August 17, 2010

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of	)	
	)	Docket Nos. 52-029-COL
Progress Energy Florida, Inc.	)	52-030-COL
	)	
(Combined License Application for	)	
Levy Nuclear Plant, Units 1 and 2)	)	ASLBP No. 09-879-04-COL

AFFIDAVIT OF MITCHELL L. GRIFFIN IN SUPPORT OF PROGRESS'S MOTION FOR SUMMARY DISPOSITION OF JOINT INTERVENORS CONTENTION 4

MITCHELL L. GRIFFIN states as follows under penalties of perjury:

1. I am a Principal Technologist in Water Resources with CH2M HILL, Inc., an engineering company representing Progress Energy Florida, Inc. (PEF) for the Levy Nuclear Plant, Units 1 and 2 (LNP).
2. My professional and educational experience is summarized in the curriculum vitae included as Attachment 1 to this affidavit. I hold a Doctorate of Philosophy degree in Agricultural Engineering from Purdue University and a Bachelor of Science degree in Civil Engineering and a Master of Science degree in Agricultural Engineering from the University of Kentucky. I am a Professional Engineer (P.E.) in the States of Florida, Georgia, and Louisiana.
3. In my capacity as the surface water resources engineer for the proposed LNP project, I am responsible for providing technical support on the NPDES permit application and conducting senior review of surface water hydrologic evaluations. I am knowledgeable of passive dewatering issues related to LNP, stormwater, and the effects of dewatering on surface waters, including Outstanding Florida Waters (OFWs). I have reviewed the analysis and provided advice and input for preparation of the Environmental Report (ER). Specifically, I am knowledgeable of and have provided advice and input on formulating portions of the ER and the Site Certification Application (SCA) related to surface water hydrology and National Pollutant Discharge Elimination System (NPDES) permit application. I provided testimony during the SCA hearings on the NPDES application and related water quality

issues, affects of the LNP project on the CFBC and portions of the Withlacoochee River, and also the groundwater impacts near the Cross Florida Barge Canal (CFBC). I am familiar with the Draft Environmental Impact Statement (DEIS) published on August 5, 2010.

4. I am familiar with Joint Intervenors Contention 4, which was raised by the Joint Intervenors in the U.S. Nuclear Regulatory Commission (NRC) licensing proceeding for the LNP plant licensing. As admitted into the proceeding by the Atomic Safety and Licensing Board (Board) and clarified by the Commission, Contention 4 asserts that the PEF ER is deficient, in part, because it fails to adequately address, and inappropriately characterizes as SMALL, certain specific environmental impacts resulting from passive dewatering on the affected aquatic resources of (a) the aquifer system underlying the project area and (b) the OFWs such as Withlacoochee and Waccasassa Rivers. The Board narrowed the submitted Contention 4 from the broad, non-specific discussion of "wetlands, floodplains, special aquatic sites, and other waters" to (a) the aquifer system underlying the project area and (b) the Withlacoochee and Waccasassa Rivers.[1]

5. My declaration addresses claims raised by the Joint Intervenors in Contention 4 concerning passive dewatering and stormwater effects on (a) the aquifer system underlying the project area, and (b) the Withlacoochee and Waccasassa Rivers. I also identify other sensitive surface water bodies, OFWs, wetlands, and floodplains for context.

6. For the LNP project, I prepared the sections of the SCA that dealt with surface water impacts, including the preparation of the NPDES and Environmental Resource Permit (ERP) applications. I was responsible for preparing the NPDES application and follow-up information requests with the Florida Department of Environmental Protection (FDEP) on that federal permit. I provided senior review and advice to the LNP designers, Sargent & Lundy and The Shaw Group, Inc., on how to comply with Florida stormwater regulations. As part of the Section 316 Clean Water Act studies, I led

[1] The affected resources include onsite freshwater wetland areas, but Contention 4 as restated by the Board states that addressing impacts to that resource is specific to salt drift, which is not within the scope of my Affidavit.

the evaluation of the flows into the CFBC from Lake Rousseau, the water quality data from the CFBC and the Gulf, potential flow and water quality of the LNP discharge, and flows from Lake Rousseau into the lower Withlacoochee River. The SCA heavily referenced the ER, which I also reviewed during its development. The ER was submitted as Appendix 10.11 to the SCA. The ERP application was Appendix 10.4 of the SCA. As part of the administrative hearing for the SCA, I provided testimony on the NPDES permitting issues and potential changes to groundwater salinity near the CFBC. I was accepted in the Florida SCA proceeding as an expert on NPDES and groundwater impacts near the CFBC. After the Consent Order was issued, I performed senior review of additional floodplain evaluations that were conducted to assess the amount of fill in wetlands (for the Section 404 CWA permit) and changes to the 100-year flood levels. I have also helped to prepare plans of study to conduct monitoring of water quality in the Gulf of Mexico prior to and after LNP operation.

Passive Dewatering Definition

7. Passive dewatering is defined as the removal of site water through non-mechanical means (no pumping involved). Passive dewatering most often occurs from manmade drainage designed to remove site water to facilitate a new land use. In this affidavit, site water may include surface water, stormwater, and runoff (another term for stormwater) that are often used synonymously. Some rural lands and developments (like subdivisions) attempt to "dry-up" wet conditions through lowering near-surface groundwater levels by either underground drain tiles, pipes, or ditching. Another potential impact occurs downstream when small creeks or flow-ways are mechanically altered to remove site water from the land quickly without careful planning and engineering. In other instances the natural groundwater system of a site could be altered indirectly through profile modification, like deep excavations conducted by mining activities.

8. No passive dewatering is included in the LNP project; rather, features of the project are included to avoid the type of activities that will cause dewatering. New facilities are being built on a raised "island" above ground and drainage facilities around the new buildings and roads are designed to detain stormwater, releasing it in a controlled manner onsite to the natural landscape. Surface water

will not be ditched offsite through channels and, therefore, will not cause rapid runoff. Open mine pits will not occur at the LNP site; therefore, profile modification that will cause passive dewatering will not occur. The LNP project will generally sit on top of the natural landscape, collect and treat stormwater from the new buildings and roads, release stormwater from the new facilities in a controlled manner onto the natural ground (onsite), and let any runoff occurring from "up-hill" to flow through the site in a manner that will not increase peak runoff flow rates. These items are described further in the following paragraphs.

Stormwater Facilities at LNP

9. The LNP site (specifically, the location of the main power generation facilities including buildings and cooling towers) will be elevated above the natural ground surface by approximately 8 feet (ER 3.6.3.2, ER 4.1.1.1.2, DEIS 4.1.1) creating a higher "island" that raises the powerblock, cooling towers, and associated service buildings above the floodplain (DEIS 3.3.1.13). Drainage from the elevated LNP site will be piped or ditched to collect in three large stormwater ponds surrounding the raised landscape, that will hold water at or above the natural ground level (ER 4.1.1.1.2, DEIS Figure 3-4). The ponds will have raised dikes surrounding them to keep the collected stormwater staged above ground level. These ponds are called "wet ponds" in Florida because the pond bottoms will be below the natural groundwater level, so there will always be some open water in the ponds. Over the last three decades wet ponds have emerged as the preferred stormwater treatment method because they have a proven track record of nutrient and sediment removal. The depth of the ponds will be consistent with FDEP guidelines that will limit the average depth of the ponds (about 6 to 8 feet average depth below the ground). The stormwater collected in the wet ponds will be detained to treat the water to allow sediment and solids to settle and trap in its lower portion. The stormwater will be exposed to sunlight and vegetation that will allow for natural processes to treat nutrients and other pollutants. The surrounding dike will have a spillway that releases high levels of stormwater down to the natural ground, which will be dispersed on the downstream side to prevent erosion or scouring, and allowed to flow into the onsite landscape. All of these features will minimize the stormwater

effects from the LNP project and constitute the current standard of practice for stormwater management in Florida.

10. The roadways to the LNP site will be elevated above natural grade and treat stormwater in surrounding swales that will discharge to surrounding wetlands (SCA Appendix 10.4). Swales are wide, shallow grassy areas that will treat the stormwater from the roadways by filtering (shallow flow across grassy area) and percolation that will reduce solids and sediment in the runoff. Some culverts will be installed under the roads at natural flow paths to allow stormwater to drain from higher ground elevations to lower ground elevations to preserve the natural flow patterns of the overall landscape. There are no onsite ditches now and there will be no ditches leading offsite in the future. Water passing through the culverts will be dispersed on the downstream side and allowed to flow into the onsite landscape in areas that maintain the general flow paths of the property prior to the LNP project. These equalizer culverts are necessary to avoid redirecting the overall site water to other locations.

11. There will be no profile modifications that would alter the subsurface soils or water levels to depths that would be considered significant from a geologic standpoint. The stormwater facilities are being designed to account for the natural seasonal high water table that is near the ground surface (ER 4.1.1.1.2). Stormwater is release from the wet ponds over the crest of the main spillways (approximately 1 foot above the natural ground) and small pipes at natural ground level that slowly release water. Dikes surround the ponds because the water levels in the ponds will fluctuate between natural ground level and the raised powerblock. There will be no construction that will modify the soil profiles so deeply that it may induce indirect drainage because new facilities are above grade and the primary water control features (stormwater ponds) will maintain water levels at or above the seasonal high water table, so the near-surface groundwater levels will not be artificially lowered.

12. The Florida Final Order on Certification included the floodplain requirements of the Levy County Code of Ordinances, *Chapter 50 Article VI Flood Damage Protection* (Levy County, 1991), and the Southwest Florida Water Management District (SWFWMD), the local regional state agency, in the Conditions of Certification (COCs, Attachment B of the Final Order on Certification). The FDEP is

identified as the lead review agency for local and state requirements. The SWFWMD requirements are to protect adjacent property owners from increased flood stages and to prevent water quality and quantity impacts associated with stormwater from developments.

13. Florida has been proactive in regulating stormwater since the early 1980s. No new development that may change stormwater, use sovereign land, or conduct dredge and fill in waters of the state can be built without state approval, which is commonly addressed by meeting ERP requirements. ERP requirements are established by the local water management district, SWFWMD in this case and have been incorporated into the COCs. Engineers rely on the water management district's guidelines and rules in designing stormwater management facilities. LNP drainage facilities must meet the criteria shown in the SWFWMD ERP Basis of Review (BOR) as adopted by the FDEP in 2006 (see Rule 62-330.200(3), Florida Administrative Code [F.A.C.]). The BOR (the adopted SWFWMD BOR, 2006 version, is provided as Attachment 2) contains the pertinent criteria that the LNP project must meet so this project will have no offsite impacts or indirect passive dewatering. Pertinent criteria can be summarized as follows:.

A. It is permissible to allow wetlands on your property to receive stormwater and to consider their compensating storage effect when estimating impacts (BOR 4.9).

B. No offsite impacts can result during a 100-year storm, which is 11.3 inches of rainfall in 24 hours at LNP (BOR 4.4).

C. If one places fill in low lands, including wetlands, they must replace the stormwater volume that would have stayed onsite prior to development (BOR 4.7).

14. In total, when the LNP site meets the criteria in Paragraph 13, no offsite effects will occur and the recharge of stormwater into the underlying aquifer system will not be reduced. The reasons why these provisions mitigate potential impacts are explained in detail in the following paragraphs.

15. The SWFWMD BOR requires that the quantity of stormwater runoff be regulated to prevent offsite impacts by controlling peak stormwater runoff rates from a 25-year, 24-hour storm (8.5 inches of

rainfall). The post-development peak runoff rate must be less than or equal to the pre-development rates to prevent an increase in offsite flooding. This is a basic Florida requirement that all projects must meet to get an ERP permit. This requirement will be managed on the LNP site by directing the stormwater to the wet ponds that surround the raised power plant island. The three large stormwater ponds at the LNP site were sized to collect and hold the entire runoff from the 100-year storm (11.3 inches) without overtopping even if there were no outlets. Stormwater will be stored in the three wet ponds and released more slowly (SCA Appendix 10.4). The shallow, broad-grassed swales slow down the stormwater runoff from roadways and cause some ponding prior to release to the natural landscape. The peak runoff rate from the centrally located LNP site facilities is further attenuated as stormwater flows into the undisturbed landscape and wetlands that surround the actual development. Because of the stormwater detention ponds, roadside swales, and the central location of the developed area compared to the site boundary, I expect that runoff flow rates at the LNP site boundary will not exceed runoff rates prior to development.

16. Stormwater quality is also regulated by the FDEP and is addressed by the SWFWMD BOR. Florida has some of the most stringent stormwater quality treatment requirements in the nation. Projects designed to meet the SWFWMD criteria provide reasonable assurance of compliance with the state water quality standards. On average at any given location in Florida there are about 120 storms per year, with about 70 of them greater than 0.5 inch of rainfall. Stormwater treatment of 1 inch of rainfall will completely treat about 85 percent of the average annual rainfall volume because most of the storms are small. The wet ponds surrounding the powerblock collect and slowly dewater the runoff volume from 1 inch of rain. While all of the runoff is treated, 85 percent of the volume will be subject to a longer detention time, which enhances treatment including removing sediment. Wet ponds provide superior stormwater treatment when compared to other treatment types. The ponds will have wetland plants across at least 35 percent of the shallow areas to filter and use nutrients. The open water areas are exposed to sunlight (ultraviolet radiation) that will reduce some pollutants and allow algae to remove more nutrients. A moderately deep permanent pool will prevent scouring and allow

longer detention time for settling between storm events. The small pipe at natural ground level in the spillway will be sized to restore the treatment volume in about 5 days; because it rains on average every 3 to 5 days in Florida. These three wet ponds are the best alternatives for treating the runoff from the LNP powerblock.

17. Swales are required to be designed to ensure shallow flow that will provide treatment benefits from filtration through grass. Swales are required in Florida to be at least 12 feet wide and about 1 foot deep. A typical design cross section provided in the SCA shows the swales along the haul road to be approximately 46 feet wide to allow ample storage in the LNP's swales to collect and treat runoff from the road (Appendix 10.4, Attachment A.3, Drawing LNG-G1-X0-043).

18. Floodplain 100-year flood water levels were evaluated in two separate efforts by CH2M HILL personnel. I provided senior quality control reviews for both evaluations conducted under my general direction and agreement by CH2M HILL engineers. The first evaluation was an estimate of the amount of fill that would be placed in the delineated 100-year floodplain. The 100-year floodplain is defined by the Federal Emergency Management Agency (FEMA) on their Flood Insurance Rate Maps (FIRMs). This map was constructed by FEMA using aerial photographs and Soil Conservation Service soil mapping, a typical approach used in rural areas to construct FIRMs where no detailed flood level evaluations are available. This first evaluation by CH2M HILL quantified the fill volume that may displace stormwater volume on the site within the mapped 100-year flood boundaries. The results of the first evaluation demonstrated that there would be enough land available onsite to compensate for the loss of floodplain storage if soil had to be removed to provide compensation. These results were provided to the U.S. Army Corps of Engineers (USACE) for their consideration of the total land area that may be impacted by the LNP project. CH2M HILL and PEF called this the "Floodplain Bounding Analysis" because it represented a worst-case scenario if more land were needed to mitigate fill effects on stormwater.

19. USACE, FEMA, and FDEP will rely on the results of a more detailed analysis (the second evaluation). The second evaluation of the 100-year floodplain for the LNP site was conducted using

the U.S. Environmental Protection Agency (EPA) Storm Water Management Model (SWMM) (Version 5, 2009) computer model, which is a FEMA-approved software program used to determine the elevation of the 100-year floodplain. The SWMM modeling estimated the stormwater runoff and flow rates and water depths considering storage in wetlands, water backing up as it flows through culverts, and flow across broad shallow flow ways, which are critical for flood modeling in flat landscapes. The existing ground elevations were available with 1-foot contours from detailed topographic mapping obtained by PEF. Existing and future water levels were predicted using the computer model and then compared to see how the LNP project would affect offsite flood conditions. The evaluation included offsite lands up-hill (actually higher ground to the north and east – no hills here) and downhill (west) of the LNP project. As noted in Paragraph 13.B, the project cannot cause offsite impacts, but if water stages onsite, then that is allowable (refer to Paragraph 13.A). This kind of evaluation could only be done with detailed computer simulation, which was completed in February 2010. This detailed evaluation was required in the COC to address local requirements.

20. The topographic mapping indicates that drainage within the modeled area generally flows from the northeast to the southwest toward existing culverts under U.S. Highway 19 (US 19) and County Road 40 (CR 40). The model predicts that some land uphill of the LNP powerblock and haul road (that is, east and north of the property) will experience a backing up of water levels during the 100-year flood event between the pre- and post-project conditions; however, all increases in the flood levels remain onsite. The ground slopes enough uphill of the new facilities such that all increases in flood elevations remain on PEF-owned property. The evaluation indicated some downhill (that is, west and south of the property) offsite sub-basins as having either a slight reduction or a slight increase to flood stages (rise of 1 inch or less). This change occurred because the new facilities will create slight changes in the timing of the peak storm, as well as the way the numerical model estimates water levels given the input data. I do not consider that these downstream changes would be detectable. They are not significant because they do not exceed the acceptable tolerance in the variation in modeling results considering the accuracy of the modeling approach and the accuracy of the topographic data. There

will be no need to mitigate impacts to the floodplain by extra excavation to offset the change in water levels because there are no offsite impacts.

21. The LNP project's effect on stormwater storage onsite, both in the floodplain and historic basin storage, were evaluated together by using the detailed dynamic modeling that takes the existing and proposed ground contours into account. For stormwater evaluations, detention is temporary storage that occurs when water is staged up in a pond or wetland and is slowed down by a restriction like a pond outlet, culvert, or just a narrow spot in the flow way. Retention is when water fills up a low spot and cannot leave except by percolation, including water that may percolate during the storm while flow is occurring too. Floodplain storage is considered to be the detention volume above the elevation where stormwater runoff occurs by sheet flow from natural low areas. The detailed computer simulations include this temporary detention volume when we compare the total flood elevation between pre- and post-project conditions. As described in Paragraph 20, stormwater backs up behind the raised powerblock and haul road, which replaces detention volume that may be lost from within the project footprint. Since this backup remains onsite, there is no offsite impact from loss of detention storage.

22. Historic basin storage is the available retention volume below this discharge elevation. The historic basin storage volume remains onsite and percolates to recharge the near-surface aquifer system after the storm is complete and overland flow ceases. The SWFWMD requires that lost historic basin storage be replaced so that groundwater recharge opportunities are maintained with site development. There are three wet ponds proposed, covering approximately 105 acres (ER 4.1.1.1.2.1). The average depth of a wet pond's permanent pool will be about 6 feet or more, so this generates approximately 630 acre-feet or more of compensating storage. The results of the Bounding Analysis estimated the potential loss of historic storage at 88 acre-feet. Because the wet ponds provide much more than 88 acre-feet storage, the wet ponds more than compensate for the historic storage loss. The proposed LNP project will not decrease the amount of stormwater reaching the near-surface groundwater under

the site because of this detailed analysis. If anything, the project increases recharge capacity of the site. Furthermore, soil removal for floodplain mitigation purposes is not required.

23. The stormwater ponds will be a source of recharge for the near-surface aquifer rather than a source of indirect dewatering because the average annual lake evaporation near the LNP project is about 46 to 50 inches per year, and the annual precipitation is about 53 inches per year. These values are based on the long-term averages available from the National Oceanic Atmospheric Administration (NOAA). Direct precipitation on the ponds will offset evaporation over a long-term average by 3 to 7 inches. Since the wet ponds occupy approximately 105 acres, 5 inches of excess rainfall (precipitation minus evaporation, mid-point of the above range) would provide an additional 43.8 acre-feet of water per year over these ponds, which will be available for percolation or runoff. Therefore, I expect the series of stormwater ditches that direct stormwater from the LNP facilities, as required to meet applicable safety General Design Criteria, to the three stormwater ponds will be a source of recharge to the aquifer and cannot reasonably be foreseen to cause dewatering.

24. The LNP project proposed to pump stormwater out of the wet ponds to the cooling towers, if necessary, to achieve more storage in the event of successive large storms. An analysis of the potential effect of actively dewatering the wet ponds was conducted as part of the ERP (stormwater permit) application (see SCA Appendix 10.4, Attachment A.2 Ecological Report). A long-term water balance of the ponds and downstream wetlands was simulated assuming that the maximum amount of pumping occurs from the stormwater pond regardless of whether successive storms occurred or not. This is the most conservative assessment possible as it would remove the most water from the ponds. A range of assumptions was simulated to account for the possible variation in the actual percolation rates. The maximum reduction in offsite runoff by using the maximum pumping rates at every available opportunity was 0.2 inch per year. Pumping water out of the stormwater ponds will only occur during extended wet conditions to provide room in the wet ponds to capture more stormwater runoff. During periods of frequent rainfall the ground would be saturated and recharge would not be occurring, just runoff. In comparing recharge to the aquifer before and after the LNP is constructed,

the stormwater pumped to the cooling towers is not a significant factor because the amount of excess water in the wet ponds would likely be runoff prior to the construction of the ponds because of the saturated ground conditions. So pumping the ponds will not change the expected percolation. In practice, PEF will use the pumps only as needed during very wet periods, so there will be negligible reduction on the water balance around the LNP site from the occasional pumping of stormwater. In fact, because of the size of the wet ponds and elevation of the spillways, I expect percolation will increase after construction.

Proximity of Surface Waters and OFWs to LNP Project

25. For context in understanding the aquatic resources within the scope of Contention 4, I am providing comments on potential effects to waters of special concern. These comments explain the special regulatory meaning of certain surface waters. The LNP project does not have passive dewatering, as described previously, but I describe the regulatory status of wetlands, floodplains, special aquatic sites, and other waters in relation to the LNP project. There are no creeks, streams, ditches, or channels that lead offsite; therefore, only stormwater runoff by overland flow is pertinent to the discussion of surface water impacts from the LNP. Only a few surface waters are in proximity to the LNP project because stormwater runoff would not "jump over" a river or stream to reach other surface waters farther away. Also, as described in the DEIS (Section 2.3.1.2, pg 2-27, lines 16 through 20), there is a strong connection between the near-surface groundwater levels and the regional Upper Floridan aquifer in the area around the LNP site. The Floridan aquifer is flowing mostly west by southwest, directly to the Gulf or toward the lower Withlacoochee River or Lake Rousseau. Therefore, only the surface waters and groundwater levels in immediate proximity to the LNP site, and the waters further away to the north and east of the site, or south of Lake Rousseau are not relevant.

26. EPA identifies six categories of "special aquatic sites" in their Section 404 b.(I) guidelines (Federal Register 1980), including the following:

A. Sanctuaries and refuges

B. Wetlands

C. Mudflats

D. Vegetated shallows

E. Coral reefs

F. Riffle and pool complexes

27. Of EPA's categories of special waters listed in Paragraph 26, only wetlands are present at the inland LNP site; there are no lakes or streams. The property's ecology is a north Florida flatwood with mostly level landscape scattered with both hydrologically interconnected and isolated wetlands with slightly lower elevations than the surrounding woods. The LNP site landscape has been modified heavily from past silviculture activities. The wetlands on the LNP site are all freshwater wetlands.

28. The classification of surface waters by their designated use is delegated to states in the Clean Water Act, and surface water classifications are included in Section 62-302.400, F.A.C. There are five use classifications recognized in Florida: Class I (Potable Water Supply), Class II (Shellfish Propagation or Harvesting), Class III (Recreation, Fish, and Wildlife), Class IV (Agricultural Water Supply), and Class V (Navigation, Utility, and Industrial). There currently are no Class V designated waters in Florida. All surface waters not designated otherwise are considered Class III waters. All wetlands on the LNP site are Class III waters and, therefore, are not considered "special" aquatic sites under state surface water quality standards. That is to not to say that wetlands are not afforded regulatory considerations, but none of the wetlands on the LNP site have extraordinary regulatory status.

29. Florida has a category of surface waters called OFWs that do have special regulatory considerations. OFWs are defined explicitly in Section 62-302.700 F.A.C., Special Protection, Outstanding Florida Waters, Outstanding National Resource Waters. OFWs include waters located in state or national parks, refuges, recreational areas, and preserves, or are specifically designated as special waters. I developed a figure showing all of the OFWs and lands with OFWs that FDEP has published in a geographic information system (GIS) database in the vicinity of the LNP project (see Figure Griffin-1 included as Attachment 3). This figure is a combination of figures available in the DEIS, including

Figure 2-8 (shows three sub-basins) and Figure 2-17 (shows preserves). There are many shaded areas included in this new figure but many are state-owned lands that have a preservation function. For example, the Levy County Forest/sandhill polygon adjacent to the northeast section of the LNP site (also known as Goethe State Forest), means that any waters within its boundaries have OFW protection, not that the entire shaded area is water. The reason that I combined this information on one map is to be complete as an aide to readily show all OFWs in proximity of the LNP site. This map can be used as a reference for the following discussion.

30. The LNP site lies in two primary watersheds as defined by the FDEP: Wacassassa and Withlacoochee Rivers (ER Figure 2.3-4). However, most of the site drains into three smaller sub-basins, defined by FDEP as Spring Run Creek, Direct Runoff to Gulf, and Withlacoochee River (ER Figure 2.3-5, Figure Griffin-1, DEIS Figure 2-8). The Wacassassa River is north of the Spring Run Creek sub-basin so surface water from the LNP site will not reach that river, or any other OFW that may lie outside of these three drainage sub-basins. Surface water will not flow back to the east either, so the waters in Goethe State Forest will not be affected.

31. The only OFW in the vicinity of the LNP site is the lower Withlacoochee River, from the Gulf of Mexico to the Inglis Lock Bypass Channel but not including that isolated segment of the river between Lake Rousseau and the CFBC (the CFBC bifurcates the Withlacoochee River) (see DEIS Figures 2-6 and 2-9). The components of the CFBC project that have been redesignated by Florida as the Cross Florida Greenway Recreation and Conservation Area (including Lake Rousseau, CFBC, and the remnant of the Withlacoochee River below Inglis Dam) are not OFWs except for portions of the lands around Lake Rousseau that may lie in a state park. Only the lower Withlacoochee River downstream of the Bypass Channel is addressed further because the Withlacoochee River upstream and east of Lake Rousseau is not in proximity to the LNP site, and drainage from LNP flows mostly westward. The LNP site is approximately 3.4 miles from the lower Withlacoochee River, 3.0 miles from Lake Rousseau, and 7.9 miles from the Gulf of Mexico (Figure Griffin-1). Surface water derived from the northern portion of the LNP site is eventually intercepted by an offsite creek called

Spring Run Creek after stormwater flows through the flatwoods, into the US 19 drainage system, and then toward the Gulf of Mexico (Figure Griffin-1, DEIS Figure 2-8). The site portions draining to Spring Run lie north of the raised LNP powerblock. Little activity will be conducted in this sub-basin; portions will be used as material laydown and parking areas during construction and the permanent transmission switchyard. Spring Run Creek is a Class III waterbody and only some of the state preserve near the coast lies in this sub-basin. Because the preserve is in the salt marsh along the Gulf of Mexico, there will be little influence of freshwater on this area and the LNP site is located more than 7 miles away (about 7 miles in a straight line, but the flow path is much more winding and lengthy).

32. Portions of the LNP site, where the raised powerblock and stormwater ponds will be located, drain southwest into the US 19 drainage system and then directly to the Gulf of Mexico through a series of interconnected wetlands (Figure Griffin-1). There are no named streams or creeks in this sub-basin and there are preserves only in the salt marshes along the Gulf of Mexico.

33. A small portion of the LNP site lies in the lower Withlacoochee River basin (Figure Griffin-1). The portions of the site draining southward only contain the haul road and onsite pipeline and transmission line corridor (DEIS Figure 2-11). After a detailed review of the floodplain flow and detailed topography, I determined that the runoff from the southern LNP site drains south toward CR 40 and is intercepted by the Bypass Channel and does not directly flow to the lower Withlacoochee River. The Bypass Channel is a Class III waterbody but it does flow directly into the lower Withlacoochee River.

Effects to Offsite Surface Waters

34. Potential mechanisms by which active or passive dewatering could impact special aquatic sites or other waters is generally through a reduction of water levels or secondary effects caused by the lowering of the water table. I examined whether active dewatering by withdrawing water for the cooling tower makeup would affect water levels surrounding the intake. The intake is located in the CFBC that is connected directly to the Gulf of Mexico. Withdrawing makeup water does not lower

any water levels in the vicinity of the intake because withdrawal rate for LNP relative to the tidal flow in the canal is small (DEIS 5.2.3.1).

35. No passive dewatering will occur at the LNP site, but if passive dewatering were occurring it would not affect the volume of surface water reaching the lower Withlacoochee River because most of the LNP site to be developed with new buildings and facilities, drains directly toward the Gulf of Mexico and not into another named waterbody. Even though the LNP site is generally situated in the Waccasassa River watershed as defined by FDEP for area accounting purposes, no drainage in the "Direct Runoff to Gulf" sub-basin, where most development would occur, reaches the Waccasassa River. In addition, the LNP site is only a small portion of the entire sub-basin labeled as Direct Runoff to the Gulf in Figure Griffin-1 (also in DEIS Figure 2-8). The OFWs in this sub-basin are either preserves in the Gulf or in the adjacent salt marshes. The amount of freshwater flowing by overland flow toward the Gulf from the 3,105-acre (4.9-square-mile [mi^2]) LNP site is small in comparison to the amount of freshwater being introduced to the Gulf through the Withlacoochee River watershed (approximately 2,100 mi^2) and the Waccasassa River basin (approximately 936 mi^2). Freshwater flow from the LNP site is small because it is less than 0.2 percent in area of these other two river watersheds. See DEIS Figure 2-7 for a graphic depiction of the size of the two river's watersheds relative to the LNP site. DEIS Figure 2-8 is a close-up view of the three sub-basins where the LNP site lies that total 72 mi^2 (Spring Run sub-basin is 25.4 mi^2, Direct Runoff to the Gulf sub-basin is 33.1 mi^2, and the Withlacoochee River sub-basin is 13.5 mi^2). The 3,105-acre LNP site is less than 7 percent of these local drainage sub-basins.

36. The lower Withlacoochee River is the only flowing OFW waterbody in proximity to the LNP site that may be affected by changes in surface water discharges. The LNP project was carefully planned to make sure the lower Withlacoochee River was not affected, including using Gulf of Mexico water from the CFBC for cooling water. Pipelines to the CFBC intake will bridge over the Bypass Channel to avoid restricting any flow to the lower Withlacoochee River. The spillway located at the end of the Bypass Channel near the lower Withlacoochee River, controls the amount of surface water reaching

the river. The lake is maintained at a nearly constant water level by the State of Florida. Flow has nearly always passed through the Bypass spillway control structure to the lower Withlacoochee River to maintain a constant supply of water. The contributing watershed to Lake Rousseau is about 2,000 square miles, which provides baseflow during drought periods. The minimum annual 7-day low flow over the Bypass spillway during 40 years of record keeping was reported by the U.S. Geological Survey (USGS) to be about 56 mgd (86 cubic feet per second [cfs]), flow of at least 360 mgd (560 cfs) 90 percent of the time, and flow in excess of 653 mgd (1,010 cfs) more than half of the time (Attachment 4 presents the USGS Water-Data Report 2009 for Gauge 02313250 Withlacoochee River Bypass Channel near Dunnellon, FL, the most current data summary). By maintaining the lake at a nearly constant water level, Lake Rousseau provides a large source of water to keep the groundwater levels near the lower Withlacoochee River at nearly the same steady levels. Therefore, even if there were passive dewatering at LNP site, it would not have a noticeable effect on the flow to the lower Withlacoochee River because the contributing watershed is about 400 times larger than the LNP site, and groundwater levels near the river are controlled by the lake elevation.

37. The foregoing is complete and accurate in all material respects to the best of my knowledge and belief.

Mitchell L. Griffin, Ph.D., P.E.
Principal Technologist
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Gainesville, FL 32608
352-384-7078

Subscribed and sworn to before me this 17 day of August, 2010.

Dierdre T. Marsh Notary Public

DIERDRE T. MARSH
MY COMMISSION # DD811803
EXPIRES August 04, 2012
(407) 398-0153 FloridaNotaryService.com

My Commission expires: August 04, 2012

Mitchell L. Griffin

Water Resource Principal Technologist

Education

Ph.D., Agricultural Engineering, Purdue University, 1988
M.S., Agricultural Engineering, University of Kentucky, 1983
B.S., Civil Engineering, University of Kentucky, 1980

Professional Registrations

Professional Engineer: Florida (1989, No. 40772), Georgia (1999, No. 25672), Louisiana (2004, No. 31484)

Distinguishing Qualifications

- Nationally recognized expert on watershed pollution sources and control. Experience has included both urban (separate and combined sewers) and rural watersheds.
- Strong hydrologic and hydraulic technology background with extensive experience in evaluating water supply sources, flooding, and hydroperiods. Computer modeling expert with experience using a variety of hydraulic, hydrology, and watershed models.
- Successfully negotiates surface water discharge permits, including treated wastewater effluent, stormwater, bioassessments, toxicity identification evaluations, and water quality based limitations.

Relevant Experience

Dr. Griffin is a senior water resources engineer specializing in solving surface water drainage, supply, and quality problems. He assists municipal and industrial clients in making planning decisions and obtaining surface water permits, including National Pollutant Discharge Elimination System (NPDES) federal permits for point source discharges and storm water. He is skilled in computer modeling to solve water resources-related problems and is familiar with a wide range of computer model types including: hydraulics, hydrologic (watershed), mixing zones, water quality impacts, geographic information systems (GIS), systems analysis, and time series analysis. Dr. Griffin has more than 25 years of experience practicing engineering.

Recent Projects

Senior Technical Consultant; Site Certification Application, Florida, and Combined License Application, Federal, for Levy Nuclear Plant Units 1 and 2, Progress Energy. June 2006 through Present. Dr. Griffin provides senior consulting and expert testimony for the license applications for a green-field nuclear plant located in Levy County, Florida. He is the engineer of record for the NPDES permit application for the disposal of industrial wastewater from the power plant (Section 316(a) of the Clean Water Act). Dr. Griffin has also consulted on the various surface water aspects related to the permitting and planning of the site and associated facilities. These activities have included evaluating water balances, on-site wetland hydroperiod affects, reviewing storm water permitting issues, and providing intake (Section 316(b)) and discharge antidegradation demonstration support.

Senior Technical Consultant; Lower St. Johns River Reuse and Treatment Project, St. Johns River Water Management District. August 2006 through Present. The SJRWMD is facilitating meetings and reuse project cost sharing to assist local utilities and communities to comply with nutrient TMDLs and to reduce future consumptive use of groundwater. CH2M HILL is providing technical support in tracking nutrient loadings, costs, and flows. This project support included the development of a regional cost estimate to comply with the TMDL, utilizing District and CH2M HILL planning level cost procedures. An optimization simulation was completed on the average annual nitrogen loadings from municipal wastewater plants and nonpoint sources to determine least cost scenarios for complying with the TMDL, exceeding the TMDL, and to reduce a fixed percentage of discharge into the Lower St. Johns River.

Senior Technical Consultant; Tracking and Investigating Microbial Sources, Gainesville Regional Utilities (GRU), Gainesville, FL. July 2004 through April 2007. Several of the City of Gainesville's urban streams have proposed TMDL for fecal coliform. As part of a remediation program, GRU retained CH2M HILL and Biological Consulting Services to conduct an intensive bacteria source tracking (BST) project to identify the potential sources. This water quality sampling effort used pioneering technology to ribotype DNA, develop and test human markers such as *bacteriodes*, human enteric and polynoma viruses, and *enterococcus*. These tests identified multiple sources which makes addressing the issue more complex. Additional identification work is being focused on areas identified from this study.

Project Manager; St. Johns River Water Management District Project Management and Technical Support Services for Demineralization and Concentrate Management Studies; October 2005 through September 2008. The SJRWMD District Water Supply Plan addresses a number of water supply management strategies, and one of them is support for emerging potable water treatment technologies. Raw water treatment of brackish and saline waters using membrane technologies is one of the more promising of these options, but to date management of the resultant concentrate has been identified as one of the primary impediments to gaining necessary regulatory approvals for system installation and operation. CH2M HILL is providing project management support to help the District to evaluate the many factors that are involved in designing and permitting this kind of water supply alternative.

Project Manager; St. Johns River Water Management District Demineralization Concentrate Ocean Outfall Feasibility Study: Phase 2A – Conceptual Ocean Outfall Evaluation; October 2005 through July 2007. To better define the feasibility of ocean outfall disposal of concentrate, SJRWMD initiated investigations to help utilities understand relevant outfall implementation issues. The Phase 2A activities included preparation of planning-level conceptual engineering designs and dilution modeling for a range of outfall discharge scenarios that bracket the concentrate, outfall design, and oceanographic conditions that could likely be encountered in northeast and central Florida. On the basis of the synthesis of the modeling and engineering analysis results, it appears clear that ocean outfalls for demineralization concentrate should be feasible from the technical and regulatory perspectives.

Conference Co-Chair; TMDL 2005 and TMDL 2007, Water Environment Federation (WEF). Dr. Griffin has volunteered with WEF for a number of years related to their Nonpoint Sources technical committee. For three years, he served as the conference co-chair on WEF's specialty conference related to policy and technology issues for addressing TMDLs. Dr. Griffin has worked with other volunteers from across the nation to produce this popular biennial conference by reviewing abstracts and papers, organizing panels, and developing a program of speakers from EPA, states, and municipalities.

Project Manager; USDA Natural Resource Conservation Service Wetland Restoration Program Design Services; March 2005 through March 2010. The NRCS Wetland Restoration Program (WRP) involves making previously drained agricultural lands and restoring their hydrology to form natural wetlands. These projects involve deconstructing the previous drainage improvements and building new ones that retain water. CH2M HILL is performing design and permitting services to implement the WRP in Florida. CH2M HILL will complete 14 projects during the first four years, restoring over 8,100 acres of wetlands.

Project Manager; Miami-Dade County Stormwater Master Plan, Basins C-103 and C-2; November 2001 through March 2007. During Phase I of the Stormwater Master Plan (SMP) program (completed 1996), CH2M HILL used the C-9 East study area to establish the procedures that are used in the overall program. Dr. Griffin assisted in developing the data collection program during Phase I. For Phase II of the SMP, the following activities were completed:

- Watershed modeling to determine both flooding and water quality amounts
- Flood contour mapping
- Assess the flood and water quality level-of-service and prioritize sub-basins
- Development of proposed Control Measures for priority sub-basins
- Evaluation of Control Measures including cost, institutional and regulatory issues for both existing and future land uses
- Phase II Deliverables

CH2M HILL completed the SMP for the C-103, Florida City, and North Canal basins October 2003. These basins include parts of Homestead and the agricultural areas near the Everglades. CH2M HILL completed Phase II of the C-2 Basin master plan March 2007, which contains the highly urbanized Snapper Creek watershed (Kendall area). The total value of these two Phase II studies was $1.3 million dollars.

Lead Project Engineer; Louisiana Department of Natural Resources Mississippi River Water Reintroduction to Bayou Lafourche; December 2003 through December 2005. Federal and State plans to restore marshlands along Louisiana's coast depend on diverting large quantities of freshwater from the Mississippi River to affected areas. This project will use Bayou Lafourche's unique location to convey 1,000 cubic feet per second (cfs), or more, to 85,000 acres of marshes in the Terrebonne and Barataria Basins. CH2M HILL is designing up to five alternatives to the 30 Percent level for the Louisiana Department of Natural Resources. Dr. Griffin led an assessment of the historical water levels over the last 120 years in Bayou Lafourche. He also provided senior leadership for the hydraulic modeling (HEC-RAS) completed during the preliminary screening at the 10 Percent level and additional conveyance design for the 30 Percent level. Dr. Griffin also is providing senior review on the development of a two dimensional hydrodynamic model of the entire project area utilizing TABS (RMA-1, RMA-2, and RMA-11).

Senior Technical Consultant; City of Milton Level II Water Quality-based Effluent Limitation (WQBEL); March 2004 through December 2007. The City of Milton was required by the Florida Department of Environmental Protection (FDEP) to conduct a Level II WQBEL as a condition of their National Pollutant Discharge Elimination System (NPDES) permit. CH2M HILL is conducting this study in the Blackwater River near the City. A Level II WQBEL requires that a plan of study be developed and approved by FDEP, sampling, and receiving water modeling. Dr. Griffin will lead the water quality modeling portion of the project.

Lead Water Resource Engineer; Pinellas County Water Management Study for the Bridgeway Acres Solid Waste Management Facility; October 2004 through May 2005. As part of an overall assessment of the water supply, management, and treatment, Dr. Griffin prepared an assessment of the surface water facilities of Pinellas County's Bridgeway Acres landfill site. A main component of the analysis was an assessment of the water supply potential of an on-site pond. A yield study of the reservoir and the supply benefits of deepening it were examined. This assessment was used by the County to prepare a list of capital improvement projects for the site.

Project Manager; George B. Wittmer and Associates Nassau County Agricycle Facility Permitting; February 2005 through November 2006. George B. Wittmer and Associates specializes in reclaiming material for reuse projects. The Nassau Agricycle Facility creates soil products (potting soil) and amendments by processing yard and pulp mill wastes. CH2M HILL was contracted to support permitting for both the Environmental Resource Permit (stormwater) and the Solid Waste Permit from the Florida Department of Environmental Protection (FDEP). This work included designing a new stormwater system, evaluating subsurface clay conditions, and providing supporting information to FDEP.

Project Manager; Tampa Bay Water Hillsborough River/Tampa Bypass Canal Hydrodynamic and Flow Forecasting Models Evaluation; June 2002 through October 2003. Dr. Griffin managed a watershed modeling project for Tampa Bay Water. The purpose of this project was to predict flows and stages at specific locations in the surface water supply system 7 days into the future so Tampa Bay Water can plan on water withdrawals and general operations of the flow control structures. Upstream flows were predicted using Analytical Neural Network (ANN) stochastic models. A one-dimensional HEC-RAS model was developed for the lower Hillsborough River and Tampa Bypass Canal watersheds. The results of these models were then integrated into a flow prediction tool using an Excel spreadsheet to assist the utility to predict surface water withdrawals. Dr. Griffin also led a long-term supply forecasting modeling effort for Tampa Bay Water to use with their demand forecasts. Monthly surface water supply was forecasted for 25-years into the future using stochastic time series models.

Lead Project Engineer; City of Atlanta CSO Remedial Measures Plan; June 1999 through April 2001. The City of Atlanta's combined sewer service area is about 19 square miles, and is centered about its downtown commercial district. Dr. Griffin was the lead project engineer to develop a long-term control plan for the City to meet a federal consent decree. He led the generation of a combined sewer system evaluation report that analyzed and documented a 15-month field study of water quality of the sanitary, storm water, and combined sewage. There was a strict deadline imposed on the study by the EPA and state regulatory agency to finish this report, which consisted of approximately 3,500 pages (6 Volumes). Dr. Griffin was also the task leader to develop an analysis of long-term control plan (LTCP) to reduce the pollutants and to bring the combined sewer overflows (CSO) into compliance with water quality standards. This project had an extensive public involvement component that required coordination of information and public presentations about the program. The preferred alternative consisted of approximately $1 billion dollars of capital improvements in the combined sewer service area, and included new sewers, storage, and treatment of the CSO.

Watershed Planning Projects

See Tampa Bay Water and Louisiana Department of Natural Resources project descriptions under *Recent Projects*.

Dr. Griffin quantified planning-level estimates of nonpoint sources of pollution into the Great Swamp National Wildlife Refuge (New Jersey). CH2M HILL assisted a local planning committee to address their management and data needs to protect this valuable national resource. During this project, Dr. Griffin presented results to the planning commission and offered recommendations for further research and data collection. The commission used CH2M HILL's report to develop a regulatory strategy for managing the watershed.

Dr. Griffin assisted in formulating a watershed protection plan for Mecklenburg County, North Carolina. He analyzed the hydrologic regime and coordinated the development of a GIS database for Mountain Island Lake, the county's only drinking water source. Using this database, Dr. Griffin formulated a methodology to determine nonpoint source pollution loadings to the reservoir. The County has established a tough non-degradation policy for its reservoir and CH2M HILL assisted in characterizing the existing water quality, evaluating potential future impacts, and in formulating regulations for implementing a watershed protection plan.

In the area of storm water master planning, Dr. Griffin assisted the City of Gainesville, Florida, in formulating watershed flood control alternatives. He assisted the Miami-Dade County Department of Environmental Resources Management (DERM) in developing guidelines for collecting stormwater data for their master planning program. He managed the development of stormwater master plans for two basins in Miami-Dade County. For certain priority watersheds in Franklin County, Florida, Dr. Griffin examined the local flooding problems and potential water quality loadings into Apalachicola Bay and recommended both flood control and water quality improvements. Dr. Griffin assisted the City of Atlantic Beach, Florida, to meet its master planning requirements, refine its storm water utility data base, and obtain its storm water NPDES permit application. Dr. Griffin also led the development of detailed master plans for two watersheds in Leesburg, Florida, and a Phase I plan for the City of North Miami.

In the area of drainage planning, Dr. Griffin drafted the drainage sub-elements of the comprehensive plans that CH2M HILL prepared for the cities of Deerfield Beach and Boynton Beach, Florida. He evaluated the potential effects of proposed drainage facilities on spray irrigation effluent disposal fields owned by a large, Florida-based development company. Also, he provided a technical review of a flood insurance study the U.S. Army Corps of Engineers conducted on Fourche Creek in Little Rock, Arkansas. Dr. Griffin also has prepared Letter of Map Revision applications for the FEMA flood insurance program for the City of Gainesville.

Dr. Griffin has designed stormwater facilities for industrial and water plants sites, and municipal drainage facilities for neighborhoods. In Fort Lauderdale, Florida, Dr. Griffin designed French drains (infiltration systems) for nearly 9,500 linear feet of commercial neighborhoods. In another residential neighborhood, French drains and grit chambers were designed. For the City of Miami Beach, Dr. Griffin performed senior review of preliminary design for new facilities in the South Beach area.

Dr. Griffin was the lead senior reviewer during the design of four stormwater pump stations for the City of Key West. These pump stations were used to pressurize drainage wells used to eliminate stormwater discharges to nearby ocean waters. The pump stations included pretreatment with vortex-type units and ranged in size from 2,500 to 5,000 gallons per minute (gpm).

Under CH2M HILL's contract with the Virgin Islands Port Authority, Dr. Griffin developed sediment control plans for proposed marinas in St. Thomas and St. John. These plans were designed to protect the marinas and off-shore grass beds from the effects of sediment deposition resulting from upland erosion.

To control nutrient runoff from eight dairy farms in the Lake Okeechobee basin in South Florida, Dr. Griffin designed intensive waste management facilities. The project involved coordination with the dairy owners and the South Florida Water Management District to ensure that best management practices could be incorporated into the farmers' operations and still meet Florida's Dairy Rule requirements.

NPDES and Water Quality Related Permitting

See GRU and City of Milton project descriptions under *Recent Projects*.

Dr. Griffin has assisted clients such as Jacksonville, Lakeland Electric, Pace, Key West, Gasparilla Island Water Association, Cooper City, Chevron Terminal, and a Tropicana processing facility in the Tampa Bay area evaluate dilution and water quality effects from their outfalls. These effects must consider the water quality and antidegradation implications to satisfy Florida rules and obtain permits. Several of these projects also involved predicting mixing zones and plume dilution using computer models. Dr. Griffin also modeled the mixing zone for the Arecibo regional wastewater plant in Puerto Rico. The concentrate from membrane treatment also requires similar evaluations. Dr. Griffin has assisted Palm Coast and Gasparilla Island obtain permits for brine discharge too.

Dr. Griffin assisted United Water Florida (UWFL), a private utility company in Jacksonville, Florida, to address a variety of permitting issues. CH2M HILL has been providing environmental permitting assistance for this utility for about 20 years. Projects Dr. Griffin completed or managed for the utility include:

- Yulee Service Area
    - Develop conceptual disposal plan for effluent management. This plan was used to select and locate a new regional wastewater treatment facility (WWTF). The recommended alternative was a wetland disposal system.
    - Conducted wetland sampling and prepared permit documentation for the baseline monitoring requirements of the wetland disposal system.
    - Conducted receiving water sampling and prepared permit documentation to address water quality and antidegradation issues for effluent disposal system.
    - Prepared the application and obtained an NPDES disposal permit for the regional WWTF.

  - Provided environmental and geotechnical services to support UWFL's purchase of the wetland and WWTF site.

- Jacksonville Heights WWTF
  - Conducted receiving water sampling and generated a Level I water quality based effluent limit report for a permit renewal.
  - Conducted a detailed toxicity identification evaluation of the effluent. Continuing professional engineering support is being provided to address an Administrative Order on this facility.
  - Conducted in-stream sampling, benthic monitoring, and bioassay testing of the receiving water.
- Royal Lakes WWTF
  - Developed an antidegradation analysis for a new direct discharge outfall into the St. Johns River to replace wetland discharge.
  - Monitored the St. Johns River for discharge permit compliance.
- San Jose WWTF
  - Assisted permit renewal by studying the mixing characteristics of the outfall.
- Monterey WWTF
  - Performed the antidegradation analysis for the permit renewal documentation.
- Ponte Vedra WWTF
  - Conducted an assessment of the treatment performance of the WWTF, including the existing percolation system used for effluent disposal.
  - Developed a Capacity Analysis Report for permit application.
  - Developed an Operations and Maintenance Report for permit application.
- Ortega Hills WWTF
  - Prepared a permit renewal application.
- Holly Oaks WWTF
  - Conducted a limited toxicity identification evaluation.
- Sunray Utilities
  - Reviewed the condition and permit history of water and wastewater treatment facilities in St. Johns and Nassau Counties in support of UWFL purchase of a utility company.

- Blacks Ford Regional WWTF
  - Develop conceptual disposal plan for effluent management. This plan was used to select and locate a new regional WWTF. The recommended alternative was a wetland disposal system.
  - Conducted wetland sampling and prepared permit documentation for the baseline monitoring requirements of the wetland disposal system.
  - Conducted receiving water sampling and prepared permit documentation to address water quality and antidegradation issues for effluent disposal system.
  - Prepared application for an NPDES disposal permit for the regional WWTF.
  - Provided environmental and geotechnical services to support UWFL's purchase of wetland and WWTF site.
  - Conducting operation monitoring of the wetland after the WWTF was constructed.
- Permit Tracking Software
  - Developed an ACCESS database application that can assist UWF track scheduled permit conditions.

Dr. Griffin has assisted the City of Jacksonville to address antidegradation permitting requirements for wastewater plants. The Arlington East regional facility discharges directly into the St. Johns River. The anti-degradation study evaluated water quality effects, natural systems effects, potential for reuse, and other public interests of the project. As an outgrowth of this project, Dr. Griffin assisted the City respond to regulators requests for information at their other wastewater treatment plants concerning the effect of nutrients on the St. Johns River near the outfalls. He has also prepared mixing zone applications for Arlington East, Buckman, Southwest, and District II water reclamation facilities for selected metals.

Dr. Griffin assisted a pulp mill in North Florida conduct an investigation on possible mercury contamination in the surrounding environment. This investigation examined surface and ground waters, sediments, and bio-accumulation. The plan of study, which was negotiated with the state regulatory agency, stipulated a phased approach that conducted a screening-level investigation, followed by an intensive remediation study if mercury in alarming levels are found. Ultra-clean laboratory measurements were used as quality assurance controls on some of the samples. Levels found within the sediments were not significantly higher than other background stations.

Dr. Griffin managed a Level II Water Quality-Based Effluent Limitation (WQBEL) study for the New Township of Poinciana, Florida. This wasteload allocation project differed from traditional studies because the water quality within the water body as a result of loadings from both point and nonpoint sources must be determined to establish the point source discharge limitations. This study involved negotiating a detailed plan of study with the state regulatory agency, collecting field water quality data, and computer modeling of dissolved oxygen dynamics in a canal and of nonpoint sources of nutrient loadings and their impact on Lake Hatchineha. Dr.

Griffin has also conducted WQBEL analyses for Orange County Utilities Department for discharge of diluted leachate from its landfill stormwater ponds.

Dr. Griffin assisted several clients in obtaining NPDES storm water permits. For the City of Jacksonville, he provided technical quality control guidance and reviewed the preparation the City's municipal permit application. Dr. Griffin had primary responsibility in designing the storm water sampling program and estimating pollutant loadings for the more than 500 outfalls in the City. Other permit applications were prepared for the Department of Transportation, City of Neptune Beach, and City of Atlantic Beach. For Atlantic Beach, Dr. Griffin was the project leader. He also prepared a group application for several wastewater treatment plants in the Jacksonville area.

Dr. Griffin has also assisted clients in operating their stormwater systems after being permitted by EPA's stormwater NPDES permits. Dr. Griffin led the dry weather sampling effort by the City of Miami to collect water quality samples at priority outfalls within the City. Sediment and benthic samples were collected along Wagner Creek for permit compliance. Final reports were developed for the City to use as part of their annual compliance report. Dr. Griffin has assisted industrial clients prepare stormwater pollution prevention plans for their NPDES stormwater permit compliance also.

Combined Sewer Overflow

See City of Atlanta project description under *Recent Projects*.

During CH2M HILL's development of a facility plan to reduce combined sewer overflows (CSO) into Boston Harbor, Dr. Griffin developed a FORTRAN computer model to simulate the performance of large-scale storage facilities (deep tunnels). This program was used to evaluate all deep tunnel alternatives and included optimizing the size of the secondary treatment facility to economically treat wet-weather flows.

For the City of Bangor, Maine, Dr. Griffin provided senior consulting to develop the computer model used to simulate their combined sewer system. Dr. Griffin wrote a program to determine rainfall-derived inflow and infiltration (RDII) component of combined sewage. This final model combined custom programming and elements of the SWMM computer model to more accurately represent inflow and infiltration into the collection system. The final model was used to evaluate the magnitude CSO discharges and the effectiveness of alternative controls.

Technical Society Related

Dr. Griffin was the principal investigator of the Water Pollution Control Federation Research Foundation, now called Water Environment Research Foundation (WERF), critical assessment of the literature pertaining to nonpoint source pollution impacts. The newly formed research foundation sponsored assessments of literature to determine research needs in specific technical areas. With the advent of water quality-based effluent limitations, the impacts of nonpoint sources of pollution on water bodies will become an increasingly important topic for members of WERF. Dr. Griffin managed this project which developed a state of the art assessment and led a public workshop to develop projects for WERF. These projects were used by WERF to establish its first five-year research agenda.

Dr. Griffin led a two-day seminar sponsored by the American Society of Civil Engineers (ASCE) about municipal NPDES storm water permits. This seminar discussed regulatory requirements, management strategies to develop the permit application, best management practices and their effectiveness, and an overview of industrial permit requirements. The seminar was attended by 40 participants and had guest speakers from EPA and a municipality.

Dr. Griffin compiled a technical comment report on the Upper Raba River Watershed Management Plan in Poland. The Upper Raba River watershed feeds the Dobczyce Reservoir that is a primary source of drinking water for Krakow. Currently, there is serious concern over improperly treated wastewater discharges and eutrophication from nonpoint sources of runoff, which is causing rapid aging of this relatively new reservoir. The Water Environment Federation (WEF) was funded through the U.S. EPA to provide technical assistance to Eastern Europe and WEF consequently relied on its members' expertise to provide comments. Dr. Griffin participated and then synthesized these comments into an organized report.

Experience Prior to CH2M HILL

Dr. Griffin's doctoral studies focused on a computer-aided design procedure to determine precipitation data enabling the simulation of average annual erosion estimates from small landscapes. He was a principal researcher on a USDA-funded project that evaluated interactions among erosion, crop productivity, economics, and spatial variability. Dr. Griffin worked extensively with the ANSWERS and CREAMS models.

Dr. Griffin worked as a project water resource engineering consultant in Texas evaluating water supply primarily. He determined the operating characteristics of over 16 reservoirs in a single watershed comprising more than 2,000 square miles, evaluated critical water supply reserves for several municipalities in western Texas, monitored water supply reserves of Tarrant County, simulated water quality of Lake Ray Hubbard in Dallas, plus other various assignments.

Dr. Griffin has conducted tracer tests to determine flow rates and residence time analyses (using reactor theory models). For his M.S. thesis, he conducted a significant amount of dye testing to determine the hydraulic flow and residence time in model sediment ponds. These results were utilized in the formulation of the University of Kentucky's SEDIMOT computer program that analyses the performance of settling ponds. As part of his permitting support described under CH2M HILL experience, he has conducted tracer studies for water quality evaluations (Poinciana and Ponte Vedra). He also has utilized dye tracers to evaluate sewer systems during the development of storm water permits.

Professional Organizations/Affiliations

Water Environment Federation

- Nonpoint source committee past vice-chair then chair (2001 through 2004)
- Co-Chair of TMDL 2005 and TMDL 2007, National Specialty Conference

National Society of Professional Engineers

Florida Engineering Society

- North Central Chapter President, 2001, Treasurer 2006 to present.
- Mathcounts North Central Chapter Chairman, 1998 to 2007.

Mitchell L. Griffin

Publications and Presentations

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Supplemental Information

Years Experience Prior to CH2M HILL: 8 years
CH2M HILL Hire Date: August 1988

Employment History

1988 to present	CH2M HILL, Water Resource Engineer. Senior engineer dealing with a variety of surface water issues for the firm's clients. See the relevant project experience section.
1984 to 1988	Purdue University, Graduate Research Instructor. Conducted research related to soil and water conservation modeling in rural areas. The USDA Soil Erosion Research Laboratory sponsored this work.
1983 to 1984	Freese and Nichols, Inc., Water Resource Engineer. Staff consulting engineer dealing primarily with water supply and other water resources projects.
1980 to 1983	University of Kentucky, Agricultural Engineer. Conducted research related to predicting sediment pond performance for the removal of solids from stormwater runoff.