

NUCLEAR REGULATORY COMMISSION
ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Alex S. Karlin, Chairman
Dr. Anthony J. Baratta
Dr. Randall J. Charbeneau

In the Matter of:)

PROGRESS ENERGY FLORIDA, INC.)

(Levy County Nuclear Power Plant, Units 1 and 2))

Docket Nos.

52-029-COL, 52-030-COL

**INITIAL PRE-FILED TESTIMONY OF DAVID STILL IN SUPPORT OF
INTERVENORS' CONTENTION C4 REGARDING ENVIRONMENTAL IMPACTS OF
LEVY UNITS 1 AND 2 ON WATER RESOURCES AND ECOLOGY**

Q1. What is your name and your employment?

A.1. My name is David Still. I am a consultant on technical and policy issues related to water management in Florida. I recently retired from my position as Executive Director of the Suwannee River Water Management District ("SRWMD").

Q.2. In what capacity are you providing testimony today?

A.2. I am providing testimony as an expert on water management issues in the State of Florida. As discussed in my attached curriculum vitae (**Exhibit INT202**), I am a Professional Engineer registered in the State of Florida, license #42088. I have a bachelor's degree in agricultural and biological engineering and a master's degree in engineering from the University of Florida. For 18 years, I worked as a regulator in the SRWMD, where my duties included management of the SRWMD from 2008 to 2012. These duties required me to administer all District regulatory programs including the Water Use, Water Well and Environmental Resource Permitting Programs for all of 11 counties and part of 4 counties. I carried out the policies of the

Governing Board and managed approximately 75 scientists, engineers, hydrogeologists, and support staff in support of the water resources in the District. I was responsible for direct contact with House and Senate members, staff, and the Governor's staff, regarding issues related to water resources and drafting legislation required for resource protection. Duties included support and direct contact with all local elected officials. Duties from 1994 – 2002 included direct supervision of all SRWMD regulatory programs.

Q.3. What is the purpose of your testimony?

A.3. The purpose of my testimony is to explain why, in my professional opinion, the Final Environmental Impact Statement ("FEIS") for proposed Levy Units 1 and 2 (2010) (**Exhibit NRC001**) does not adequately address the impacts of Levy Units 1 and 2 (LNP) on water resources and the aquatic environment. For example, the FEIS fails to map preferential flow paths that may be interrupted by the nuclear island for LNP, fails to examine feasible alternatives to groundwater pumping, misses some mitigation opportunities for stormwater, fails to account for drought conditions, uses outdated estimates of available water resources, and fails to adequately assess cumulative impacts. In addition, it is my professional opinion that the authors of the FEIS have placed unreasonable reliance upon future State processes, such as the requirements of the Conditions of Certification ("CoCs"), to limit and measure impacts of Levy Units 1 and 2 related to water use. The NRC's reliance on the CoCs is misplaced, because the State processes have not been correctly applied. As applied, the CoCs impermissibly permit postponement of essential work on alternative water sources, measurement of impact, and mitigation and fail to establish essential parameters such minimum aquifer levels. As a result, the CoC process does not provide a reasonable basis for allowing LNP to be constructed or operated. The NRC cannot reasonably rely upon flawed State processes to excuse its failure to

fully assess the impacts that will be caused by the proposed groundwater withdrawals.

Q.4. Could you summarize what is proposed at the LNP and your major concerns?

A.4 Yes. I understand that Progress Energy Florida (“PEF”) will excavate two large nuclear islands down to 100 feet below ground level, which will be filled with concrete. To supply freshwater for LNP PEF intends to construct four or five groundwater extraction wells to obtain up to 1.58 million gallons per day (mgd) on an annual average basis from the Floridian Aquifer System and up to 5.8 mgd for a week. My concerns are both local and regional. Locally, the nuclear island could disturb existing flow paths, cause passive dewatering through the stormwater system, cause dewatering of local wetlands by lowering the water levels in the surface aquifer system, and allow saltwater to intrude into existing freshwater systems. Regionally, I am concerned that this amount of water extraction combined with other proposed projects could deplete the Floridan aquifer, leading to existing wells drying up or becoming saline and that the FEIS has not accounted for all new proposed groundwater extraction in the cumulative impact analysis.

Q.8. Did the FEIS use accurate statistics for rainfall?

A.8. No. The FEIS used historical rainfall averages, but there are indications that drought conditions are becoming more common. The permitting agency and the NRC Staff have relied upon long-term rainfall records and are not looking at current conditions. For example, the FEIS at p. 2-221 states that “the review team determined that mean annual precipitation in the region is approximately 53 in.,” but we have not received that much precipitation in the past six years.¹

¹ <http://www.mysuwanneeriver.com/index.aspx?NID=345> (Exhibit INT203)

Since 1990 the annual total has been less than the postulated average for 14 of the 22 years.
(Exhibit INT204).

Page 2-21 of the FEIS indicates a reliance on approximately 53” of rainfall that needs to be reexamined in relation to existing conditions, not old records. This statistic is no longer valid when the trend is toward less rainfall and higher temperatures, possibly due to climate change (FEIS p. 2-181). A better indication would be a statistic that reflects the latest climate trends. That would be a 5, 10, 15, year moving average to compensate for the changes. We are not getting our historical rainfall rates throughout Florida, as seen in the rainfall data files from SRWMD (above). Therefore this assumption is invalid and does not represent existing conditions. A consideration of shifting rainfall patterns is not evaluated by the SWFWMD or any of the water management district’s analysis and permitting procedures.

Moreover, in addition to average rainfall, the FEIS should have examined temporal variation in rainfall to determine impacts during drought conditions. When utilizing freshwater from highly dynamic coastal karst systems, one cannot rely upon long-term averaging of rainfall conditions. In the short term, during times of drought, the resource can be destroyed by over-pumping, which leads to saltwater intrusion.

Q.14. Does the FEIS adequately assess the impacts of the proposed stormwater management system?

A.14 No, the FEIS section on stormwater management is confusing and inconsistent. Section 3.2.2.1 of the FSEIS discusses the stormwater drainage in general. The discussion uses the terms surface water retention and infiltration ponds interchangeably. There is no distinction in Figure 3-4 regarding the function of Pond A, Pond B, Pond C1 and Pond C2. Stormwater retention has a specific goal of providing water quality and water quantity improvements. The text reveals that there are filtration ponds, yet the Figure 3-4 refers to infiltration ponds. Other stormwater

features mentioned, e.g. drainage ditches and swales are not shown on Figure 3-4. In Section 3.3.1.1 on page 3-19 the stormwater drainage discusses three water retention and/or infiltration ponds. Figure 3-4 shows 4 distinct stormwater retention areas. In section 3.4.2.1 there is a discussion of the discharge structure related to the amount of discharge water for normal and maximum conditions. Normal daily discharge would be 83.4mgd and maximum would be 87.9mgd. The difference of 4.5mgd is designed to be discharged as excessive stormwater mixed with boiler blow down water during times when the stormwater infiltration ponds are inadequate to dispose of stormwater runoff. It would seem to me as a stormwater professional that this situation is not needed as enough storage could/should be designed to adequately address the stormwater issue. These 4.5 million gallons could be used in the mitigation to hydrate existing wetlands or to store water in areas discussed as historic basin storage (HBS). The need to discharge untreated stormwater before adequate treatment seems to be inconsistent with Best Management Practices and any future proposed Total Daily Maximum Loads (TMDL) or any proposed Basin Management Action Plan proposed in an acceptable TMDL. This practice is also inconsistent with the discussion in 3.4.2.4. In that section on page 3-30, the FEIS discusses the ponds are designed with a 2 foot freeboard and excessive flows will flow out of the ponds through a broad-crested weir emergency spillways and small-diameter pipes and spread to the surrounding wetlands as sheet flow to prevent erosion. That section does not discuss the 4.5mgd that could be discharged with the blow down water. Therefore, it seems that consistency between sections of the report would help the reader instead of confuse. Finally, the FEIS fails to consider the potential for surficial dewatering is evident due to passive dewatering. An unlined detention pond has a permanent pool and the permanent pool in an unconfined aquifer must have water supplied from the surficial aquifer during times of low rainfall. Thus, the

dewatering of areas adjacent to detention ponds will occur during such times.

Q.15 Does the FEIS take adequate account of the karst nature of the local geology?

A.15. Mr. Davies testimony discussed karst geology in more detail, but there is no doubt that the area surrounding LNP is karstic. As Mr. Davies has also testified, in karst environments most water flows through preferential flow paths, such as conduits. The construction of the very large 100 feet deep pits for the nuclear islands could intercept preferential flow paths. Interception of such flow could cause a large change in the amount of water available in other parts of the system. There is not enough site-specific data to tell whether the construction will intersect any significant amount of conduit flow, but this is certainly a possibility. The FEIS is therefore deficient because it fails to map the conduit system.

The failure of the FEIS to account for the karstic nature of the local geology is readily apparent. For example, in Section 2.3.1.1, page 2-21 the following statement appears - “Although not hydrologically connected to the Waccasassa...,” but there is no data showing the lack of connection. In my experience, karst topography has various connections from ground to surface water. The Suwannee system has a number of streams to sink features in the Alapaha and Santa Fe basins. In karst regions it is not uncommon for groundwater and surface water to be hydrologically connected.(USGS Circular 1139, pages1-2) (**Exhibit INT214**). Unless the data shows no sinkholes in surface systems or areas where the groundwater is not contributing from spring flow to surface flow, most flow is connected through groundwater. Therefore, any impact on groundwater in the Floridan Aquifer resource will have an impact on the surface water levels. (USGS Circular 1139) (**Exhibit INT214**).

Illustrating this point, a number of recent articles in the Gainesville Sun show that pumping and prolonged drought can cause catastrophic surface conditions to occur in karstic areas. The articles discuss the dangers of sinkhole formation and show a large new sinkhole 80

feet long and 40 feet wide and growing that has opened up on a residential property in Jonesville.

Exhibits INT205 and INT206.

Q.16. Did the FEIS adequately analyze alternatives for fresh water supply?

A.16. No. The FEIS fails to consider whether the proposed supply of freshwater for LNP would be reliable during drought conditions, which are occurring with increasing frequency. Such an alternative supply could drought-proof the facility during times of extreme drought, which according to the weather patterns are occurring more frequently (FEIS 2-181). One excellent source of alternative supply could be the waste water flows from nearby communities. This alternative could be a win-win for the municipalities because it could reduce their disposal costs and it could give LNP a constant supply of available fresh water without using groundwater. Section 9.4.3 (p.9-249) of the FEIS stated that Progress Energy Florida (“PEF”) examined a variety of potential alternative sources of fresh water for the service water system including municipal freshwater supply from an adjacent city or the Crystal River Energy Center (“CREC”), and reclaimed water (municipal wastewater) from an adjacent city. The reason these alternatives were rejected was because “nearby communities and CREC do not have excess capacity and there are no communities in the vicinity of the Levy County site that have sufficient wastewater to meet the system needs” (FEIS p. 9-249). However, even if no single community or source has sufficient volume of excess wastewater, the combined volume of all nearby communities’ wastewater should be considered, perhaps combined with other supplementary sources, such as groundwater extraction. It is apparent from the FEIS on page 9-249 that some alternatives were considered, but none would provide an alternate source of fresh water. I believe more analysis is needed to include such alternatives and that the FEIS is deficient without such analysis

One other potential supplementary source is desalination. If small municipal water suppliers, like the Town of Suwannee and Horseshoe Beach can implement a reverse osmosis to obtain potable water, industry/power generation and others that can and will have impacts could use desalination of seawater as an alternative fresh water supply.

Furthermore, the FEIS does not contain any analyses to justify the statement that: “the review team identified no alternative that was environmentally preferable to the proposed plant systems design.” (FEIS p.9-251). I strongly believe other alternatives would indeed be more environmentally preferable. At minimum, the FEIS should contain some analysis to support this statement. While the cost of the examined alternatives may not be attractive, neither is the continued extraction of groundwater when we already have a worsening saltwater intrusion problem along the coastal areas caused by groundwater use. For example, a June 15, 2012 personal communication with Jack Hotaling, engineer with the Cedar Key Water and Sewer District (CKWSD) confirmed that although the last time we talked his District was not having salt water problems since moving municipal wells inland, but for the past month, the salinity has been higher than normal in the production wells. Mr. Hotaling initially believed it was an instrument failure, but it was not the instruments, because one of the wells was over the Maximum Contaminant Level (mcl) for chlorides. The MCL is the regulatory limit for drinking water. Conditions continue to deteriorate near the LNP -- on June 20, 2012, the Gainesville Sun reported that residents of Cedar Key were being ordered not to drink tap water until further notice because of salt intrusion of the District's wells. According to the CKWSD, the salt-water intrusion common in North Central Florida wells is because of "drought and low groundwater levels."

Similarly, the Taylor Beach Water System which includes Dekle Beach and Keaton

Beach municipalities northwest of the proposed LNP site, have encountered water quality problems, such as saltwater intrusion, while withdrawing smaller volumes of water than the 1.58 mgd proposed for the LNP and both were forced to either relocate their wells further inland or to implement reverse osmosis to remove the salts. (**Exhibit INT206, Exhibit INT207, Exhibit INT208, Exhibit INT209, Exhibit INT210**).

Q.17. Does the requirement to develop an alternative fresh water supply at a later date change your opinion about the need to develop such an alternative before project implementation?

A.17. No. Under state law, the specific use of groundwater needs to be examined and a definitive decision made as to which alternative source should be considered for use instead of withdrawals from the Upper Floridan aquifer (Chapter 373.016,4(a) Florida Statutes) (**Exhibit INT211**). However, in the Conditions of Certification Progress Energy Florida Levy Nuclear Power Plant PA08-51C Modified January 25, 2011 (**Exhibit INT212**) SWFWMD describes a schedule for implementing alternative water supply development:

- a. Within 3 years of completion of site aquifer testing specified in Section C. Plant Specific Conditions, Condition II. Southwest Florida Water Management District, A.4.a. the Licensee shall submit for District approval, an Alternative Water Supply Plan. The Alternative Water Supply Plan shall evaluate, identify, and propose alternative water supply development of one million five hundred eighty thousand (1,580,000) gallons per day (gpd). (p.44)

The existence of this schedule shows that the current assessment of alternative water supply is inadequate. The very wide range of uncertainty in the predictions of groundwater impact means that it is not possible to be sure that the withdrawal of less than 1.58 mgd will have small impact. Instead, the study of alternatives should be required from the applicant and included in the FEIS before the plant is constructed or operated. Indeed, as this testimony is being drafted, historic low groundwater levels are being experienced in Florida, particularly in Suwannee River Water Management District. **Exhibit INT213** is a report to the SRWMD Governing Board that shows

the number of dry wells in the SRWMD for 1 December 2011 through 10 May 2012. Home owners in the area do not have any alternative supply, so in times of drought their needs should get priority over LNP because PEF has the ability to develop and provide water through an alternative source. Evaluating the use of alternative sources by the applicant early in the planning process would provide for a drought resistant water supply and would avoid competition between home owners and LNP for scarce groundwater resources. **Exhibit INT216** shows that current drought conditions are causing many residential wells to run dry. The pumping at LNP could add to these problems.

Q.18 What are the other advantages of developing an alternative water supply?

A.18. Currently, all water management districts are struggling with reprioritization of staffing, limited funding, and scarce resource allocation. In 2011, water management districts, statewide, experienced a \$700 million dollar budget cut. The development of an alternative source supply by the applicant would eliminate expensive conditions required in the Conditions of Certification for both the applicant and the agency. As the staffing levels continue to decrease at SWFWMD (Guillory, AWRA meeting, personal conversation, St. Petersburg, Florida, May 2012) it is possible that compliance with the Conditions of Certification could be ignored or eliminated. Developing a robust alternative freshwater supply would ensure proper allocation of human and environmental resources.

Q.19 Is it reasonable to rely upon the other Conditions of Certification to prevent LARGE impact?

A.19. No. There are many defects with the permitting process used to derive the Conditions of Certification. First, the SWFWMD should have issued a permit for all the consumptive uses, even those from the Gulf and the Cross Florida Barge Canal (“CFBC”). Although the water that is used is transported from those water bodies to be used at Levy NP, it is still used. The FEIS

cannot rely on the SWFWMD findings for permitting without checking to ensure that they rest on sound scientific principles. In this case, because the permit does not cover all consumptive uses, it is fatally flawed. Second, even though the FEIS relies upon compliance with the Conditions of Certification to prevent LARGE impacts, there is not enough information available in the Conditions of Certification to assess how the SWFWMD determined the water allocations from District ID/Owner ID wells 1/PW-1 through 4/PW-4 would preclude LARGE impacts on the local environment. That information would require a detailed modeling of ALL water consumption projects in the area, which as I discussed above, was not done. Also a detailed description of how PEF determined that 395,000 gallons per well was the quantity below which impacts would be small. Third, a number of plans to monitor and mitigate impact have not been developed. For example, the Conditions of Certification mention a “Water Conservation Plan” on p.52-53, but do not specify what the exactly plan is and do not require it to be prepared before project implementation. There is no way to evaluate a non-existent plan, but the FEIS should examine whether PEF could conserve or reduce the need for fresh groundwater. In addition, a number of other plans are not yet developed, but are necessary to enable impact to be accurately assessed. The FEIS should have reviewed details of the following plans before assessing impacts:

- Environmental Monitoring Plan (FEIS p.5-44)
- Dewatering Plan (FEIS p. 4-34)
- Storm Water Prevention Plan (FEIS, p. 4-25)
- Erosion and Sedimentation Plan (FEIS p.4-25)

Even more egregiously, as stated in 2.a.i of the Conditions of Certification, PEF may be released from the Environmental Monitoring Plan (EMP). In my opinion, this condition undermines any

justification for the reliance in the FEIS on the EMP to preclude harm, and its conclusion that the EMP will result in small impacts. As long as the applicant uses groundwater from the Floridan aquifer, PEF should be required to monitor parameters like water levels in the Floridan and surface aquifers, salt water intrusion, impact on neighboring wells, and changes to wetland hydroperiods. The results from the EMP are the only way of showing that the environmental conditions established within the Conditions of Certification are maintained. The conditions for release from the Environmental Monitoring Plan should be consistent with the development of alternative supply instead of groundwater from the Floridan aquifer. For example, once the applicant implements an alternative that is acceptable and there is no more use of groundwater, the applicant could then be released from the EMP.

Moreover, on Page 49 of the Conditions for Certification, the following statement appears:

The Licensee may make adjustments in pumpage distribution as necessary up to 125 percent on an average basis, up to 125 percent on a peak monthly basis, so long as adverse environmental impacts do not result and other conditions of this certification are complied with. 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 condition is ambiguous. The most likely meaning is that PEF could redistribute its 395,000 gpd per well pumpage by 125 per cent, so that it would be possible to pump up to approximately 500,000 gpd from two wells and substantially less from the others. In that case, the modeling in the FEIS predicting the drawdown effects of pumping the 4 wells specified in the document would underestimate the potential local impacts. However the condition is interpreted, it appears that the FEIS failed to consider this aspect of the Conditions of Certification in the analysis and is therefore deficient.

Q.20 Are there other inconsistencies between the FEIS analysis and the Conditions of

Certification?

A.20. Yes, the information in the FEIS is clearly incomplete and incompatible with the Conditions of Certification which are the controlling document. For example, although the FEIS refers only to four groundwater wells, the permitting agency in charge, SWFWMD, has issued a permit to PEF for FIVE wells (Permit 13262, **Exhibit INT215**). The FEIS (p.3-21) says the wells will be cased to 150', however the Conditions of Certification only require casing to 100' (p. 41). The casing diameter is not provided in the Conditions of Certification, but is provided as four 16 inch diameter wells in the FEIS in section 3.3.1.7. (p. 3-21). The FEIS p.3-21 says each well would have a 1000 gpm capacity or a total of 5.76 mgd, far more than the maximum of 1.5 mgd allowed in the Conditions of Certification.

The FEIS, in section 3.3.1.7 describes the need for only 550,000 gpd for construction, but the total consumptive use of water is not documented. This use and the description of the use does not appear in the Consumptive Use Permit issued by SWFWMD. It seems that the SWFWMD has ignored a basic definition of water use. In 40B-2.021(26) Florida Administrative Code (**Exhibit INT205**), which should apply to ALL Water Management Districts because of the regional nature of the water, it states that water use means any use of water which reduces the supply from which it is withdrawn or diverted. Therefore the District should include the withdrawal from the CFBC as a consumptive use of water. Failure to address this withdrawal underestimates the consumptive use and does not reflect the total amount of water needed for construction and operation of the plant.

Q.21 Turning to regional impacts, did the FEIS use the most up to date estimates of current regional water allocation?

A.21 No, the FEIS used unacceptably out-dated estimates of existing water allocation.

The data from the SRWMD 2004 that the FSEIS uses is inaccurate and is corrected in the

SRWMD Water Supply Assessment adopted by the Governing Board in 2010. **Exhibit INT216.**

A major shift in water supply planning at Suwannee River Water Management District took place in 2007 after the Minimum Flow and Level (“MFL”) for the Upper Santa Fe was adopted.

The agency shift in policy was due to impacts from outside the District. The uses outside the District had tremendous impact on the projections of water use. The District could no longer consider only project uses within the District, but was mandated to recognize uses outside the District when determining current projections for water supply planning and available water supply. Four areas, the upper Santa Fe, the lower Santa Fe, the Alapaha and the Upper Suwannee areas were identified as not having enough water to meet water use projections in 2020 and this set into motion the creation of water supply planning regions. This again was due to impacts resulting from uses occurring outside the District. At present water use outside Levy County is having major impacts on the LNP area, showing that there needs to be a consideration of the regional nature of the ground water resource. Water withdrawals from groundwater extraction particularly from the utilities, and specifically, Jacksonville Electric Authority with a permitted capacity of 155 mgd, have been shown to have an impact on the upper Suwannee and Upper Santa Fe River Basins. (USGS Letter dated 8 June 2011 to Doug Munch, SJRWMD)

Exhibit INT218. This over pumping is also the cause for the decline in lake levels in the Keystone Heights area. This provides further empirical support for other testimony that water is regional in nature and cannot be viewed from only a localized point of view.

In addition, the 2010 document gives a better estimate of long-term water use and would be helpful in the analysis to determine potential impacts to the basin. The 2004 document indicated that there were no areas where the water supply would be exceeded in 20 years. The 2010 document identified areas where the water demand would exceed the supply (page 5 of the

executive summary, SRWMD Water Supply assessment). Because of my former position as director of the Suwannee River Water Management District (SRWMD), I am aware that the entire area along the border of (SRWMD) and South West Florida Water Management District (SWFWMD) had been identified as an area of concern, but the area along the St. Johns' River Water Management District (SJRWMD) border was of even higher concern. Because of limited funds, the District decided to focus on the SWFWMD/SJRWMD border. This does not mean that there are not significant problems with the sharing of resources between SRWMD and SWFWMD (the District responsible for the permitting of LNP). The use of the 2010 WSA and impacts from projects immediately outside the SRWMD (Tarmac, LNP, Adena Ranch) on the Floridan aquifer could lead to the area being designated as a Water Use Caution Area. This designation would then generate a regional water supply plan and trigger a closer look at the associated cumulative impacts of areas' water resources. This would be positive in that the regional groundwater would be better protected. Thus, the failure to use the 2010 assessment in the FEIS is a major deficiency that invalidates the conclusions drawn about the significance of the cumulative impacts.

Furthermore, the water use estimates (SWFWMD, 2008) do not accurately depict the current water use in the area and the projections of water use to 2020 have been impacted by other factors that have not been considered in the FEIS. Agricultural use of water has been changing rapidly due to the transient nature of crops, which are grown in response to market demands. For example, peanut production has replaced many of the traditional agriculture practices in Levy County, including silviculture in many areas. Farmers rely exclusively on groundwater because there is no available alternative source of freshwater in the area for agricultural production. Many of those new permits are in Levy County and in close proximity

of the LNP. For the 6 month period August 2011 to January 2012, the Suwannee River Water Management District permitted approximately 44 million gallons of new water withdrawals. The majority of the water was for new agriculture production. This increase was not anticipated in the SRWMD District 2010 Water Supply Assessment and thus, although permits were issued, the potential impacts on groundwater resources in the area were not considered.

The bibliography on FEIS page 2-217 indicates that the SRWMD Water Supply Assessment was accessed on June 23, 2011, and also on FEIS p. 2-148, it admits using “Estimates from the two water districts for 1985–1990.” In 2011, the current 2010 Water Supply Assessment was also available for use and that data should have been used because by the time the FEIS was issued, the 1990 data were obsolete. This is an error that must be remedied to provide accurate conclusions regarding water supply and the availability of water found in the 2010 Water Supply Assessment.

Finally, there are a number of specific problems with the water use assumed in the FEIS. In the FEIS p. 2-31 Staff assumed 3.51mgd as an input to SWFWMD’s DWRM2 model “groundwater use by all permitted users...was specified as **3.51 Mgd in 2001**” (emphasis added). Because the data is now 11 years old and the distribution of groundwater use has changed, it is not a correct assumption. The use of this inaccurate data will yield wrong results and the conclusions that are based on the model output will be erroneous. It will possibly over allocate water in this area that could lead to the same situation SWFWMD experienced in Pasco County in over allocation. That situation stated what is commonly referred to as the Tampa Bay Water Wars. An over allocation is similar to writing checks from a bank account with no idea about how much money is in the bank. In most situations, you will overdraw the account, or similarly, you will have environmental impacts from over allocation of the water resources.

Q.22. Do the State Water management districts routinely undertake regional groundwater resource planning?

A.22. No, regional groundwater resource planning has been hampered by the Water District boundaries that are based upon surface water boundaries. As an example of consequences of the failure to mandate regional planning for groundwater resources, it is possible for a District to set a Minimum Flow and Level (MFL) within a surface water basin that is influenced by groundwater. However, if the MFL abuts a surface water boundary of another water management district, there is no specific statute that requires the MFL to be implemented in the other district even though the groundwater resource is shared and the potential for impacts outside the region is great (Krause, P.E. and Robert B. Randolph, 1989 p.D-6). The SRWMD has a minimum flow and level set for the upper Santa Fe. If a large user were to request a permit for the SJRWMD side of the District line, and it impacted groundwater on the SRWMD side, the SJRWMD would not have to use the MFL as review criteria for the permit.

In September of 2011, the Suwannee River Water Management District (SRWMD) and the St. Johns River Water Management District (SJRWMD) executed an Interlocal Agreement to begin to share information and work together to solve regional issues associated with groundwater. This action is needed by all Districts with common borders that share resources. As stated earlier, the water districts were delineated on surface water boundaries, and the geographic boundaries are listed in Chapter 373, Florida Statutes. These divisions were based on water flow from and to particular surface water boundaries called watersheds. No consideration was given to the shared groundwater or on issues related to groundwater boundaries. As the former Executive Director of Suwannee River Water Management District, I recognized that more cooperation between Suwannee and SWFWMD should have happened as a result of the large uses of water in the area. Because of the SRWMD's limited staff and resources, our focus

was concentrated in regulating the north east part of the District. Without an agreement with SWFWMD (such as exists with SJWMD) there has been no consideration in the State permitting process of how the proposed LNP and the Tarmac mine would affect the people and environment in the SRWMD. The FEIS needs to fill this gap by doing a comprehensive cumulative impact study, but has failed to do so. Such a study is essential prior to allowing consumptive uses that have the potential for environmental damage, saltwater intrusion, loss of flora and fauna, or other potential harmful effects, such as those proposed at LNP.

Q.23 Are the local water districts well equipped to do regional water allocation?

A.23. No. As the available groundwater continues to be permitted by the water management districts, a complete understanding of all uses in the area is needed. The districts are required to permit water for all uses. It is a process that involves policy, politics and science. In fact, the policy of adopting a Prevention and Recovery Plan was implemented because it was determined that over permitting of water was the normal occurrence. Complex tools are needed to evaluate water use permits, but those tools are expensive, and smaller districts, like the SRWMD, have not had the financial resources to invest in tools to make well-informed water use decisions. The current North Florida Model being used by SRWMD is used for planning purposes and does not have the accuracy to determine localized impacts from pumping. I believe the DWRM2 model used at Levy is equally unsuitable, because it does not take account of local features such as conduits and other preferential flow pathways.

Appendix B of the Environmental Impact Statement for Combined Licenses (COLs) for Levy Nuclear Plant Units 1 and 2, Final Report, lists agencies that were contacted during the process. The list included agencies located in Levy, Gilchrist, Lafayette, and Dixie Counties, all of which are located within Suwannee River Water Management District. It does not appear that

the Suwannee River Water Management District itself was contacted, since it is not listed. This is a major failing because the Floridan aquifer is shared between the Districts and specifically, the SRWMD shares Levy County.

Q.24. Are minimum aquifer levels essential and have they been set by the Conditions of Certification?

A.24. Minimum aquifer levels are essential, but have not been set. The setting of such levels is required by Florida Statute (Section 373.0395, F.S.). 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. There is no reference to a Groundwater Basin Resource Availability Inventory [GWBRAI] in the FEIS, SWFWMD confirms that no aquifer minimum levels have been set for Levy County. The SRWMD has also not prepared a Groundwater Basin Resource Availability Inventory. Without this important tool, it becomes even more difficult to determine the environmental impact of water withdrawal from the Levy nuclear plant.

Q.25. Did the FEIS reach justifiable conclusions regarding the cumulative impacts of the project?

A.25. No, the FEIS does not address the regional nature of Florida surface and groundwater and the conclusion of small impacts to water resources are in error. Florida's water management districts were set up as regional agencies recognizing the regional nature of surface and groundwater (See Chapter 373.016(2), 3(b), 4(a) Florida Statutes). When active dewatering, or consumptive uses (as defined in Chapter 373, Part II, Florida statutes) are permitted, the local water district must consider whether the use is reasonable and beneficial, whether existing legal users will be affected, and whether the use is in the public interest. This test, known as the three

prong test, should have been used to evaluate water uses at the LNP. There are a number of studies, particularly in northeast Florida, that show the regional nature of water resources, particularly surface and groundwater interaction. These studies are relevant to this location since the Floridan aquifer regionally covers this area also. (Grubbs, Jack W., 2011, p.166), **Exhibit INT218.** A thorough review of all water uses should be required at the FEIS level to determine impacts to ground and surface waters.

The FEIS fails to provide the required review. For example, the groundwater withdrawal impacts of several large users in the vicinity, such as the Tarmac Mine, Knight Farm sand mine, and the Adena Ranch are either not considered at all (Knight mine, Adena Ranch) or not adequately considered (Tarmac mine) (see Bacchus testimony Answers 27, 33, 36, 39, 42, 43, 46, 47, 50, and associated figures). In addition, on page 2-31, the FEIS discusses “current groundwater use near the LNP site” by looking at the number of well permits (which are also known as Consumptive Use Permits- CUPs). There was no attempt to do a spatial analysis of where these uses occurred. This is important because if there are many wells in close proximity, the local impact on the resource can be much more severe than if the withdrawals are spaced widely. The FEIS also did not evaluate Environmental Resource Permits (ERPs) which are not for water withdrawals per se, but permit land use changes. Land use changes, such as occur with mining (which is not considered a consumptive use unless it involves mechanical dewatering but does impact the resource through passive dewatering-evaporation and diversion of historic sheet flow and changes preferential water pathways) and stormwater management, can both contribute to adverse cumulative impacts. If there is no analysis of these impacts, the FEIS cannot make an accurate prediction of cumulative impacts. This type of detailed inventory is available from Districts and other state and federal permits and should be used to determine the cumulative

effects on the ground water and surface water impacts in the area.

Overall, there is not enough information in the FEIS to determine potential short and long term cumulative regional and local impacts to water resources or if the impacts are small as described.

Q.26. Do you swear in accordance with 28 U.S.C. § 1746, under penalty of perjury, that this testimony is true and correct?

A.26. Yes I do.

Executed in accord with 10 C.F.R. § 2.304(d) by:

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June 26, 2012

CORRECTED JULY 6, 2012

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