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January 11, 1985

Ms. Eleanor Adensam
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Ms. Adensam:

Formal comments to replace earlier handwritten comments submitted January 7, 1985 are attached. I appreciate the extension of time given to me by Mr. D. S. Hood during our telephone conversation January 7, 1985. Considering that the holiday season occurred in the middle of the scheduled DES review period, the complexities of an environmental assessment for an electric generating plant, nuclear or fossil-fueled, the almost impenetrable barriers created by jargon, pseudotechnical, and technical language, my review could not have been as complete as it is without an extension.

I feel my own review is insufficient. The subject is too complex, too broad, to be studied in the allotted time. The Vogtle DES should receive a full peer review, and not published until such a review has been completed.

Thank you for your attention to these comments and for being allowed to comment.

Sincerely,

Wf Lawless

William F. Lawless
Assistant Professor of Mathematics

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Plant Vogtle Draft Environmental

Statement-Comments

W.F. Lawless

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January 7, 1985

Vogtle Electric Generating Plant

Draft Environmental Statement (NUREG - 1087)

General and Specific Comments

General Comments

1. The DES does not describe in detail the VEGP radiological and hazardous contaminant airborne and liquid effluent monitoring network. It is commonly accepted that monitoring devices may generate data that is of little value due to either poor location, installation, poor development of the monitoring device and its instrumentation, the process of sampling or poor sample analysis. The DES inadequately treats many aspects of this problem, e.g., no rationale on the groundwater well monitoring locations has been provided in the DES: well monitor locations can preclude the generation of meaningful data or can predetermine a data skew. The absence of an indication that contaminants are migrating in the aquifers underlying Vogtle may not mean that the aquifers are free of contamination.

Uniform reporting methods of environmental conditions have not been adopted in this DES. All VEGP sources of water, groundwater, water transportation systems, and waste water systems must be reported in a manner that makes the data accessible so that a determination can be made that a water source has been contaminated. The Savannah River Plant (SRP) manner of reporting contaminated mercury migrating at SRP will provide an example of the difficulty of interpreting groundwater data. The SRP radioactive waste burial ground has approximately

10,000 lbs of mercury buried in the soil. The migrating levels of mercury in the groundwater under the SRP burial ground have in the past usually been just below the EPA drinking water standards (DWS) and the Savannah River Plant has reported these levels against the DWS: "A detailed mercury analysis of waste from 89 burial ground and perimeter wells, following EPA procedures, was completed and showed no mercury concentrations presently above drinking water limits." (1, emphasis added) At the same time, in the adjacent Savannah River Plant F- and H-Area radioactive seepage basins, mercury is also migrating in the groundwater from the basins, but at highly elevated levels up to a maximum reported level of 25 times over the EPA drinking water standard. (2) The SRP makes only passing mention of this data but does not compare it to drinking water standards (DWS) as before; however, the EPA has commented that the SRP groundwater contaminant loadings "...demonstrate a method of discharging pollutants to a stream without a permit by using the groundwater as the medium of transport." (2,3) The Savannah River Plant does admit that "The ground-water down gradient from these seepage basins shows mercury concentrations 100 times higher than background levels." (2)

2. The Vogtle DES contains many erudite technical conclusions resulting from the use of numerous, but what appear to be, unvalidated technical models. The technical conclusions cannot be assailed without validation from two perspectives, either by finding groundwater contamination in the VEGP aquifers in the future or by showing that similar technical conclusions at other

facilities have been controverted. National groundwater contamination statistics are not only relevant to the DES, the DES cannot be adequately assessed without those data.

3. The Vogtle VEGP consultant and technical staff that has generated or collected most of the technical data, if paid, would be expected to be more strongly influenced than the well known Rosenthal experimenter expectancy effect might predict, (4) because the VEGP consultants would have been compensated financially for their technical contributions; but the NRC technical staff that has written the DES may be subtly affected by the experimenter expectancy effect also. The Rosenthal experimenter expectancy effect is a well documented research bias displayed unwittingly by an experimenter that can skew or lead technical statements to a certain conclusion. As F.W. Bessel, a German astronomer, first proved in 1815, individual differences even amongst the most experienced astronomers can lead to observational differences. The Rosenthal experimenter expectancy effect describes an individual difference that skews an experiment or the collection of data along lines of a researcher's bias or prejudgment. How much independent data gathering has the NRC staff done and will do at VEGP? Has an independent assessment of the NRC staff's analysis of VEGP been completed? Will the NRC staff's technical assessments of the VEGP be independently peer reviewed? What is the total cost to the NRC to which produce the DES? What portion of the total cost was paid to which subcontractors and/or consultants?

An example may help define a part of this problem. The Savannah River Plant annually publishes public and internal environmental data collected on and off the SRP plant site, neither subject to peer review. The 1978 annual monitoring public document, DPSPU-79-302, was publically criticized in January 1984 for underreporting the maximum levels of alpha radioactivity migrating through ground-water monitoring wells by 67 times, underreporting the maximum non-volatile beta level by 155 times, and underreporting the maximum tritium level by 58 times. (3,5,6,7) Further, the average reported tritium levels in burial ground monitoring wells in 1978 averaged 563 pCi/ml in public reports and 90,000 pCi/ml in internal Savannah River Plant reports, an underreported difference of 160 times. (3,5,6,7) Since the underreporting was criticized, a new annual report on year 1981 has been released; (8) the new report shows an increase in overall radionuclide migration since the 1978 internal and public data was published: the 1978 private and 1981 public data for maximum levels of alpha in groundwater are about the same (from 161 to 157 pCi/L), the maximum level for non-volative beta increased more than three-fold (3100 pCi/L to 10,633 pCi/L), and the maximum level for tritium increased twice (2,002,000 pCi/ml to 4,330,230 pCi/ml). (5,6,7,8) A researcher or organizational bias can influence the data and conclusions reported.

4. The time period for the technical review of this Vogtle draft environmental statement (DES) has been inadequate. It presupposes that technical assumptions and methodology and conclusions associated with this DES are either obviously correct

or flawed, and that appropriate technical assessment(s) of the DES can be responsibly made within a legally monitored and timed framework. Science, and the technical, possibly also the non-technical, and environmental questions raised by the Vogtle nuclear electric generating plant, cannot be slaved to business or bureaucracy without risk to all involved; the more important the environmental questions, the greater the risk. The DES should be submitted to an independent peer review, and not published until that peer review is completed, whatever the process.

5. The DES states there is no need to consider the purpose and need for power issues, specifically, the merit of whether or not the VEGP should be provided a license to operate based on the demand for power. Although not discussed, this decision by the NRC assumed that nuclear power plants are lower in <u>total costs</u> (preconstruction, construction, licensing, operations, post operations, and decommissioning) than conventional plants or other alternatives. The NRC attests only that "substantial information exists that support an argument that nuclear plants are lower in <u>operating costs</u> than conventional fossil plants." (p.21, emphasis added). Whereas this statement may be true, it may also be misleading. It may also reflect a predetermination to license VEGP regardless of the environmental obstacles confronted by VEGP.

The environmental statement cannot be adequately assessed without a careful study of the total technical and environmental basis for the VEGP, including the engineering assessment of the economics and the demand for power, both a vital part of the technical basis. It is only after all the facts are available and woven into a coherent whole that a decision should be made that a nuclear facility is more economical than other generating capacity, a conclusion the DES has prematurely reached. The NRC decision not to consider and publish in the DES the purpose and need for power issues may mean that the NRC is unable to prove the need for power or for the Plant Vogtle Electric Generating Plant. If the need exists, it should be published in the DES.

6. What financial assurances exist that VEGP will be able to fund not only the post operational environmental radiological monitoring programs associated with decommissioning the VEGP plant, but also the cleanup of contaminated soil and groundwater at VEGP? Since the predominant well pattern in the area presently surrounding VEGP indicates a preponderance of groundwater table wells (FSAR), what technical and financial steps will VEGP take to return the 3,169 acre VEGP site back to the public domain free of radionuclide and hazardous waste contamination in the water table aquifer? The groundwater contaminant washout period under the SRP radioactive burial ground has been predicted to be at least 100 years for tritium, i.e., it would take 100 years after SRP operations cease before the groundwater under the burial ground would be safe to drink considering only the current levels of tritium contamination in the groundwater. (3)

7. The issue of whether or not the marl underlying VEGP is an aquiclude and a barrier to the downward migration of contaminants into the Tuscaloosa aquifer is discussed under Specific Comments 9 and 21.

8. Cooling tower impacts are discussed under Specific Comment 12.

9. Radiological impacts are discussed under Specific Comment 13.

Specific Comments

1. Figure 4.2 does not clearly locate surface ponds.

2. Figure 4.10 does not clearly denote distance.

3. Figure 4.11 graphic scale is not clear nor can either the topographic elevations or the legend be read.

4. Figure 4.12 is not easily oriented to VEGP and has no discernible scale.

5. Table 4.5 does not include EPA drinking water standard (DWS) statistics for each characteristic. Some of the releases may exceed the DWS and should be questioned, e.g., iron, mercury, lead and chromium all appear to exceed the EPA DWS at the point of discharge, but this information is not accessible on page 4-42 (partially resolved on page 5-104). Table 4.5 should also include the average high-low Savannah River concentrations of the released effluent characteristics (partially resolved by Table 4.8) and the effluent characteristics should be bounded by ranges (high-low release concentrations). Each liquid effluent characteristic chemical should be identified by source (Table 4.2) and totaled in Table 4.5 in order to account for all biocide/chemical use at Vogtle; waste radionuclides should be included. In Table 4.5, for effluents exceeding DWS standards, release permits should be identified (e.g., chromium and iron are identified in the NPDES permit, Appendix E). Calcium, sodium and phosphorous releases appear to substantially exceed the average Savannah River water quality characteristics; this should be identified. The impact of these releases, those that exceed DWS standards and those that exceed average Savannah River water

quality data, on the Savannah River biota should be discussed. Copper is misspelled. Table 4.5's title should include the word "predicted." The effluent release point is not identified.

Production water well and observation well information is inaccessible and appears discordant. The DES appears to indicate that there are only two makeup water wells, and no others, but the FSAR and VEGP responses to questions indicate that there are up to 8 production wells. The number of observation wells seems even more elusive, anywhere from 36 to 47 wells, possibly not counting piezometers (piezometers should be located). The well locations are poorly defined, the observation network not explained.

The available water quality in the water well data should be measured against Table 4.5, characteristic for characteristic. Otherwise, migrating contaminants would not have a datum to be measured against. This should be duplicated for surface and spring waters.

6. There is no comparable table to Table 4.5 in the DES to account for surface releases (into sediment and surface ponds, sumps, retention basin, holdup tanks or other possible surface groundwater entry points) and their predicted water quality impacts.

7. Page 1-1, Section 1.1, first paragraph. A detailed statement should explain why the applicant cancelled VEGP Units 3 and 4.

8. Figure 4.3 The VEGP monitoring well network should be descriptively associated with Figure 4.3, especially the retention basin, startup pond, blowdown sump, and the discharge waste water drainage lines at key points. The average combined effluent discharge in Figure 4.3 of 10,285 gpm should be the same 10,280 gpm statistic used in Table 4.5. The startup pond mass-rate balance indicates the potential for contamination of groundwaters beneath the startup pond. The average groundwater consumption (p. 4-3) of 1333 gpm is not found in Figure 4.3 which shows an average well draw of 840 gpm (also p. 4-13). The waste water retention basin inflow of 290 gpm exceeds the outflow of 280 gpm. The radioactive waste treatment system discharge of 5 gpm appears not to be included in Table 4.5 effluents into the Savannah River and may explain the above noted 10,280 versus 10,285 gpm discharge statistics. Inflow into the blowdown sump of 10,420 gpm does not equal the listed outflow of 10,280 gpm. Inflow into VEGP of 300 gpm is not balanced by the accounted 295 gpm outflow. The Figure 4.3 system with monitoring wells should be included on a clearly understood surface location map similar in layout to Figures 4.2 and 4.11.

9. Section 4.3.1.2 Groundwater, P. 4-12. The DES states that the hydraulic head for the deep aquifers is higher than the river and causes communication from the deep aquifers to the river. The DES further states that this head differential allows only upward water transmission which prevents the potential downward migration of contaminants into the underlying aquifers. Both statements are unsubstantiated and predictive. The nearby

Savannah River Plant has made similar predictive statements in the past that have recently been contradicted by data published in the L-Reactor EIS (1984). (2) A higher hydraulic head does not mean nor preclude communication between an aquifer and an overlying surface stream. Transmission pathways established by pressure differentials do not of themselves preclude concentration and gravitational gradient induced contaminant transmissions against the pressure differentials; e.g., transmission rates must be concurrently analyzed.

The DES assumes that the surface marl is an effective containment against downward contaminant migration from released effluents. The DES describes the marl as 60-70 feet thick. The DES assumes the marl is continuous without fracture, without penetration, over 3,169 acres. The DES states that the average groundwater consumption of 1333 gpm (p. 4-3) is drawn from the Tertiary Groundwater System hydraulically connected to the Cretaceous (Tuscaloosa) System. These statements are all predictive and mostly unvalidated. The Savannah River Plant has made similar predictive statements in the past recently controverted by their L-Reactor EIS. (2) The SRP facility has found contamination in its Tuscaloosa wells and gross levels of contamination above the Tuscaloosa aquifer in the ground water table aquifer underlying a surface seepage basin (M-Area basin). (2) In the L-Reactor EIS, the SRP explained the contamination in one Tuscaloosa production water well (well 53-A) by postulating that the pathway was the well itself (via a deteriorating casing), but did not explain the contamination in a second Tuscaloosa production water well (well 20-A); (2) after the May 1984 L-Reactor EIS publication, contamination of a third Tuscaloosa production water well (well 31-A) was discovered in August 1984. (6) The L-Reactor EIS also does not include contamination found in three adjacent Tuscaloosa monitoring wells published in a draft DuPont report (ca. March 1984). (9) The L-Reactor EIS does state that the Tuscaloosa is no longer considered isolated by what was once thought to be impenetrable overlying clay barriers and that there is in theory, no reason why overlying, contaminated groundwater aquifers could not contaminate the underlying Tuscaloosa aquifer. (2) For example, in a discussion of the impact of water withdrawal rates from the Tuscaloosa on the groundwater above the Tuscaloosa aquifer and contaminants the groundwater may hold, the Savannah River Plant stated, "...increased pumping to support [the] L-Reactor...could increase the tendency for contaminants already present in the groundwater to move downward." (2, p. 5-17)

The DES makes its assumptions on a limited, poorly defined well drilling and monitoring program. Models and subsequent predictions based on those assumptions are then made. The logic becomes irrefutable, based on those assumptions. The Savannah River Plant made similar predictions since proven fallacious. The DES assumptions cannot be disproven until surface released contaminants from VEGP also enter the drinking water and are subsequently discovered. (2,6,10)

Without a detailed presentment of groundwater flow paths, the DES expands on the impervious marl assumption by predicting that all downward migrating contaminants will outcrop in stream channels bounding Vogtle. The DES logically concludes "...that the water table aquifer is hydraulically isolated on an interfluvial high..." This conclusion is inescapable, based on the assumptions leading to the conclusion. The DES plots predicted contaminant flow paths and a "...probable discharge point of potential contaminants percolating into the water table aquifer beneath the plant site." (p. 4-12) At the Savannah River Plant, the (M-Area) Tuscaloosa aquifer contamination occured approximately underneath the percolating contaminants and underneath the liquid waste storage tank. (9)

10. <u>Section 5.3.2 Water Quality</u>. The effluent released to the Savannah River will exceed the pH criteria of 8.5 established for a "fishing" classification (p. 5-6). See Table 4.5 Explain.

11. <u>Section 5.3.2.4 Radiological Effects</u> The DES assumes that the marl underlying VEGP is impermeable and will trap radioactive effluents migrating from the auxiliary building basement from a ruptured recycle holdup tank. The highest levels of M-Area migrating contaminants measured at the Savannah River Plant were directly underneath a solvent storage tank that had not ruptured but had been in service about 25 years. (9) The marl-clay barriers underneath this SRP solvent tank were similarly considered impermeable, but contamination has been found in drinking water production wells drawing water from the deep Tuscaloosa aquifer. (2,6,10)

12. Section 5.5.1.1 Cooling Tower Operation The DES states that VEGP cooling tower effluent concentrations are equivalent to the circulating water characteristics. Item 5 above noted that the VEGP combined effluent release characteristics appear to exceed DWS standards for at least four characteristics including iron, mercury, lead, and chromium; the circulating water characteristics are at least equivalent to the combined effluent released to the Savannah River, but in addition, some are higher, e.g., TDS and TSS, although blowdown reconcentration is a factor (p. 5-106). At the Savannah River Plant, tritium release stacks are downwind (the prevaling wind) 2 km to the SRP radioactive waste burial ground, yet the background groundwater tritium concentration under the SRP burial ground is approximately the averaged airborne tritium concentration released from the SRP tritium stacks.(10) SRP airborne tritium releases have taken place over a thirty year period and can be assumed to approximate a steady state airborne release source to the groundwater underlying the SRP burial gound; the SRP burial ground groundwater can be assumed to approximate a steady state sink. (10)

Vogtle cooling tower airborne release concentrations are considered to be equivalent to circulating water concentrations that may exceed EPA drinking water standards (DWS). Considering the SRP tritium airborne releases and consequent groundwater concentrations of tritium, steady state cooling tower effluent depositions may similarily exceed acceptable DWS standards within a large radius of the release points. The DES verifies its conclusions regarding the acceptability of the releases based on literature searches and modeling studies; the Savannah River Plant literature and SRP models referenced by the DES have reached similar conclusions in the past, conclusions since proven false; (2,6,10) e.g., a tritium groundwater radionuclude predicted travel time of 200 years to migrate from the SRP burial ground to the first outcrop can be compared to the actual 25 years it took the tritium to migrate. (3,6) Modeling studies unvalidated by operational field tests equivalent to the VEGP operating conditions should be rejected. VEGP long-term well-monitoring should network the plant to validate and to correct DES predictions. The VEGP well-montoring network should be independently peer reviewed.

13. Section 5.9 Radiological Impacts Radiological releases and doses from VEGP are estimated based on models. Savannah River Plant releases and doses are mostly estimated with estimates improved by feedback from the SRP radiological monitoring network. The DES does not consider cumulative radiological effects from VEGP and SRP. No validation of the radiological release models are identified. Error bars are used to reflect DES uncertainty ranges, but the uncertainty may be due to mathematical uncertainties uncorrelated to actual conditions. For example, the Savannah River Plant predicts SRP airborne radiological releases will increase with the L-Reactor on line in 1985 and further predicts that the maximum tritium concentration in milk at the 17 km SRP plant boundary will then be 3.9 E3 pCi/L (3.9 E3 is read as 3,900); maximum I-131 in milk at the SRP 17 km

plant boundary to be 1.1E-2 pCi/L; and maximum Sr-90 in river water below the SRP plant to be 6.7E-2 pCi/L. (2, p. 5-52) The actual 1982 maximums were: tritium at 5400 pCi/L (northwest 35 km from SRP plant center: 24 milk samples at Langley, SC; mean 1400 pci/L; 2 std. dev. at +/- 2600 pCi/L), I-131 at 5.2 pCi/L (south about 25 km from SRP center; milk samples from Girard, GA; mean 4.7 pCi/L; 2 std. dev. +/- 5.6 pCi/L) and Sr-90 in river water at 0.73 pCi/L (offplant at station R-10 Highway 301) and Sr-90 in milk at 14 pCi/L (southwest 45 km from SRP plant center; 3 milk samples at Waynesboro, GA; mean at 7.5 pCi/L; no calculated std. dev.). (11) In this example, SRP slightly underestimated the maximum tritium release, underestimated the maximum I-131 release by two orders of magnitude, and underestimated the maximum Sr-90 release for river water adjacent to the plant by one order of magnitude. Of more importance, these underestimations by SRP were predicted at a 17 km distance under increased release conditions whereas actual readings for tritium were 18 km further out and for I-131 were 8 km further out against the predominant wind vector. The Sr-90 river water prediction and sample location were the same, however, the Sr-90 milk reading was 28 km further out from the SRP plant boundary against the predominant wind vector but parallel to the second maximum prevailing wind direction. Considering wind and distance distribution effects, that the predictions are based on a higher radioactive effluent release rate than that currently released, the already underestimated SRP predictions could be magnified by one to three more orders of magnitude. A different analysis of the predicted DuPont releases using SRP tritium burial ground background concentrations, PAR pond tritium concentrations (a large pond at the SRP facility), SRP boundary air moisture concentrations, and a single data point for kr-85 concentrations at 300 km concluded that SRP releases for tritium and krypton-85 may be low by as many as five orders of magnitude. (10)

The DES should reflect these actual circumstances. The DES should discuss cumulative effects. This same SRP literature is referenced in the DES. The existing radiological burdens from the Savannah River Plant should be reflected in the DES since VEGP releases will add to those burdens, both for radiological and non-radiological releases. The DES relies on the open literature and models but does not discuss validation. Actual circumstances at the SRP belie the SRP literature and SRP models and may do the same for the DES. (6,10) In the instance of Sr-90 in milk 45 km from the SRP release point, the Sr-90 level exceeds the 8pCi/L EPA drinking water standard for Sr-90. (6,11) The SRP dose calculations are predicted and are based on the much lower, calculated releases ignoring SRP's own published data. (2,6)

The DES has not published accessible air quality concentrations at the stack points and distances from plant center. The DES does rely on XOQDOQ type calculations (p. 5-35) for accident analyses. These are similar to SRP calculations found to be largely underestimated above. (2,6,10) XOQDOQ is a gaussian distribution plume model for stack released contaminants and accounts for meteorological conditions and distances from the release point. (10) The DES notes that the "...cause-and-effect relationship between radiation exposure and adverse health effects are quite complex...[but] they have been studied extensively." (p. 5-36) XOQDOQ is representative of the mathematical complexities involved, but XOQDOQ makes many assumptions not readily discernible to the uninformed and not easily validated. (10) Einstein noted that "as far as the laws of mathematics refer to reality, they are not certain; and as far as they are certain, they do not refer to reality." (12) XOQDOQ is not reality, nor are the physicochemical models used to predict reality, but the tritium concentrations in the milk at Langley, SC, the I-131 concentrations in milk at Girard, GA, the Sr-90 river water concentrations beneath the SRP, and the Sr-90 concentrations in milk at Waynesboro, GA, are samples of reality, samples collected by the SRP plant's prime contractor DuPont, samples significantly underestimated by the SRP physicochemical predictive models, models of similar process and of equivalence to the DES models.

14. Locate water table aquifer divides on a clear VEGP surface map.

15. The DES should list and discuss the possible sources of surface chemical and radiological contamination to the groundwater underlying VEGP, e.g., the concrete basins, sediment ponds, startup pond, etc.

16. The topographic map of VEGP appears to indicate that VEGP is not necessarily on an interfluvial high bounded on all sides by stream channels but that channels appear to cut into the site at various angles and appear to only partly bound the site. Explain.

17. Tuscaloosa piezometric contours should be provided and the predicted flow path in the Tuscaloosa provided. Scale should allow a comparison of the Savannah River Plant data also. A comparison with the SRP data would provide timely assistance.

18. The DES should include a summary description of each well construction type (e.g., make-up well, test well, confined aquifer observation well, unconfined aquifer observation well, etc.). Observation well/surface water monitoring techniques should be discussed (by well and surface water type if different), e.g., sample collection, nuclides analyzed, sampling periods, assay organizations, and standards.

19. Closed and/or abandoned wells should be precisely located on a surface map and well closure sealing techniques should be discussed.

20. Table 2.4.12-7 FSAR, lists at least three confined aquifer wells abandoned due to the proximity of construction, possibly underneath construction. Precisely locate all wells abandoned and relate to all VEGP construction. As at the SRP, these

wells may be the weak link in the underlying, protective marl, a pathway for contaminants to enter the confined aquifer (cf. L-Reactor EIS, discussion on well 53-A, p. F-99). (2) Discuss.

21. The FSAR appears to indicate piezometric and well water level differences in all wells. Discuss the marl mapping techniques and the number of wells in the mapping. Discuss uncertainties involved. If the marl is absent under the Savannah River Plant, discuss the basis of that determination. Marl wells 42B/C showed varying water heights from water drawn from within the marl yet the marl is still considered an aquiclude. Explain.

The VEGP power block excavation exposed an upper 25 feet of marl with a surface area of about one million square feet exposed, approximately 1/3 of 1% of the VEGP site. Provide the uncertainty ranges in asserting that no voids, dissolution cavities, systematic fractures, or joints (exclusive of the multiple penetrations thru the marl by confined aquifer observation and production wells) exist that would provide a path for movement of ground water through the marl over the full 3,169 acre site. Provide the uncertainty ranges inclusive of the marl multiple well penetrations.

Discuss the consistently large water level well differences in light of the lack of correlation between the active, confined aquifer observation well water levels.

Provide laboratory permeability tests conducted on core samples from marl exploration holes; provide core sampling techniques, core sample depth, core sample location and other pertinent data. Provide field test correlations for the same core sample locations.

The VEGP has stated the marl depth is 130 feet below the surface. Confined aquifer well 34 does not appear to support this contention. Which wells do and which do not? Why was well 34 located in the river flood plan? Well 34 appears to be on the VEGP site (FSAR Figure 2.4.12.6) and appears to contradict the VEGP argument about the VEGP site being located on an interfluvial high. Provide a detailed explanation of where the VEGP interfluvial high is theoretically intact and not intact and relate to the VEGP geography over the entire surface of the plant site and to the marl underlying VEGP. Explain where the marl boundaries are located.

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