United States of America
Nuclear Regulatory Commission

Atomic Safety and Licensing Board

Before Administrative Judges:

Alex S. Karlin, Chair
Dr. Anthony J. Baratta
Dr. William M. Murphy

In the Matter of: PROGRESS ENERGY FLORIDA, INC. Combined License Application for Levy County Units 1 & 2	Dockets Numbers 52-029-COL and 52-030-COL November 15, 2010

AN AMENDED CONTENTION 4

The Following Attachments are Filed in Support of this Amendment to Contention 4

1 – Contention 4 as admitted by the ASLB, July 8, 2009.
2 – November 15, 2010 Affidavit of Dr. Sydney Bacchus (with exhibits B-1 – B-)
3 – Levy Nuclear Power Plant Units 1 & 2 PA08-51B CONDITIONS OF CERTIFICATION, Modified February 23, 2010
4 – Email from Paul Williams of SWFWMD re: minimum flow levels
5 – Email from Paul Williams of SWFWMD re: GWBRAI for Levy County
6 -- Levy County Comprehensive Plan
7 – USACE Sink Hole Map
8 – reserved
9 – Levy FSAR figs. 2.5.4.5-201A, B
10 – Affidavit of Dr. Griffin
11 – Affidavit of Dr. Howroyd
12 -- Staff Salt Drift Affidavit
13 -- Aerial Photographic Monitoring Final Report from 1994
14 – RAI answer from PEF
15 – Affidavit of Dr. Sydney Bacchus, February 6, 2009

I. AMENDED CONTENTION 4:

The Draft Environmental Impact Statement (DEIS) and its reliance upon State of Florida Department of Environmental Protection Conditions of Certification (COC, Conditions, also FDEP 2010) to inform the NRC licensing action for Progress Energy Florida's (PEF's) proposed Levy County Units 1 and 2 fails to comply with 10 C.F.R. Part 51 and the National Environmental Policy Act because it fails to specifically and adequately address, and inappropriately characterizes as SMALL, certain direct, indirect, and

cumulative impacts, onsite and offsite, of constructing and operating the proposed LNP facility:

A. Impacts to wetlands, floodplains, special aquatic sites, and other waters, associated with dewatering, specifically:

1. Impacts resulting from active and passive dewatering;
2. Impacts resulting from the connection of the site to the underlying Floridan aquifer system;
3. Impacts on Outstanding Florida Waters such as the Withlacoochee and Waccasassa Rivers;
4. Impacts on water quality and the aquatic environment due to alterations and increases in nutrient concentrations caused by the removal of water; and
5. Impacts on water quality and the aquatic environment due to increased nutrients resulting from destructive wildfires resulting from dewatering.

B. Impacts to wetlands, floodplains, special aquatic sites, and other waters, associated with salt drift and salt deposition resulting from cooling towers (that use salt water) being situated in an inland, freshwater wetland area of the LNP site.

C. As a result of the omissions and inadequacies described above, the Draft Environmental Impact Statement also failed to adequately identify, and inappropriately characterizes as SMALL, the proposed project's zone of:
1. Environmental impacts,
2. Impact on Federally listed species,
3. Irreversible and irretrievable environmental impacts, and
4. Appropriate mitigation measures.

Contention-4 (C-4) remains much as it was published when admitted in Attachment A of LBP-09-10 issued on July 8, 2009. It is here amended to reflect the publication of the Draft Environmental Impact Statement (DEIS) published by NRC Staff as NUREG 1942. The US Nuclear Regulatory Commission (NRC) has statutory authority to implement the National Environmental Policy Act (NEPA) to inform the Major Federal Action of granting, or denying the licenses for two AP1000 reactors proposed for Levy County Florida. In addition to NEPA, NRC has statutory authority and responsibility to meet all other applicable federal laws, including the Clean Air and Clean Water Acts.

II. Inappropriate Reliance on State of Florida Department of Environmental Protection Conditions of Certification (COC)

NRC Staff has adopted a strategy for sidestepping its obligation under the National Environmental Policy Act (NEPA) to engage with the points of concern identified by C-4 as admitted. Interveners and their expert, Dr Sydney Bacchus do not accept that the amended Conditions of Certification (FL Conditions) from the State of Florida Department of Environmental Protection (FDEP), instituted at the request of the Southwest Florida Water Management District (SWFWMD) (Attachment C), resolve the concerns that direct, indirect and cumulative hydro ecological impacts of the construction and operation of Levy Units 1 and 2 will be LARGE. NRC Staff sidesteps the obligation to fairly and accurately determine the direct, indirect and cumulative effects of the LNP project. Throughout the DEIS we find numerous examples (for instance: DEIS 2-122, 4-15, 4-26, 4-23, 4-35, 5-5) where NRC Staff invokes the FL Conditions as the substantiation that environmental harm will not occur or proof that impacts will be SMALL, for example:

> "PEF has committed to minimizing the effects on human populations, waterbodies and wetlands, archaeological and historic sites, vegetation, and wildlife to the extent practicable by complying with State and Federal regulatory requirements, including the specific conditions outlined in the Conditions of Certification…"(DEIS p.4-15)

While it is, of course, appropriate for PEF to comply with other regulatory requirements, and for NRC Staff to affirm this, NRC staff relies upon PEF compliance with the Conditions of Certification instead of making its own determination that the dewatering impacts of construction would be SMALL:

> Based on the information provided by PEF and the review team's independent evaluation, the 16 review team concludes that the water-use impacts of construction and preconstruction activities would be SMALL, and mitigation beyond the State of Florida's Conditions of Certification (FDEP 2010a) would not be warranted. Based on the preceding analysis and because NRC-authorized construction activities represent only a portion of the analyzed activities, the NRC staff concludes that the impacts of NRC-authorized construction activities would be SMALL. The NRC staff also concludes that mitigation beyond the FDEP conditions of certification would not be warranted. (DEIS p 4-24, lines 15 – 22)

Similarly, the NRC Staff's conclusion on cumulative impact on groundwater in 7.2.1.2:

> As described in Section 5.2, the review team concludes that the impacts of operations on groundwater use would also be SMALL, and no further mitigation would be warranted beyond the conditions imposed by the State of Florida Conditions of Certification. (DEIS 7-13 lines 20 – 22).

And with respect to impact on other future water development in the area:

> The SWFWMD has determined that the groundwater use at the proposed LNP site would be limited and would not significantly affect future planning in the region (FDEP 2010a) (DEIS p. 7-14, line 28)

Perhaps the most perplexing is the section on Operational Impacts with the subsection 5.2.1 on Hydrologic Alterations (DEIS pg 5-5) (emphasis in bold):

> As discussed in Section 2.3.1.2, because the original groundwater model developed as a requirement of the Florida Site Certification Application under-predicted hydraulic heads in the vicinity of the LNP site, the staff requested that PEF recalibrate the model using both site specific and regional head data. This recalibrated model resulted in predictions of increased drawdown and demonstrated that uncertainty in hydraulic property values in the vicinity of the proposed LNP wellfield can significantly influence assessment of wetlands impacts. **Results from these predictive simulations using the recalibrated model indicate that annual average LNP groundwater usage from the Upper Floridan aquifer will, after 60 years of operation, result in surficial aquifer drawdowns of as much as 2 ft in areas where wetlands are present. In addition, the lateral extent of the 0.5-ft drawdown contour extends up to 3 mi from the pumping well locations (Figure 5-1).** The predicted maximum drawdown affecting wetlands (less than 2.5 ft) is less than 31 percent of the normal seasonal variability (as much as 8 ft) observed in groundwater levels in the vicinity of the LNP site (see discussion of potentiometric surfaces in Section 2.3.1.2).
>
> The FDEP conditions of certification require PEF to develop an environmental monitoring plan, which includes a hydraulic testing program during drilling and installation of the proposed water supply wells to obtain site-specific hydraulic property estimates and determine whether the wellfield can meet groundwater-usage requirements without significantly affecting water levels in the surficial aquifer. **The conditions of certification require that during operation of the LNP wellfield, PEF must limit drawdowns in the surficial aquifer to levels that ensure no adverse impacts on wetlands.** (Emphasis added)

This passage of the DEIS is deeply perplexing. First NRC Staff reports that an analysis, which continues to be un-reviewed by any independent authority has shown what may be considerable impact. A drawdown of two feet which is not fluctuating due to natural variation in water flows but instead an additive and cumulative impact of the operation of Levy Units 1 & 2 is sufficient to stop spring flow. The fact that impacts are projected out to a three mile radius

confirms that the boundaries of the site are irrelevant to groundwater impact. The fact that Staff simply asserts that the Conditions of Certification will “ensure no adverse impacts on wetlands” sidesteps the question of spring flow and also provides no basis whatsoever for the assertion.

Dr. Bacchus provides an extensive critique of the short falls that the Conditions of Certification in her sworn affidavit of November 15, 2010 (Attachment 3). The primary problem in terms of satisfying Contention 4 is that the NRC Staff have not reviewed the environmental monitoring plan upon which so many of its determinations are based. This is because the environmental monitoring plan does not exist. Indeed, the State of Florida does not require the Plan to exist until three years prior to a well withdrawal rate averaging 100,000 gallons per day (See page 3 of 20 of Attachment 3). Further, the plan need not be implemented until one year before such water withdrawals (average) will be attained. The construction impacts of this project could be committed prior to the development, much less the implementation of these plans. In the interim the public, the interveners, our members and our expert are unable to review plans which do not exist.

NRC Staff reasoning satisfies neither the requirements of NEPA nor legal precedence. In *Calvert Cliffs' Coord. Com. v. United States A. E. Com'n, 449 F.2d 1109 (D.C. Cir., 1971),* one of the very first NEPA cases, regarding NEPA requirements, the court ruled:

> Certification by another agency that its own environmental standards are satisfied involves an entirely different kind of judgment. Such agencies, without overall responsibility for the particular federal action in question, attend only to one aspect of the problem: the magnitude of certain environmental costs. They simply determine whether those costs exceed an allowable amount. Their certification does not mean that they found no environmental damage whatever. In fact, there may be significant environmental damage (e. g., water pollution), but not quite enough to violate applicable (e. g., water quality) standards. Certifying agencies do not attempt to weigh that damage against the opposing benefits. Thus the balancing analysis remains to be done. It may be that the environmental costs, though passing prescribed standards, are nonetheless great enough to outweigh the particular economic and technical benefits involved in the planned action. The only agency in a position to make such a judgment is the agency with overall responsibility for the proposed federal action — the agency to which NEPA is specifically directed.

As this case reminds us, the licensing of Levy County Units 1 & 2 is a major federal action and it is the NRC that has the responsibility to fully engage with the matters of Contention 4 in the context of the proposal by PEF. NRC staff punts to the Florida Conditions of Certification which at this point in time provide absolutely no assurance whatsoever on many of the matters of C-4 since the key "Environmental Monitoring Plan" (EMP) required by the Conditions does not yet exist, may not for some time and much of the data required for such a plan to be credible also does not yet exist (Attachment 4).

> NRC Staff acknowledge at other points that there may be impacts such as:
>
> > Building-related groundwater withdrawals from the Upper Floridan aquifer, although unlikely, have the potential to decrease water levels at the site and induce lateral saltwater intrusion from the CFBC and vertical migration of saline waters from deeper Floridan aquifer intervals. The impacts on groundwater quality during building activities are bounded by the impacts during operation of the LNP Units 1 and 2, as discussed in Section 5.2.3.2, because operational groundwater usage is greater than that during building activities. Therefore, the review team concludes that groundwater-quality impacts during building activities would be minor, and mitigation beyond the conditions of certification would not be warranted. (DEIS 4-26)

Decreased water levels in such a water-dependent ecosystem are not a "small" impact. Lateral saltwater intrusion into the aquifer is not a "small" impact. The Environmental Monitoring Plan (EMP) does not yet exist and so it is improper for the DEIS to rely on it when there can be no informed analysis to determine whether the plan is sufficient. It is impossible for the public to comment on a fictional EMP. It is impossible for Staff to take "a hard look at the EMP. Also, since minimum aquifer levels for the Levy County have not been established, there can be no way to ascertain whether or not the wells are impacting the wetlands.

It is not appropriate that Staff rely on another agency's hypothetical plans when the DEIS is tasked to take a "hard look" at the environmental impacts. One cannot take a "hard look" at something that does not exist! Another example:

> Listed species that use wetland habitats on the LNP site could be affected by hydrological impacts on wetlands caused by groundwater withdrawal. Although the extent of potential impacts is uncertain, monitoring to identify adverse environmental impacts caused by groundwater withdrawal is stipulated under the State-imposed conditions of certification (FDEP 2010). PEF would be required to mitigate the adverse

> impacts or implement an approved alternative water-supply project that would not impact wetlands (FDEP 2010). (DEIS p.5-37)

The DEIS admits the consequences of groundwater withdrawal on animals, including endangered species, are unknown and claim that a non-existent EMP will identify any problems. Monitoring does not preclude disastrous effects, it might (because there is no EMP, so no way to know how it will be set up, administered, and for what effects it will monitor) simply identify the problems, or, depending on its requirements, it might not. Mitigation is a poor choice and will not help those creatures who are killed by the adverse hydrological impacts. And again, since no plan for the alternate water supply exists, Interveners cannot be sure *that* plan would not *also* have adverse environmental impacts, for after all, there is only a finite water supply and the water at Levy is all interconnected.

> "Uncertainty exists regarding the potential for wetland impacts caused by groundwater withdrawal. Hydrological monitoring to ensure that groundwater withdrawals do not adversely affect wetlands would be required under the State-imposed conditions of certification (FDEP 2010). If wellfield aquifer performance testing, revised groundwater modeling or environmental monitoring of wetlands either detects or predicts adverse wetland impacts, PEF would be required to mitigate the impacts or implement an approved alternative water-supply project (FDEP 2010). (DEIS p 5-42-43)

Examination of the Florida Department of Environmental Protection document does not reassure Interveners that the impacts will, in fact be limited by PEF compliance with this document. For instance:

> Within 3 years of completion of site aquifer testing specified in condition, A.4.a.the Licensee shall submit for District approval, an Alternative Water Supply Plan. (FDEP 2010, Sec A 3 (a))

> Within 4 years of completion of site aquifer testing and modeling specified in condition A.4.a., Licensee shall submit to the District, a preliminary design of the approved alternative water supply project that the Licensee will implement. Ibid.

So, if LNP is damaging the aquifer, PEF has 3 YEARS to even SUBMIT an alternative water supply, another year for a design, and no indication of how long actually to USE an alternative water supply. It is impossible to assess the impacts this might cause and if an alternative water supply plan is implemented.

Following the initial monitoring, FDEP requires compliance reporting at 5 year intervals (FDEP 2010, A 5.). Given the potential for rapid destabilization of conditions due to increased

development, climate change or other unforeseeable factors, clearly these conditions are not sufficient to prevent impacts, only "report" them after the fact. This could result in a seriously damaged or depleted aquifer and the biome which depends upon it.

Finally, A 7 states:

> In all cases, the total average annual daily withdrawal and the total peak monthly daily withdrawal are limited to the quantities set forth above.

This EMP is based on 1.58 Mgd, but the DEIS says LNP may go as high as 5.8 Mgd, which is WAY beyond the allowances of this document.

The fundamental problem with this approach is that monitoring does not preclude harm, it detects it. The Monitoring Plan does not yet exist; there is no guidance cited for how acceptable levels of impact are established; mitigation is after the fact. This is part of a disturbing pattern for this project: when faced with hard questions "kick the can" down the road to a different proceeding.[1] In this case the different proceeding is the currently non-existent "Environmental Monitoring Plan" of the CoC upon which NRC Staff relies to find "SMALL" hydro ecological impacts.

III. The Draft Environmental Impact Statement Does Not Resolve Contention 4

When the NRC Staff produces the EIS, first a draft is published. It is assumed that public comments and other information that becomes available may alter the Final EIS from the Draft. This Motion is tied to the Draft EIS and is based on the differences between the EIS and the ER. Regardless of the differences and similarities of the ER and DEIS, Interveners find that both fall short of accurately assessing the hydro-ecological impact of construction and operation of the

[1] This is a reference to the PEF proposal to generate unlimited amounts of so-called "Low-Level" radioactive waste while waiting to see if there is an off-site disposal location where it can be sent. If not, it will then determine how it will "manage" it.

LNP. Inaccurate and insufficient analysis of the factors outlined in this contention have resulted in impacts incorrectly assessed as SMALL when in fact the direct, indirect and cumulative impacts of all aspects of dewatering and deposition of salt will be LARGE and therefore the zone of impact, overall environmental impacts including those that are irreversible and irretrievable, including impacts to federally listed species and mitigation measures are all inappropriately assessed as SMALL, when they will be LARGE.

C-4 A - 1. Active Dewatering

Dewatering in and of itself will be environmentally disastrous for the Levy County area. The drawdown of up to 5.8 Mgd will severely deplete the surficial aquifer, and the underlying Floridan Aquifer, precluding flow to sensitive wetlands, natural springs and surficial waters in a broad area providing habitat for myriad species, including Federally listed species, around the wellheads. Combined with stresses brought on by salt drift, we can expect this ecosystem to collapse, resulting in irreversible and irretrievable environmental impacts. There is absolutely no way to mitigate for this naturally established system, nor replace the individual plants and animals who will be sacrificed by PEF.

The DEIS fails to correctly identify problems with the underlying geology of the Levy area. This failure to address the karst formation and possibility of sinkholes and fracture issues will directly lead to misidentification of dewatering and aquifer flow issues.

The DEIS states:

> This interpretation [that sinkholes are few, generally shallow, broad and develop gradually] is also consistent with the USGS Ground Water Atlas, which shows transmissivity values in the vicinity of the LNP site that are below the threshold that would be indicative of well-developed karst systems.(DEIS P 2-175, LINE 16).

The karst in the vicinity of the LNP is developed (or developing) enough to be problematic because of dewatering. Although the DEIS states, “few sinkholes occur near the LNP site (Randazzo and Jones 1997; Miller 1986) and the regional transmissivity of the Upper Floridan

aquifer in the area is less than would be expected for well developed karst." (USGS 2000). (DEIS 2-25, Line 15), the Levy FSAR contradicts this (emphasis in bold), "The potential for nontectonic deformation at the site from phenomenon **other than karst-related collapse or subsidence** is negligible. **The LNP site lies within a region susceptible to dissolution and karst development.**" FSAR 2.5-299

The Levy County Comprehensive Plan affirms that sinkholes are an issue "**result(ing) in increased run-off into at least two [2] sinkholes** (emphasis in bold), (Levy County Comprehensive Plan, latest version, 1998 p 7-112) Attachment 6

Sinkholes of Levy County, 2008, a sinkhole map produced by FCIT and USF, also shows multiple sinkholes in the immediate area. It is important to note that this map does not show every sinkhole, but rather only those reported to USF. **Attachment 7**

Levy County also addresses possible water restrictions based on population, indicating that the aquifer is already stressed:

> [Note also that if the water crop is assumed to be as low as 109 m.g.d., the percolation rate to the Floridan Aquifer as provided in the drainage portion of this element, then the threshold population is a much lower thirty-five thousand three hundred thirty-three [35,333] persons ... only ten thousand (10,000) more than residing in the County in 1988!])(Levy County 1998, p 7-155)

The DEIS (p.2-145, line 19) admits that water use by humans is a issue of great concern. While drawing conclusions that the effect on overall water consumption in Levy County would be SMALL, the DEIS selectively depends upon *wide-area* recharge. When assessing impacts, the DEIS only considers *localized* discharge. This does not make sense: The drawdown due to active dewatering is figured within 3 miles of the well sites (DEIS 5-5), but the recharge of 208 mgd (DEIS 5-7) is obviously over the entire regional aquifer. This is illogical cherry-picking.

Most importantly, however, there has been no determination on what the minimum recharge rate is or where maximum aquifer recharge areas occur, even though this is required by Florida Statute (Section 373.0395, F.S.)

The Levy County Comprehensive Plan (Attachment 8) states:

> The task of identifying the nature and extent of groundwater resources available within the state has been delegated to the regional water management districts. Each district must prepare and make available to local governments a Groundwater Basin Resource Availability Inventory [GWBRAI], which the local governments are to use to plan for future development in a manner which reflects the limits of available resources. (page 7-142 of excerpt provided)

There is no reference to a Groundwater Basin Resource Availability Inventory [GWBRAI] in the DEIS, SWFWMD confirms that no aquifer minimum levels have been set for Levy County. On the day of this filing, SWFWMD confirmed that there has not been a Groundwater Basin Resource Availability Inventory [GWBRAI] completed for Levy County (Attachment 5).

These admissions – that the fundamental data: the recharge rate of the aquifer – and any sort of comprehensive resource plan for the groundwater resources of this area DO NOT EXIST removes the basis for any assertion that the water resources of concern will be protected by either the CoC or the COL which according the DEIS will rest on the CoC if it is granted.

The Comprehensive Plan continues (emphasis in bold), "**As previously noted, no water budget is available by which to evaluate the projection of total demand, and this is considered to be the major water-related problem at this time. (Levy County 2008a p. 7-155).**

The modeling used in the DEIS to predict the impact of withdrawing water from the aquifers is incorrect, based on faulty data and not reliable. The dewatering modeling appears fatally flawed. The model predicts less than 1 ft of additional drawdown response at the closest Upper Floridan aquifer user under annual average total LNP usage conditions of 1.58 Mgd. Under maximum daily usage conditions (5.8 Mgd) for a duration of 1 week, the model predicts that increased drawdown will not extend to the closest Upper Floridan aquifer well (i.e., permitted user). DEIS 5-9, line 6. PEF gives no guarantee that the drawdown of 5.8 Mgd will only occur for a duration

of 1 week. It also assumes this drawdown would occur under normal precipitation conditions and fails to address impacts that will occur during dry or drought conditions. It also completely fails to consider the cumulative effects of the Tarmac Mine drawing 1 Mgd in the immediate area of the LNP.

The modeling also shows its failure by the massive change instituted by the recalibration process (emphasis in bold):

> Using the recalibrated groundwater model, up to 2092.9 ac of wetlands could be adversely affected over 60 years of groundwater pumping to support the LNP project, with 563.4 ac occurring within groundwater drawdown zones that exceed 1 ft. **No wetlands would lie within groundwater drawdown zones exceeding 0.5-ft under the original DWRM2 model prepared by PEF** (DEIS p 5-24, line 33).

Thus PEF forced the "model" to explain the current data at Levy, and it cannot, therefore, be relied upon to accurately predict outcomes reflecting either appropriate water drawdown (5.8 Mgd) or the impact of the Tarmac Mine, for which an EIS addressing dewatering does not exist. Yet there still remained unexplained results so the inputs are suspect:

> However, given the limited groundwater-monitoring data available, confirmation of any seasonal recharge-related impacts was not possible. In addition, if decreased recharge was responsible for the observed response, similar results would be expected (but were not observed) for the June 2007 sampling event, which was also preceded by relatively dry conditions (DEIS 2-37, line 25).

The DEIS fails to accurately estimate the effects of dewatering on surficial waters.

The DEIS admits that:

> Based on groundwater modeling, there may be a reduction of 0.4 Mgd of the groundwater 3 discharge to the Lower Withlacoochee River and Lake Rousseau as a result of service-water pumping from groundwater wells for proposed LNP Units 1 and 2.DEIS 5-54, Line 2)

The DEIS inadequately addresses the cumulative dewatering of underground and surficial springs that recharge and nourish the surficial waters of the surrounding area, including increased likelihood and/or magnitude of saltwater intrusion (DEIS p. 2-38, line 3), decreased

outflow of Big King and Little King Springs within the 2.5 foot drawdown miles from the wells, and decreased groundwater discharge to Withlacoochee River and Lake Rousseau (DEIS p. 5-54).

The FSAR also describes this direct connection to the Withlacoochee thus:

> The focus of this evaluation is groundwater that moves downgradient from LNP 1 and 2 and resurfaces within the Lower Withlacoochee River, a distance of approximately 7 km (4.3 mi.) (FSAR 2.4-79).

Also, " the LNP site can be drained by overland flow directly to the Lower Withlacoochee River or the Gulf of Mexico (FSAR p.2.4-3)

C-4 A-2. Impacts resulting from the connection of the site to the underlying Floridan aquifer system

Both the DEIS and the COC fail to address active dewatering that will result from LNP. Staff incorrectly lumps all surface waters together:

> [T]he **use of water from the Gulf would have essentially no impact on it. Therefore, the impact on surface water resources due to LNP use during operations is expected to be SMALL** and further mitigation measures would not be warranted. (DEIS 5-5 -- 5-7, emphasis added)

Interveners note that there is no assessment whatsoever of consequences resulting from the loss of freshwater inputs from the existing outflow of the CFBC to the coastal waters of Withlacoochee Bay and the waters it communicates with, including protected Big Bend Sea Grass Preserve and Outstanding Florida Water Withlacoochee Estuary.

C-4 A-3. Impacts on Outstanding Florida Waters such as the Withlacoochee and Waccasassa Rivers;

On p. 2-30 the DEIS stated that, currently, no minimum in-stream flow requirements have been specified for the lower Withlacoochee River and that the SWFWMD may address this issue in 2011 (PEF 2009f). Intervenors have been unable to locate a flow requirement for Levy County in regard to the Upper Floridan Aquifer, or the Surficial Aquifer. Similarly, the DEIS fails to

account for water quality impacts to the coastal estuary system due to consumption of substantial freshwater contribution at the CFBC. Due to this oversight, the review team's determinations regarding environmental and economic impacts and the alternatives analysis are incomplete.

Freshwater input into Withlacoochee Bay will be reduced by two methods: 1) increased groundwater consumption for service water will reduce spring and base flows in the area, and 2) the Circulating Water Intake System (CWIS) will withdraw freshwater currently flowing to the estuary through the CFBC. Neither of these reductions in freshwater flow into the estuary appears to be accounted for in the DEIS. The DEIS does not appear to take into account the decrease in freshwater input into the estuarine systems.

The DEIS fails to appropriately consider cumulative effects of increased salination in the CREC and the severe estuarine consequences resulting from freshwater in the CFBC no longer mixing with the salt water in the Gulf. There is no analysis, no consideration and no concern for the large impacts to the species now living and breeding in the CFBC and the estuarine waters of the Gulf.

Passive Dewatering

Any discussion of "stormwater" ponds is an admission that water is being forcibly restrained from its historic overland flow. When water is not allowed to follow its established paths, the organisms and land it unrestrictedly would have over flowed is passively dewatered.

When ponds are dug into the surficial aquifer, so that (emphasis in bold) "the pond bottoms will be **below the natural groundwater level, so there will always be some open water in the ponds**" Griffin Affidavit at ¶ 9 (Attachment 10), this creates passive dewatering via evaporation.

The DEIS admits that "The surficial aquifer … was generally encountered at depths of less than 5 ft…."(DEIS 2-24, line 36).

Passive dewatering also occurs because these ponds will be filled only by artificially diverting the water's historic overland flow. Ditches, culverts and swales (which despite an innocuous name are 1' deep ditches, a typical swale being 46 feet wide (Griffin Affidavit ¶ 17) will dewater not only because at times of high water a 1' ditch will be intersecting the surficial aquifer and passively dewatering through evaporation, but also because they divert historic overland flow and dewater areas of the ecosystem evolved to depend on that flow.

When below-ground construction sites, such as the 2 100' deep pits covering approximately 1 acre each for the two nuclear islands (DEIS p. 3-12, line 21) (FSAR figs. 2.5.4.5-201A,B (Attachment 9) [2] are dug, lateral and upward flow of water that would normally be following the natural aquifer flow patterns which distribute it throughout the area will instead collect in that below-ground construction site and will not be available to the organisms accustomed to receive it **on or off-site**. PEF'S expert, Dr. Griffin, confirms this (emphasis bold), "In other instances **the natural groundwater system of a site could be altered indirectly through profile modification, like deep excavations**….," (Griffin ¶ 7). Interveners contend the DEIS overstates the ability of the ponds to recharge the aquifer because aquifer recharge is not merely a mathematical formula, it is a complex process made up of interlocking features that will be irreparably changed by the LNP.

The DEIS clearly states that:

While the GCRP [U.S. Global Change Research Program] has not incrementally forecasted the change in precipitation … the projected change…is a decrease of between 20 to 25 percent in spring and an increase of between 15 to 20 percent in the fall (GCRP 2009). Declines in

[2] Interveners consider it a serious omission that the DEIS does not provide the size of the 100'pits dug for the nuclear island. We had to contact the Staff to find out that this information was instead in the FSAR. Members of the public searching for this information would not have been able to find it. The size of these pits is crucial information.

aquifer water levels may continue throughout Florida, as the aquifers are relied on in response to changes in precipitation and the growth in demand for freshwater" (GCRP 2009)(DEIS 7-12, Line15).

So rainfall levels can be expected to decline, further exacerbating dewatering impacts at Levy. Even without the expected lowered rainfall, there will still be severe evaporative dewatering during drought periods that will cause LARGE impacts to surrounding wetlands.

As discussed in Section 2.3.1.2, groundwater in the Upper Floridan aquifer at the Levy site moves west-southwest from areas of higher hydraulic head east of the site to discharge to local springs and offshore springs in the Gulf of Mexico.(DEIS 7-13, Line 29) This means the Tarmac Mine, 2 miles west of the LNP (DEIS 4-21), withdrawing approximately 1mgd ((DEIS p.4-23, line 3) will be a huge factor in the area's water supply. The DEIS evaluation of Tarmac was cursory and incomplete for the Staff admits "no evaluation of the impacts of water use at the Tarmac mine on groundwater levels and wetlands was performed…." (DEIS 4-23, line 4-5). There is no substantive discussion of the cumulative impacts of two large projects, both digging enormous pits into the aquifer.

Interveners contend that given the similarities between the affected resources as well as the ways in which those resources will be affected by the Tarmac mine and the LNP, these impacts need to be addressed together. 40 CFR 1508.7 specifically provides that …"if a resource is regionally declining or imperiled, even a SMALL individual impact could be important if it contributes to or accelerates the overall resource decline."

C-4 A-4. Impacts on water quality and the aquatic environment due to alterations and increases in nutrient concentrations caused by the removal of water;

The DEIS admits that nutrients will be discharged but not that levels will be exacerbated by the withdrawal of huge quantities of water from the aquifer.

C-4: A5. Impacts on water quality and the aquatic environment due to increased nutrients resulting from destructive wildfires resulting from dewatering.

The DEIS addresses wildfires with the following paragraph:

> …The fire risk in parts of the surrounding area would be reduced through the restoration of a more natural fire regime, as proposed under the wetland mitigation plan for the LNP project (Entrix 2010). These controlled burns would act to reduce fuel loads in upland and wetland areas on and around the LNP site. If wildfires unexpectedly occur around the LNP project, rapid fire response would be expected, drawing from both onsite (LNP) and offsite fire-protection resources. DEIS, 5-28, line 4

Controlled burns are not natural, and actually belies the DEIS, since these controlled burns will release nutrients into the surface and ground waters. Dewatering will only make matters worse. Lastly, there is no mention of what resources PEF is willing to contribute to fighting fires.

The DEIS says:

> Nutrients introduced to groundwater from natural or manmade events such as fires may affect nutrient loading in surface waters. Nutrients would be discharged to groundwater through infiltration of surface waters located as stormwater-detention ponds on the LNP site and are not expected to affect offsite waterbodies such as the Withlacoochee River or Lake Rousseau. Furthermore appropriate stewardship of the site by the applicant is expected to significantly reduce the potential for uncontrolled fires involving onsite vegetation.DEIS 7-32, line 23

First, a nebulous "appropriate stewardship," that implies actions beyond those identified in the DEIS, is inappropriate by NEPA standards in determining the effects on water quality. Second, Interveners have shown previously that there is a connection to Withlacoochee river, as the FSAR confirms.

C-4: B. SALT / SALT DRIFT

The DEIS (p.5-59, line 21-24) asserts that dispersion modeling has predicted the maximum offsite deposition at 6.83 kilograms/hectare/month of total solids at the property boundary west of the cooling towers." The DEIS also states that the prevailing winds at **Levy** are from the **east-northeast** and from the **west**. (DEIS p.2-176, line 35-36) If the DEIS is correct, then logically the offsite deposition from the towers would be not due west (closer to the ocean) but

southwest, and east (away from the ocean).

This wind direction is critical. Winds blowing from the west would tend to distribute the salt drift even further from the Gulf of Mexico, to wetlands unused to a salt concentration that the CREC environment might sustain.

Another modeling problem is that the maximum predicted offsite deposition rate is representative of a "worst-case month of meteorological conditions that occured during the 5-year period of meteorological data." (Howroyd at ¶20). Results are insufficient to accurately reflect the damage done during drought conditions that can, and do, occur over multiple months or years, especially since the model relies on "frequent rainfall that occurs in the area, which would wash salt from leaves and limit the duration of exposure" to mitigate the effects of salt drift (Howroyd Affidavit ¶ 9. Attachment 11) There is no guarantee of rain and after a dry spell, salt will be eagerly drawn up by plants desperate for water. What is not drawn up will enter the aquifer which the DEIS considers "vulnerable" to pollution from groundwater on site and "extremely vulnerable" one to two miles away from the site (DEIS p.2-25, line 19).

The DEIS (p. 5-20, line 32) *admits* that the projected salt drift deposit is within the threshold that causes damage, and that "that rate of deposition might impact more sensitive species, such as corn." The conditions under which pampered agricultural crops live are not analogous to native freshwater vegetation left to fend on its own, enduring stress from artificially-induced water deprivation, *and* increased soil and water salinity. There is no corn on the project site and anyway, using corn as an indicator misses the point which is that there are many salt intolerant *native* species at Levy. The Staff's experts admit that the CREC vegetation is not similar, and that much of it is more salt tolerant than that at LNP (Staff Salt Drift Affidavit ¶ 6) Interveners submit that it would be a LARGE impact to the ecosystem at LNP if the vegetative communities and the species they support were to change in response to salt drift and other stressors.

NUREG-1437, Vol.1, p. 4-42 even notes of impacts from cooling tower operations, “In addition, native vegetation may suffer changes in community structure (Talbot 1979) in response to…difference in species tolerances to drift.”

Interveners’ review of the Aerial Photographic Monitoring Final Report from 1994 (Attachment found, among others, references to a “moderately high density of dead or heavily stressed trees”, Aerial Study p. 5,”

In (Attachment 14) in an RAI from PEF we find the following admission:

> Long term effects of salt drift on terrestrial habitats are not well documented with only a limited number of studies reported in the public domain. Precipitation, humidity, species composition and photoperiod are known to influence salt tolerance, and extrapolating experimental salt deposition effects on vegetation to natural conditions is somewhat speculative due to the complexities of a natural habitat response.

The assertion that no damage will occur is based on speculation and that there has been no evidence supplied to support the idea.

The heart of Contention 4 is that damages from individual causes will be compounded because of the interaction of the myriad stresses building and running the Levy plant.

IV. The Hydro-Ecological Impacts of Construction and Operation of 2 AP1000 Nuclear Reactor Units on the Levy County Site Would be LARGE

The consequential section of C-4 as amended, states:

> C. As a result of the omissions and inadequacies described above, the Draft Environmental Impact Statement also failed to adequately identify, and inappropriately characterizes as SMALL, the proposed project’s zone of:
> 1. Environmental impacts,
> 2. Impact on Federally listed species,
> 3. Irreversible and irretrievable environmental impacts, and
> 4. Appropriate mitigation measures.

The information provided here has demonstrated the inadequacy of the DEIS in its analysis of key issues raised in Amended Contention 4. NRC Staff’s attempt to rely on the State of Florida’s

CoC as a means to dismiss the concerns that Interveners bring must be rejected. The CoC in turn rests on Florida Department of Environmental Protection "boiler plate" language which cannot apply to Levy County because as shown above, and in Attachments 4 & 5, fundamental data (minimum recharge and flow rates) have not been determined and research for planning that is assumed by the State (Ground Water Basin Resource Availability Inventory, aquifer minimum levels) has not been done for Levy County. The interlacing of local, regional, state and federal authorities would be good if it resulted in increased information and protection. In this case, the situation is nothing more than a "cut and paste" where it is obvious that decision-makers are not aware of the level of "cracks" through which key issues, like the protection of the recharge zones for incredibly beautiful springs (please DO go to Dunnellon and Rainbow Springs State Park) and federally listed species of the Withlacoochee and Waccassassa Rivers and estuaries may fall. One would hope that the NRC staff are ignorant of the fact that it is participating in what can only be called a house of cards – not environmental protection.

Other showings include complete denial of the impacts of freshwater active dewatering from the CFBC by the cooling water intake structure; inadequate treatment of the active and passive dewatering due to construction; strong basis to question the assumptions used to project salt deposition and a host of other incongruities that together result in the NRC DEIS inappropriately characterizing the proposed project's zone of environmental impacts, impacts on Federally listed species, irreversible and irretrievable environmental impacts, and appropriate needed mitigation measures as SMALL.

The attached Affidavits of Dr. Sydney Bacchus (Attachment 2, November 15, 2010 with its exhibits and Attachment 15, February 6, 2009 originally filed with the Petition to Intervene, (exhibits available in the docket) underscore that the hazards of construction and operation of the proposed reactors to the hydro-ecology of the Levy and Citrus County area is NOT SMALL;

the direct, indirect and cumulative impact to the hydro-ecology of the area from dewatering, salt drift and changes in nutrient concentrations resulting directly and indirectly from these factors would be LARGE.

In addition, there are a wide range of impacts that remain undetermined because the models upon which PEF, and now NRC Staff base its determinations are not available for independent review. It should be noted that Interveners have identified a modeling expert, Kevin Vought who will participate in Oral Arguments on the matter of the importance of the models on November 17, 2010. Interveners do not have an affidavit from Mr. Vought since we have not had access to the materials for which he could give an expert opinion.

For these reasons, the model files for groundwater impacts should be made available and this contention should be so amended and admitted for full litigation in this proceeding.

Respectfully Submitted,

_____/s/_____

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November 15, 2010

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:
Alex S. Karlin, Chairman
Dr. Anthony J. Baratta
Dr. William M. Murphy

In the Matter of PROGRESS ENERGY FLORIDA, INC. (Combined License Application for Levy County Nuclear Power Plant, Units 1 and 2)	Docket No. 52-029-COL, 52-030-COL ASLBP No. 09-879-04-COL-BD01 November 15, 2010

Certificate of Service

I hereby certify that copies of the Pleading: Amended Contention 4 have been served on the following persons by Electronic Information Exchange on this 15th Day of November, 2010:

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/Signed (electronically) by/

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