general habitat and nesting sites for aquatic or land species, as described by 40 CFR § 230.10(b)(2)(i).

15. **Study of the aquatic environment, sanctuaries and refuges** - Some of those wetlands, flood plains, special aquatic sites and other waters, have been set aside for study of the aquatic environment or as sanctuaries or refuges, as described in 40 CFR § 230.10(b)(2)(ii). Examples include, but are not limited to the Loxahatchee National Wildlife Refuge, the J.W. Corbett Wildlife Management Area and the Dupuis Wildlife and Environmental Area.

16. **Natural drainage characteristics, salinity distribution, and other environmental characteristics** - All of the segmented components of the proposed WCEC Project expansion and supporting infrastructure should have been evaluated as a single “Individual Permit” (“IP”) application by the Corps defendant. These segmented components will result in the destruction or alteration of wetlands, flood plains, special aquatic sites and other waters that have or will have detrimental affects on natural drainage characteristics, salinity distribution, or other environmental characteristics, contrary to 40 CFR § 230.10(b)(2)(iii).

17. **Natural storage areas for storm and flood waters** - Those wetlands, flood plains, special aquatic sites and other waters that are being destroyed or altered as a result of the referenced segmented project, historically were preventing both erosion and storm damage, and served as valuable storage areas for storm and flood waters, as described in 40 CFR § 230.10(b)(2)(iv) and (v), respectively. Those benefits no longer will be provided in the areas where those wetlands are destroyed or adversely altered.

18. **Natural groundwater discharge and recharge and water purification** - Those wetlands, flood plains, special aquatic sites and other waters

that are being destroyed or adversely altered by various segments of the proposed segmented WCEC Project expansion, without a valid Individual Permit from the Corps defendant, also are, or were, historic groundwater-discharge areas. Those areas maintained minimum baseflows important to aquatic resources and prime natural recharge areas, as described in 40 CFR § 230.10(b)(2)(vi). Consequently, those environmentally sensitive natural areas also were serving significant water purification functions, as identified in 40 CFR § 230.10(b)(2)(vii).

19. **Uniqueness** - Those wetlands, flood plains, special aquatic sites and other waters that are being destroyed or adversely altered as a result of the proposed WCEC Project expansion were unique in nature compared to wetlands in virtually all other states in the US (see: 40 CFR § 230.10(b)(2)(viii)). I found no indication that the Corps defendant had evaluated the wetland sites in the WCEC Project expansion vicinity or recognized the uniqueness of those wetlands, or that they were intimately linked with the Floridan aquifer system. Likewise, I found no indication that a comprehensive (or, in fact, any) analysis had been conducted of the myriad significant cumulative effects that would result from the entire segmented project, including the proposed WCEC Project expansion, as described in 40 CFR § 230.10(b)(3). Finally, I found no evidence that the Corps defendants had applied the "section 404(b)(1) guidelines", as required by 40 CFR § 230.10(b)(4), prior to permitting the alteration of those wetlands even as a Nationwide Permits (NWP) project.

20. **Failure to consider relevant information** - There was no indication

that the numerous adverse cumulative impacts that have occurred and will occur as the result of the destruction or significant alteration of wetlands, flood plains, special aquatic sites and other waters in the vicinity of the proposed WCEC Project expansion were considered by the Corps defendant. Categories for consideration include fish and wildlife (40 CFR § 230.10(c)); water quality (40 CFR § 230.10(d)); historic, cultural, scenic, and recreational values (40 CFR § 230.10(e)); property ownership (40 CFR § 230.10(g)); activities affecting coastal zones (40 CFR § 230.10(h)); activities that may affect marine sanctuaries (40 CFR § 230.10(i)); compliance with other federal, state, or local requirements (40 CFR § 230.10(j)); floodplain management (40 CFR § 230.10(l)); water supply and conservation (40 CFR § 230.10(m)); energy conservation (40 CFR § 230.10(n)); environmental benefits (40 CFR § 230.10(p)); and economics (40 CFR § 230.10(q)).

21. **Preclusion of public comment** – All of the segments, including infrastructure, were not publicly advertised by the Corps defendant because the segmented components of the proposed WCEC Project expansion were not evaluated as a single Individual Permit by the Corps defendant. Therefore, the public - including "other experts on matters within their expertise" (such as scientists like myself) – were prevented from submitting comments to the Corps defendant about the types of adverse impacts described in this affidavit. Consequently, the Corps (and other agencies) could not "fully consider" those impacts without the knowledge provided by public comments.

22. **Injury to property, invasion of other rights and superseding the**

rights and interests of the public - Many of the segments, if constructed and operated, will result in, or already have resulted in "injury to property or invasion of other rights" beyond the site of the proposed, segmented project, thus superseding the rights and interests of the public. For some segments, the property is not even owned by the entity constructing that segment of the proposed WCEC Project expansion or their associates, contrary to the provisions of 40 CFR § 230.10(g) and 40 CFR § 230.10(g)(1), respectively. Some components are being constructed on environmentally sensitive land "protected" as public lands.

23. **Pattern and practice of Corps defendant's failure to consider relevant information** – At least one of the segments/supporting infrastructure of the proposed WCEC Project expansion was issued an NWP by the Corps defendant. I have evaluated numerous projects that were permitted as NWP projects by the Corps. My evaluation determined that the adverse impacts to (loss of) wetlands associated with each of those NWPs far exceeded 10 acres. The Corps defendant's failure to recognize the significant types and magnitude of adverse impacts (such as groundwater-related impacts) from single NWP projects permitted in Florida makes it impossible for the Corps defendant to recognize and consider the adverse cumulative impacts of segmented projects, even if evaluated as Individual Permits. In fact, from 1992 through the first three quarters of 2001 the Corps defendant reportedly approved 25,767 permits. Only 34 permits were denied by the Corps defendant in Florida in that nine-year span. During the period of 1998 through 2002, the Corps defendant reportedly approved 8,300 permits for wetland destruction in

Florida, while denying only a single permit during that period. More than 60% of those projects were authorized by the Corps defendant as NWP's.

D. IRREPARABLE HARM TO THE EVERGLADES WATERSHED AND EVERGLADES RESTORATION FROM ADVERSE IMPACTS

24. **The uniqueness of the Everglades ecosystem** – The significance of the Everglades ecosystem most recently was summarized in Judge Alan S. Gold's Order dated July 29, 2008, as follows (footnotes omitted, See *Miccosukee Tribe of Indians of Florida and Friends of the Everglades v. United States of America, et al.*, Case 1:04-cv-21448-ASG):

Few would disagree that the Everglades is unique. It is unlike any other ecosystem⁷ on earth. It is a national treasure and requires our utmost protection. The Congress of the United States has said this. So has the Florida Legislature. Congress has declared that the Everglades is an "American treasure" which includes uniquely important and diverse wildlife resources and recreational opportunities. Water Resources Development Act of 2000, Public Law 106-541, § 602 (Dec. 11, 2000). Congress has found that the preservation of the pristine and natural character of the South Florida ecosystem is critical to the regional economy. *Id.* Based on these findings by Congress, along with the formal designations of Everglades National Park and Loxahatchee National Wildlife Refuge, the entire Everglades Protection Area fits the definition of "waters of exceptional recreational and ecological significance," as set forth in 40 C.F.R. § 131.12(3).⁸ Like the United States Congress, the Florida Legislature has acknowledged the watershed's one-of-a-kind nature in the opening paragraph of the 1994 EFA. It proclaimed that the Everglades is irreplaceable and stated: "The system is unique in the world and one of Florida's greatest treasures." Fla. Stat. § 373.4592(1)(a). Indeed, the State of Florida has designated the Everglades National Park and the Loxahatchee National Wildlife Refuge as "Outstanding Florida Waters" under Sections 62-302.700(9(a)(3), 9(b)(17) of 9 the Florida Administrative Code, thereby providing these waters the highest standard of protection. Moreover, under Florida law, the Everglades National Park is also an Outstanding National Resources Water. F.A.C. § 62-302.700(10).

25. **Irreparable harm to the Everglades watershed and Everglades restoration** – The Corps defendant records permit applications and issued permits by counties, rather than watersheds. This approach further prevents the Corps from determining direct, indirect and cumulative impacts on watersheds, such as the Everglades basin. It is my professional opinion that the segments of the proposed WCEC Project expansion, if constructed and operated as proposed, will result in irreparable harm to the Everglades watershed and the multi-billion dollar Everglades restoration effort. This harm includes physical environmental harm that, in my professional opinion, cannot be repaired.

26. **Irreparable harm from extraction of unavailable water** - The water use for only two units in the vicinity of the proposed segmented WCEC Project expansion and supporting infrastructure would require the extraction of 605 million gallons of water per month or an average of 12.8 Million Gallons per Day (MGD) of surface and ground water. This volume of water use was referenced in permit application 040402-10 received by the South Florida Water Management District (SFWMD) on April 5, 2004. A copy of that document is incorporated herein as Attachment E-1. On May 16, 2007, Palm Beach County administration confirmed in a memorandum that this water use was the equivalent of water use for approximately 50,000 houses. A copy of that memorandum is incorporated herein as Attachment E-2. In my professional opinion, this proposed water use would result in physical environmental harm that cannot be repaired.

27. **Irreparable harm from hydroperiod alterations** – Wetlands, flood

plains, special aquatic sites and wildlife habitat in Florida are dependant on the natural hydroperiod. Hydroperiod components include: a) the depth or stage of fluctuating ground and surface water; b) the duration of the water level at a given depth and stage; and c) the periodicity and seasonality of the water level fluctuations. Alterations to the natural hydroperiod already have resulted in significant adverse impacts to wetlands, flood plains and other special aquatic sites and waters in the vicinity of the proposed WCEC Project expansion due to the failure of Corps defendants and other agencies to consider the adverse direct, indirect and cumulative impacts of previously constructed segments and infrastructure. These hydroperiod alterations include significant dewatering of the aquifer system by the co-located mining operations. It is my professional opinion that the hydroperiod alterations from the proposed project expansion would result in physical environmental harm that cannot be repaired.

28. **Irreparable harm from destructive wildfires** – One example of the irreparable harm from hydroperiod alterations is destructive wildfires. Destructive wildfires caused by alteration of natural hydroperiods are described in the peer-reviewed scientific paper that I published in 2007, which is incorporated herein as Attachment F. The significant adverse impacts from these hydroperiod alterations are causing irreparable harm to Everglades restoration, the Loxahatchee National Wildlife Refuge, Dupuis Wildlife and Environmental Area, J.W. Corbett Wildlife Management Area, Lake Okeechobee, Loxahatchee Slough and River, including the Grassy Waters Preserve and other natural wetlands, flood plains, streams, coastal

waters and the aquifer system.

29. **Irreparable harm from additional large-scale water use** – The SFWMD permit application file 040402–10 for the WCEC Project segment, referenced as the “FPL Corbett Project,” indicates that a minimum of 12.8 Million Gallons per Day of additional water would be extracted from the Everglades for this proposed expansion. See Attachment E-1, page 2. That application was for “the initial construction of up to 1,100 MG’s [MegaWatts] of electrical generation. Despite this initial request, the application indicates that “[T]he site is currently zoned for the development of up to 3,300 MW of electric generation.” See Attachment E-1, page 17. That zoned capacity of 3,300 MW is comparable to the stated capacity of 3,705 MW for the Martin County segment of the project expansion. See Tsolkas’ web attachment from <http://www.industcards.com/top-100-pt-3.htm>. The 12.8 Million Gallons per Day water use for the proposed WCEC project expansion excludes water use associated with infrastructure expansion, such as the Gulfstream gas pipeline segment expansion. That proposed additional water use would result in the expansion of both the extent and magnitude of the irreparable harm to those environmentally sensitive areas if the segmented project is constructed and operated as proposed.

30. **Greater harm than from alternatives** – If the segmented expansion project had been subjected to a comprehensive Environmental Impact Statement (EIS) review by the Corps defendant, as required by federal laws, the impacts of alternative fuel sources, such as solar, would have been evaluated. The Virginia

Tech Water Resources Research Center published a paper comparing the water-use impacts of various fuel sources for the production of electricity. A copy of that paper titled, “The intertwined tale of energy and water” is incorporated herein as Attachment G-16. That paper begins with the statements “Jaques Cousteau once said, ‘sometimes we forget that the water cycle and the life cycle are the same.’ What Cousteau meant was that not only the human survival but also all life on earth totally depends upon water.” Table 1 of that Virginia Tech paper shows that a minimum of 145 gallons is required to extract the amount of liquefied natural gas to produce a million British Thermal Units (BTU) of pure energy as heat. No water is required to “extract” solar energy. Table 2 of that paper shows that an additional 1,100 to 2,200 gallons of water is required to use the extracted fossil fuel to generate a million BTUs of pure energy as heat. Solar thermoelectric fuel requires only 230 to 270 gallons of water to generate the same energy. Therefore, approximately 9 times the amount of water is required for energy produced by that natural gas compared to using solar thermoelectric power for energy.

31. **Irreversible subsidence** – In my professional opinion, if additional extraction of surface and ground water occurs, as requested for the proposed segmented WCEC Project expansion and supporting infrastructure, it will result in irreversible soil subsidence in wetlands, flood plains, special aquatic sites and wildlife habitat in the vicinity of the proposed WCEC Project expansion. The defendants have failed to consider the adverse direct, indirect and cumulative impacts of irreversible soil subsidence on the environmentally sensitive areas in the

Everglades watershed, including those listed above. The defendants also have failed to consider the adverse direct, indirect and cumulative impacts of irreversible soil subsidence on habitat critical to the survival and recovery of federally listed species.

32. Irreparable harm from aquifer injection of acidified industrial “waste water” and sewage effluent - The proposed segmented WCEC Project expansion with supporting infrastructure intends to inject into the aquifer acidified industrial “waste water” and sewage effluent generated at the proposed WCEC site. If that injection of acidified industrial “waste water” and sewage effluent occurs, as requested for the proposed segmented WCEC Project expansion and supporting infrastructure, it will result in increased and irreversible dissolution of the karst aquifer system in the Everglades watershed. It is my professional opinion that this will result in further harmful alteration of the natural hydroperiod in the vicinity of the proposed segmented WCEC Project and supporting infrastructure, as well as the harmful alteration of water quality in Waters of the US and waters of the state, including nearshore coastal waters.

E. ACTIONS JEOPARDIZING SURVIVAL AND RECOVERY OF FEDERALLY LISTED SPECIES, ADVERSE MODIFICATION OF CRITICAL HABITAT AND UNPERMITTED TAKING DUE TO FAILURE TO CONSIDER ADVERSE DIRECT, INDIRECT AND CUMULATIVE IMPACTS

33. Habitat critical for survival and recovery of listed species –
Irreparable harm to the natural hydroperiod in Florida ultimately results in irreparable harm to habitat critical for the survival and recovery of species, such as wood storks, red cockaded woodpeckers and Eastern indigo snakes. Wood storks (*Mycteria*

americana) and red cockaded woodpeckers (*Picoides (=Dedrocopos) borealis*) are listed as endangered by the U.S. Fish and Wildlife Service (USFWS). Eastern indigo snakes (*Drymarchon corais couperi*) are listed as threatened by the USFWS. See: “South Florida Multi-Species Recovery Plan” prepared for USFWS Southeast Region, Atlanta, GA, May 18, 1999.

34. **Depressional wetlands as habitat critical to the survival and recovery of wood storks** – Wood storks in Florida rely on natural depressional wetlands such as cypress domes and sloughs and wet prairies for both foraging and nesting. Natural depressional wetlands in Florida are among the most sensitive wetlands to hydroperiod alteration. The adverse direct, indirect and cumulative impacts of segments and supporting infrastructure of the proposed WCEC Project expansion would result in irreversible destruction of significantly more than ten acres of natural depressional wetlands which could be used by wood storks for foraging and nesting.

35. **Natural pine forests as habitat critical to the survival and recovery of red cockaded woodpeckers** –Successful nesting and reproduction of red cockaded woodpeckers require older growth stands of live native pine trees. Native species of pines are among the most sensitive native trees to hydroperiod alteration. The adverse direct, indirect and cumulative impacts of segments and supporting infrastructure of the proposed WCEC Project expansion would result in irreversible destruction of significant stands of natural pine which could be used by red cockaded woodpeckers for nesting.

36. **Gopher tortoise burrows as critical refugia for Eastern indigo**

snakes – The Eastern indigo snake was granted “full protection” in Florida in 1971. The indigo snake uses gopher tortoise burrows as both a refugia and overwintering site. They are often common along canal banks in Florida. See the 1981 USFWS Eastern Indigo Snake Recovery Plan. Despite being granted “full protection,” the refugia critical for the survival and recovery of Eastern indigo snake are being destroyed by the adverse direct, indirect and cumulative impacts of segments and supporting infrastructure of the proposed WCEC Project expansion.

37. **Examples of increasing extent and severity of impacts** - The Barley Barber power plant in western Martin County is an earlier segment of this phased project, with supporting infrastructure. That 3,705 MegaWatt segment north of the Palm Beach County line has resulted in an increasing extent and severity of adverse impacts that were not considered by the Corps or other defendants. The expansion proposes to connect the Barley Barber facility to the WCEC Project expansion in Palm Beach County by the Gulfstream natural gas pipeline segment. The Barley Barber plant and large bermed cooling pond are in the immediate vicinity of environmentally sensitive areas including, but not limited to, the Dupuis Wildlife and Environmental Area, J.W. Corbett Wildlife Management Area, Lake Okeechobee Ridge Park and Lake Okeechobee. The immediate proximity of these segments and supporting infrastructure to those environmentally sensitive areas is shown in the aerial-photo map that is incorporated into my affidavit as Attachment H. This map identifies the cooling pond infrastructure for the Barley Barber segment as the “St. Lucie Canal power plant cooling pond” and Lake Okeechobee Ridge Park is

located in the vicinity of #7 on that aerial-photo map. Attachment I, also incorporated into my affidavit, includes a copy of two 1:24,000-scale historic USGS maps, reduced to 8.5" x 11", of the same area as the aerial-photo map. Attachment I-1 is the 1953 historic map titled "Okeechobee 4 SE, FLA." Attachment I-2 is the same map, photorevised in 1983 and renamed, "Barley Barber Swamp, FLA." The purple additions on the photorevised version illustrate the large-scale excavation that was under construction in 1983 for the Barley Barber segment cooling pond. Each of the red squares with a number in the center in those historic USGS maps represents a square mile. Based on that scale, approximately 13 square miles was excavated and bermed for the Barley Barber segment cooling pond. The dredging and discharge of fill material to construct that cooling pond occurred in the historically navigable waters of the Barley Barber stream channel and extensive associated floodplain wetlands and natural depressional wetlands. See Attachment I-2. Because of the construction of the bermed cooling pond, the Barley Barber stream and flood plains no longer are navigable.

38. **Photographs of increasing extent and severity of impacts at Lake Okeechobee Ridge Park** - Attachment J, also incorporated into my affidavit, includes photographs that I took on July 16, 2008. Those photographs illustrate the irreparable harm from the adverse impacts associated with the Barley Barber project segments referenced above. These photographs were taken along the Lake Okeechobee Ridge Park trail, in the vicinity of location #7, shown on the aerial-photo map included in Attachment H. The first photograph in Attachment J is the welcome sign for the Lake Okeechobee Ridge Park describing the many "gigantic old growth

cypress and oak trees” in the park. The second photograph in Attachment J illustrates fungal growth, also known as conks, on standing dead cypress in the park. The third and final photograph in Attachment J shows one of the old growth cypress trees exhibiting “windthrow,” the forest pathology term to describe trees subjected to fungal decay of the roots and/or base of the trunk. See Attachment J-1, J-2 and J-3, respectively.

39. **Photographs of increasing extent and severity of impacts at Dupuis Wildlife and Environmental Area** – Attachment K, also incorporated into my affidavit, includes seven additional photographs that I took on July 16, 2008. Those photographs illustrate additional irreparable harm from the adverse impacts associated with the Barley Barber project segments referenced above, in the Dupuis Wildlife and Environmental Area. The first photograph shows the entrance sign, taken in the vicinity of location #8, shown on the aerial-photo map included in Attachment H. The second photograph shows an additional entrance sign, indicating that financial support of that public property was from the “Save Our Rivers” fund. The remaining photographs in Attachment K show extensive stands of prematurely dead and declining native trees occurring throughout the Dupuis Wildlife and Environmental Area, in addition to windthrow and signs of subsidence, destructive wildfires and invasive alien plant species. See Attachment K-1 through K-7. The final photograph was taken in the vicinity of location #10 in the Dupuis Wildlife and Environmental Area, as shown on the aerial-photo map included in Attachment H. This photograph shows banded native pine trees in a stand

designated as red cockaded woodpecker habitat and is supporting a population of federally endangered red cockaded woodpeckers. The pine trees in this stand, critical to the survival and recovery of this endangered species, also are experiencing premature death and decline.

40. **Impacts from segmentation** – It is my professional opinion that the premature death and decline of the native trees, in the Lake Okeechobee Ridge Park and the Dupuis Wildlife and Environmental Area, in addition to the subsidence, destructive wildfires and invasive alien plant species are the result of the construction and operation of the Barley Barber cooling pond segment of this phased project. A description of the early regulatory history of the Barley Barber cooling pond segment of this phased project is provided in the “Revised Permit Agreement,” “Amendment Two to the Revised Permit Agreement” and “Amendment One to the Revised Permit Agreement,” incorporated into my affidavit as Attachment L. See Attachment L-1 through L-3, respectively. Furthermore, because the megawatt capacity and water use of the Barley Barber segment is comparable to the megawatt capacity and water use of the proposed WCEC Project, it is my professional opinion that comparable environmental damage will be caused by the proposed segments to all of the environmentally sensitive areas in the vicinity of the proposed expansion. These environmentally sensitive areas include, but are not limited to the multi-billion dollar Everglades restoration effort funded by local, state and federal tax revenue, the Loxahatchee National Wildlife Area, the J.W. Corbett Wildlife Management Area and Loxahatchee Slough and River, including the Grassy Waters

Preserve. It is my professional opinion that the segmentation and supporting infrastructure of the proposed WCEC Project expansion, with associated infrastructure expansion, will result in additional direct, indirect and cumulative impacts to wildlife habitat critical to the survival and recovery of federally listed species including, but not limited to wood storks, red cockaded woodpeckers and Eastern indigo snakes. These adverse impacts will result in the unlawful taking of these federally endangered and threatened species, in violation of Sections 7 and 9 of the Endangered Species Act. Finally, it is my professional opinion that the physical environmental harm described above cannot be repaired.

F. ADVERSE IMPACTS TO THE QUALITY OF THE NATION'S AIR RESOURCES

41. **Increased carbon dioxide from dead and declining trees** – Living trees are significant carbon sinks. Carbon sinks are storage components for carbon. It is my professional opinion that large-scale, widespread death of native upland and wetland trees, such as pines and cypress, will occur from the direct, indirect and cumulative impacts of the proposed expansion of this segmented project, including supporting infrastructure, if this project is constructed and operated as proposed. The large-scale, widespread death of slow-growth trees from the segmented project will release significant levels of stored carbon and increase carbon dioxide levels in the air significantly above the levels of carbon dioxide released from the use of fossil fuels by the proposed project expansion. This additional impact was not considered by the Corps and other defendants.

42. **Increased particulate matter from destructive wildfires** – It is my

professional opinion that the destructive wildfires that have occurred in the vicinity of the existing segments of this phased project resulted from hydroperiod alterations, such as those associated with the cooling pond for the Barley Barber segment. Furthermore, it is my opinion that the proposed WCEC Project expansion, including expanded infrastructure such as the Gulfstream pipeline segment, will result in an increase in the severity and extent of these destructive wildfires. These destructive wildfires will convert trees and organic soils into significant airborne particulate matter that cannot be controlled or reduced by technology associated with the proposed segments. A significant amount of this particulate matter ultimately will be deposited into the surrounding waters.

43. **Increased mercury and agricultural contaminants from destructive wildfires** – It is my professional opinion that when the destructive wildfires referenced above ignite the dewatered organic soils, mercury and agricultural contaminants in those soils will be released into the air. A significant amount of these airborne contaminants also will be deposited into the surrounding waters.

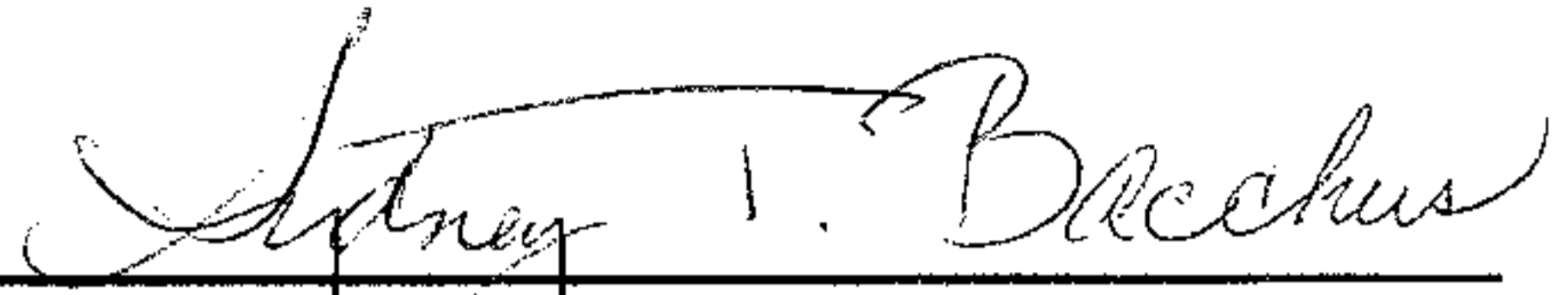
G. SUMMARY

44. **Summary** - In summary, it is my professional opinion that the defendants' actions and inactions, including the failure to require: a) an Individual Permit from the Corps defendant, b) a comprehensive Environmental Impact Statement ("EIS"), and c) a Cumulative Impacts Analysis for all segments and supporting infrastructure of the proposed WCEC Project will result in irreparable

harm to environmentally sensitive areas in the vicinity. Those areas include, but are not limited to the Everglades watershed, the multi-billion dollar Everglades restoration effort funded by local, state and federal tax revenue, the Loxahatchee National Wildlife Refuge, the J.W. Corbett Wildlife Management Areas, the Dupuis Wildlife and Environmental Area, Lake Okeechobee, Loxahatchee Slough and River, including the Grassy Waters Preserve and other natural wetlands, flood plains, streams, coastal waters and the aquifer system due to the failure of agencies to consider all of the adverse direct, indirect, and cumulative impacts, as required by law.

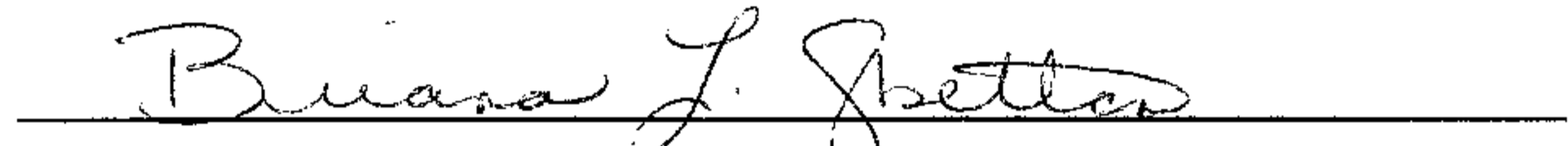
Furthermore, it is my professional opinion that these adverse impacts will result in the unlawful taking of federally endangered and threatened species, in violation of Sections 7 and 9 of the Endangered Species Act. Finally, it is my professional opinion that the physical environmental harm described above cannot be repaired.

FURTHER AFFIANT SAYETH NOT.



Sydney T. Bacchus, Ph. D.

SWORN TO AND SUBSCRIBED before me the 28 day of August
2008, by the Affiant, Sydney T. Bacchus, who is personally known to me or who has
produced GADL 053201838 as identification.



NOTARY PUBLIC, State of Georgia
My commission expires:

Commission No.:

