May 21, 2010

Mr. Joseph A. (Buzz) Miller
Executive Vice President
Southern Nuclear Operating Company
P.O. Box 1295
Birmingham, AL 35201-1295

SUBJECT: VOGTLE ELECTRIC GENERATING PLANT ESP SITE - ISSUANCE OF EXIGENT AMENDMENT RE: REQUEST FOR CHANGES TO THE SITE SAFETY ANALYSIS REPORT

Dear Mr. Miller:

The U.S. Nuclear Regulatory Commission (NRC, the Commission) has issued the enclosed Amendment No. 1 to Early Site Permit No. ESP-004 for the Vogtle Electric Plant Early Site Permit (ESP) Site. The amendment consists of changes to the Site Safety Analysis Report in response to your application dated April 20, 2010, as supplemented on April 23 and 28, May 5, 10, 13, and 20, 2010. The NRC staff has reviewed your request for an exigent amendment and concluded that the request meets the standard in 10 CFR 50.91(a)(6) for exigent circumstances.

The amendment revises Vogtle Electric Plant ESP Site Safety Analysis Report (SSAR) to allow the use of Category 1 and 2 backfill material from additional onsite areas that were not specifically identified in the VEGP ESP SSAR as backfill sources for the activities approved under the ESP and Limited Work Authorization. This amendment only approves the subset of onsite locations identified in your May 13th request for a limited scope approval pending the NRC determination on the remainder of the borrow sources identified in the license amendment request.

This amendment is being issued under exigent circumstances in accordance with 10 CFR 50.91(a)(6). The exigent circumstances and final no significant hazards considerations are addressed in Sections 4.0 and 5.0 of the enclosed Safety Evaluation.

The Notice of Issuance will be included in a future *Federal Register* notice.

Sincerely,

/RA/

Chandu Patel, Senior Project Manager
AP1000 Branch 1
Division of New Reactors Licensing
Office of New Reactors

Docket No. 52-011

Enclosures:
1. Amendment No. 1 to ESP-004
2. Safety Evaluation

cc w/encl: Distribution via Listserv

This amendment is being issued under exigent circumstances in accordance with 10 CFR 50.91(a)(6). The exigent circumstances and final no significant hazards considerations are addressed in Sections 4.0 and 5.0 of the enclosed Safety Evaluation.

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SOUTHERN NUCLEAR OPERATING COMPANY

VOGTLE ELECTRIC GENERATING PLANT ESP SITE

DOCKET NO. 52-011

AMENDMENT TO EARLY SITE PERMIT AND LIMITED WORK AUTHORIZATION

Amendment No. 1
Early Site Permit No. ESP-004

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The request dated May 13, 2010, for a “limited scope approval” of the application for amendment submitted by Southern Nuclear Operating Company, on behalf of itself and Georgia Power Company, Oglethorpe Power Corporation, Municipal Electric Authority of Georgia, and the City of Dalton, Georgia (the ESP holders), dated April 20, 2010, as supplemented on April 23, 28, May 5, 10, 13, and 20, 2010, complies with the applicable standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's regulations;

   B. There is reasonable assurance that the facility will be constructed and will be operated in conformity with the license, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the ESP holders are authorized to revise the Site Safety Analysis Report (SSAR) as set forth in the ESP holders' request dated May 13, 2010, for a limited scope approval of the application dated April 20, 2010, as supplemented on April 23 and 28, May 5, 10, 13, and 20, 2010, to allow the use of specified onsite backfill borrow areas that were not previously identified in the SSAR. The ESP holders shall update the SSAR by adding these changes, as authorized by this amendment.

3. This license amendment is effective as of its date of issuance and shall be implemented within 15 days.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Jeffrey Cruz, Chief
AP1000 Branch 1
Division of New Reactors Licensing
Office of New Reactors

Attachment:

Date of Issuance:

SAFETY EVALUATION BY THE OFFICE OF NEW REACTORS

RELATED TO AMENDMENT NO. 1 TO EARLY SITE PERMIT NO. ESP-004

SOUTHERN NUCLEAR OPERATING COMPANY

VOGTLE ELECTRIC GENERATING PLANT ESP SITE

DOCKET NO. 52-011

1.0 INTRODUCTION

By letter dated April 20, 2010 (Reference 1), as supplemented by letters dated April 23, 2010 (Reference 2), April 28, 2010 (Reference 3), and May 5, 2010 (Reference 4), May 10, 2010 (Reference 5), and May 13, 2010 (Reference 6), Southern Nuclear Operating Company (SNC) ("applicant"), on behalf of itself and Georgia Power Company, Oglethorpe Power Corporation, Municipal Electric Authority of Georgia, and the City of Dalton, Georgia, submitted a request to amend the Early Site Permit (ESP) and Limited Work Authorization (LWA) that was issued to SNC and the same co-applicants on August 26, 2009, for the Vogtle Electric Generating Plant (VEGP) site (Reference 7). In particular, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 52.39(e), the applicant seeks to amend the ESP Site Safety Analysis Report (SSAR) (Reference 8) to allow the use of Category 1 and 2 backfill material from additional onsite areas that were not specifically identified in the VEGP ESP SSAR as backfill sources for the activities approved under the ESP LWA. The requested changes are based on the fact that actual excavation from the three previously identified borrow areas (the Units 3 and 4 power block area, the switchyard area, and Borrow area 4) has yielded significantly less Category 1 and 2 backfill material than predicted, resulting in a shortfall of available Category 1 and 2 backfill for the VEGP site. Therefore, additional sources at other onsite locations outside of the three specified borrow areas are needed to proceed with the previously-authorized LWA construction.

By letter dated May 13, 2010, the applicant requested that the NRC consider issuing a limited scope approval (LSA) of a subset of onsite locations pending the NRC determination on the remainder of the borrow sources identified in the license amendment request (LAR). As described in the application, the borrow areas included in the LSA are limited to the cooling tower; temporary parking; temporary warehouse, office, laydown; and spoils areas. By letter dated May 20, 2010, the applicant corrected a typographical error in the text of the LSA request: its reference to "Section 4.3" should have been to "Table 4.3." This safety evaluation (and Amendment 1) encompasses only the change to the SSAR defined in the LSA request. The NRC staff will prepare a separate safety evaluation to document its determination on the remaining backfill sources encompassed by the LAR. Accordingly, this safety evaluation's references to "the application" and "the LSA" should be understood as referring only to the portions of the LAR supporting the LSA, rather than to the entire LAR.

Pursuant to Section 50.91(a)(6) of Title 10 of the *Code of Federal Regulations* (10 CFR), SNC requested that the proposed amendment be issued under exigent circumstances because safety related construction activities will be halted when deposits of Category 1 and 2 backfill material are exhausted. The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed SNC's request for an exigent amendment and concluded that the request meets the standard in 10 CFR 50.91(a)(6) for exigent circumstances. A detailed explanation of the exigent circumstances is contained in Section 4.0 of this safety evaluation.

The supplements dated May 5, 10, and 13, 2010, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the NRC staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on May 6, 2010 (75 FR 24994).

2.0 REGULATORY EVALUATION

10 CFR 52.39, "Finality of early site permit determinations," states that the holder of an ESP may not make changes to the ESP, including the SSAR, without prior Commission approval in the form of an application for a license amendment.

10 CFR Section 100.23, "Geologic and Seismic Siting Criteria," provides the nature of the investigations required to obtain the geologic and seismic data necessary to determine site suitability and identify geologic and seismic factors required to be taken into account in the siting and design of nuclear power plants.

10 CFR Part 50, Appendix A, GDC 2, "Design Bases for Protection Against Natural Phenomena," relates to the consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding area, with sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated.

In addition, in accordance with the guidance of NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," the determination of geologic characteristics and subsurface material properties for this ESP License Amendment should be consistent with appropriate sections from Regulatory Guide (RG) 1.28, "Quality Assurance Program Requirements (Design and Construction)"; RG 1.132, "Site Investigations for Foundations of Nuclear Power Plants"; RG 1.138, "Laboratory Investigations of Soils for Engineering Analysis and Design of Nuclear Power Plants"; and RG 1.206, "Combined License Applications for Nuclear Power Plants (LWR Edition)."

3.0 TECHNICAL EVALUATION

To perform the technical evaluation, the NRC staff considered Vogtle ESP SSAR Section 2.5.4 and focused on Sections 2.5.4.5.3, "Backfill Design"; 2.5.4.5.4, "Backfill Sources"; and 2.5.4.5.5, "Quality Control and ITAAC." The staff also examined the portions of NUREG-1923, "Safety Evaluation Report for an Early Site Permit (ESP) at the Vogtle Electric Generating Plant (VEGP) Site" (U.S. NRC, 2009) (FSER) documenting the staff's technical evaluation of those aspects of

the ESP and LWA application (Reference 9). The staff reviewed the LSA to evaluate the impact of the requested SSAR changes on the stability and safety foundations and structures to be constructed on the Vogtle site.

Under the LSA, the applicant proposed to add the following paragraph, along with new Table 2.5.4-15 ("Criteria for Evaluation of Borrow Material from Outside the Three Designated Category 1 Borrow Areas"), to SSAR Section 2.5.4.5.4, "Backfill Sources":

> Other localized deposits of suitable material within the Barnwell Group of the Upper Sand stratum located within the VEGP Exclusion Area Boundary (EAB) (Figure 1-4) outside of the above three borrow areas may be evaluated for use as borrow material. These additional borrow areas are limited to selected areas identified in NUREG 1872, Vol. 1, "Final Environmental Impact Statement for an Early Site Permit (ESP) at the Vogtle Electric Generating Plant Site," Section 4.3, as areas impacted by Vogtle 3 and 4 construction. These selected areas are described in NUREG 1872 as follows:
> - Cooling Tower
> - Temporary Parking
> - Temporary Warehouse, Office, and Laydown
> - Spoils Areas
>
> Deposits within these areas may be identified by review of existing boring data, additional informational borings or test pits, or excavation activities incidental to construction. The evaluation to use such material would include a geologic review of the materials, a laboratory testing program, and an engineering review of soil properties. This material would be designated as suitable for use as Category 1 and 2 backfill provided the evaluation concludes that the material meets the acceptance criteria contained in Table 2.5.4-15. Once identified as suitable backfill, the material will be qualified and placed in accordance with all requirements for Category 1 and 2 backfill.

As noted above, by letter dated May 20, 2010, the applicant corrected its reference to "Section 4.3" to read "Table 4.3." During the review, the staff applied the guidance of 10 CFR Part 50, Appendix A and 10 CFR 100.23, as well as relevant regulatory guides, with references to related industrial standards, and the same criteria that were used to approve the Vogtle ESP and Limited Work Authorization (LWA) as presented in NUREG-1923. In particular, the staff's technical evaluation focused on verifying whether or not backfill soil from the proposed new borrow areas has the same material characteristics and engineering properties to ensure that all backfill-related design parameters can be met and that there will be no negative impact on the stability of subsurface materials and foundations at the site.

The LSA states that the qualified Category 1 and 2 backfill soil may be obtained from the cooling tower; temporary parking; temporary warehouse, office, and laydown; and spoils areas within the VEGP Exclusion Area Boundary (EAB). Although the SSAR Figure 1-4, "Site Layout – New Development," illustrated the EAB, the applicant provided Figure 1, "Map Showing Extent of Barnwell Group," in Attachment 2 to the letter dated April 28, 2010, to provide more details of the EAB boundary, as well as a geologic map of the site. In its review of this request, the staff considered that the VEGP site is well studied and its geological features are well known based on information submitted by SNC in its amendment request, as well as from the information

previously submitted to the NRC. This previously-submitted information includes site investigations performed for the licensing of the currently-operating units at the VEGP site (VEGP Units 1 and 2), for issuance of the VEGP ESP and LWA, and in support of the pending combined license (COL) application for Units 3 and 4. The staff also considered information provided in the U.S. Geological Survey Professional Publication 1603 (USGS,2001, Reference 10).

In support of its ESP and COL applications, the applicant conducted field and laboratory tests for selected subsurface layers that covered most of the site. These tests provided sufficient data to determine the properties of the subsurface materials of the upper portion of the Barnwell Group within the Upper Sand stratum occurring within the EAB. As defined by the applicant in SSAR Section 2.5.4 and shown in SER Figure 1 (modified from SSAR Figure 2.5.1-8), the Upper Sand stratum includes geologic formations of the Barnwell Group, as well as several other formations.

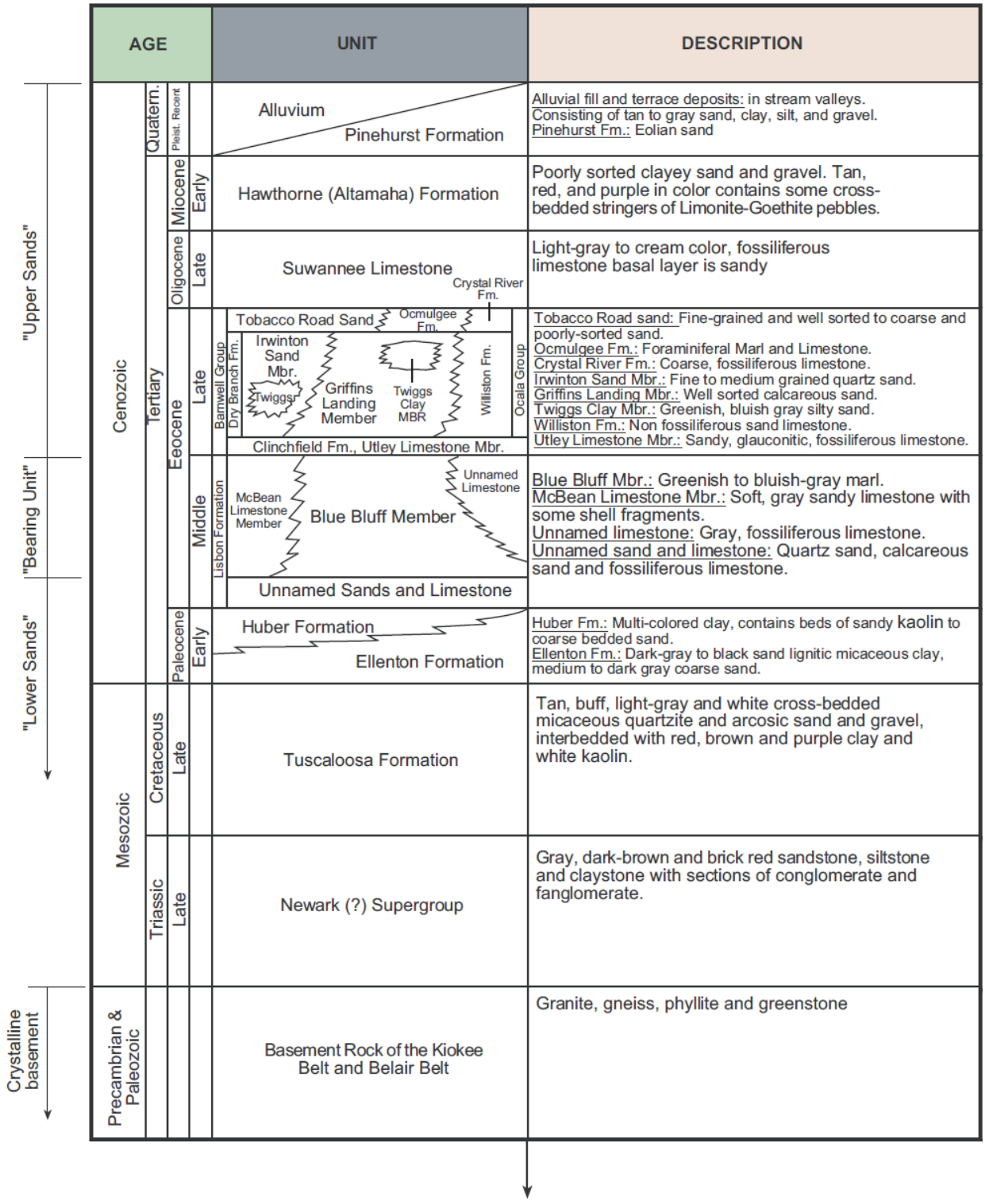

Figure 1. Nomenclature of Vogtle Site Subsurface Strata (from SSAR Figure 2.5.1-8)

For determining the adequacy of the LSA proposed backfill borrow areas for use as Category 1 or Category 2 backfill, the staff considered geological characteristics, soil material properties, and backfill soil engineering, including static and dynamic properties. The staff's technical evaluation is summarized below.

3.1 Geological Characteristics and Geological Origin of the Proposed Borrow Areas

It is critical that the geological characteristics of the LSA proposed borrow areas be similar to those characteristics specified in the ESP SSAR and approved by the NRC to confirm that the soil in the proposed areas will have the same, or similar, material and engineering properties as that in the areas previously specified in the SSAR. Because spatial variability of the subsurface material is expected, and may be significant even over very short distances, if the geological characteristics of the proposed borrow areas are not the same as the three previously defined borrow areas, then different types of soil (i.e., soil with different mineral composition and material properties) may exist in the new borrow areas. Even if a different type of soil could be qualified as Category 1 and 2 backfill material based on grain size distribution, compaction and all other static engineering properties, the dynamic properties, especially the soil degradation properties, may be significantly different from that of the backfill soil obtained from the SSAR-specified borrow areas. Since all backfill soil will be taken from formations comprising the upper portion of the Barnwell Group that occur within the Upper Sand Stratum as defined in the SSAR, the staff focused the technical evaluation on determining whether or not these Barnwell Group formations extend across the site and exhibit consistent geological characteristics.

Based on the descriptions in SSAR section 2.5.1.2.3.2 and additional information provided in Attachment 2 to the letter of April 28, 2010, "Geological Assessment – Extent and Distribution of Barnwell Sediments at the VEGP Site," the Barnwell Group consists of the Clinchfield (including the basal Utley Limestone member) and Dry Branch Formations and the Tobacco Road Sand. The upper part of the Barnwell Group consists predominantly of quartz sands, silty sands, and clayey sands with occasional clay seams, soft zones, and shell zones. The quartz sands range from fine to coarse grained and are moist and dense. Soil color in the upper portion of the Barnwell Group formations, predominantly red with zones of yellow, orange, lavender, and purple, is imparted by clay coatings on the sand grains of the formations. Sands in the upper part of the Barnwell Group were identified by the applicant as a candidate for Category 1 and 2 backfill soil. The applicant did not include the lower portion of the Barnwell Group as a potential backfill source because of lithologic variations. Based on the previous site investigations for VEGP Units 1 and 2 and the site investigations conducted for the Units 3 and 4 ESP and COL applications, as well as information provided in U.S. Geological Survey Professional Publication 1603 (USGS, 2001), the applicant stated that the Barnwell Group ranges in thickness from slightly less than 30.5 m (100 ft) north of the site to greater than 61 m (200 ft) south of the site.

To demonstrate that the Barnwell Group extends across the VEGP site, SNC supplied two figures in Attachment 2 to its RAI Response letter dated April 28, 2010. Figure 1 ("Map Showing Extent of Barnwell Group") illustrates the extent of the Barnwell Group within the EAB and the surrounding area. Figure 2 ("Vogtle Plant Area General Stratigraphic Column") provides a stratigraphic column containing descriptions of the geological characteristics of the Barnwell Group. In Attachment 3 of the letter, the applicant provided additional test pit and

boring logs that are not from the original three borrow areas identified in the SSAR to support the conclusion that the Barnwell Group extends throughout the VEGP site.

The staff reviewed SSAR section 2.5.1.2.3.2, SNC's letter dated April 28, 2010, including Attachments 2 and 3, and other available information, and compared the newly submitted test pit and boring logs with those from the three borrow areas specified in the original SSAR (borings B-1108, B-1117, B1121, B1194 and B-1197). The staff finds that:

1. All test pit and boring logs from the three areas originally specified in the SSAR, as well as the unspecified areas of the VEGP Units 3 and 4 site within the EAB, showed similar geological characteristics, especially for the Barnwell Group portion of the Upper Sand stratum.

2. The soil from different borings and test pits showed similar yellowish brown, tan, and reddish-brown colors.

3. The sands within the Upper Sand stratum, especially in the upper portion of the Barnwell Group, have similar standard penetration test (SPT) N-count values ranging from about 20 to 35 blows per foot.

4. The specific gravity of the Upper Sand stratum soil has similar values ranging from 2.69 to 2.75.

Based on these findings, the staff concludes the following:

1. Site investigation data, particularly the test pit and boring logs, confirm that the Barnwell Group extends into the cooling tower; temporary parking; temporary warehouse, office, and laydown; and spoils areas within the EAB at the VEGP site.

2. Sands in the Upper Sand stratum, especially in the upper portion of the Barnwell Group, contain a similar type of soil. These sands are noncalcareous, suggesting that the main mineral component of the soil is quartz sand, rather than sands derived from soils developed from limestone.

3. The specific gravity of Upper Sand stratum soil is greater than 2.65, a typical value for natural quartz sand. This specific gravity value is another indication that sands in the Barnwell Group are quartz-rich, and not derived from carbonate rock units, which would have a lower specific gravity.

4. Similar SPT N-values obtained from the upper portion of the Barnwell Group within the Upper Sand stratum across the site indicate that the sands in the upper part of the Barnwell Group are similar.

5. The color of the soil observed from all test pits and boring samples indicated that the mineral composition of the fines in the upper portion of the Barnwell Group of the Upper Sand stratum is similar.

In summary, the staff agrees that, with some variation from area to area, the geological characteristics of the upper portion of the Barnwell Group within the Upper Sand stratum are consistent with the description of the Barnwell Group sediments across the site, and the upper portion of the Barnwell Group of the Upper Sand stratum contains the same type of sand as that which was previously approved for use as Category I and II backfill material.

3.2 Soil Material Properties in the Soil Layer of Proposed Borrowing Areas

The site investigation data showed that the upper portion of the Barnwell Group within the Upper Sand stratum consists predominantly of quartz sands with varying amounts of silt and clay. Soil material properties are defined mainly by soil classification and grain size distribution (or soil gradation). As specified in the ESP SSAR, the classification of the soil that may be used for Category I and II backfill includes poorly graded sands (SP), silty sands (SM), and silty to poorly graded sands (SP-SM), and the soil gradation property is defined in SSAR Table 2.5.4-14 and associated text in Section 2.5.4.5.3. Based on the available field investigation data presented in the ESP SSAR and the proposed ESP License Amendment and its supplements, the staff finds that the soil in the upper portion of the Barnwell Group within the Upper Sand stratum in the LSA proposed areas onsite contains soil with the same soil classification originally approved in the ESP SSAR. In addition, the available test pit and boring logs show that the fines content for these sands ranges from 2 to 40 percent, indicating that the sands in the LSA proposed areas will meet the soil gradation requirements as delineated in the staff's approval of the ESP LWA, which include fines content ranging from 3 to 25 percent.

3.3 Soil Engineering Properties of Qualified Category 1 and 2 Backfill from Proposed Borrow Areas

The Category 1 and 2 backfill soil is designed to have, with at least 95% modified Proctor compaction, the following engineering properties: drained internal angle of friction of 36°; shear wave velocity of 1,000 fps at and below the nuclear island foundation level; designed backfill soil degradation properties developed from resonant column torsional shear (RCTS) testing of COL samples; shear modulus reduction curves as specified in SSAR Table 2.5.4-12a and Figure 2.5.4-9a; and damping curves as specified in SSAR Table 2.5.4-12a and Figure 2.5.4-11a.

Considering that the engineering properties of backfill soil are determined mainly by soil type and grain size distribution, as well as the degree of compaction, the staff finds that:

1. Since the soil type is determined to be quartz-dominated sands with some silt and clay, and this soil type extends to the LSA proposed areas within the EAB as described above, the condition for obtaining qualified backfill soil from onsite areas other than those originally specified in the SSAR can be met by SNC.

2. The Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) specified in SSAR Section 2.5.4.5.5 will ensure that the Category 1 backfill soil placed in-field will meet the requirements of a minimum of 95% modified Proctor compaction; and the shear wave velocity at and below the NI foundation depth is greater than or equal to 1,000 fps. Furthermore, the SSAR specifies that the Category 2 backfill will also be compacted to a

minimum of 95 percent of modified Proctor compaction, have a shear wave velocity of 1,000 fps, and meet other criteria specified for Category 1 backfill.

3. It is well-established that the internal friction angle for well compacted sand is generally greater than 40° (Reference 11).

4. The Category 1 and 2 backfill soil degradation properties were developed from the RCTS tests using samples from the SSAR-specified borrow areas when applying for an ESP/LWA license, and the test results covered certain ranges of the uncertainties and variability of soil material and engineering properties. For example, the specimens used in testing were collected from five different locations. During the tests, the samples were compacted at 95, 97 and 100 percent, and the dry density values ranged from 105.8 to 113.8 pcf for 95% compaction, 106.6 to 112.7 pcf for 97% compaction, and 113.0 to 120.4 pcf for 100% compaction. Since the dry density value is not only related to compaction, but is also an indicator of the particle component of the soil, the dry density data show a variation in the soil used in the suite of the RCTS tests. Since as discussed above the material in the upper portion of the Barnwell Group within the Upper Sands stratum is geologically similar throughout the site, the dynamic properties of material obtained from the additional borrow sources would be expected to fall within the variability previously evaluated by the staff as part of the ESP review.

Based on the findings stated above, because of the similar geologic characteristics of the Barnwell Group across the VEGP EAB, the same type of soil from the onsite areas identified in the LSA request containing the upper portion of the Barnwell Group to be used as backfill material must meet the soil grain size distribution requirement to be qualified as Category 1 and 2 backfill and meet the minimum 95% field compaction requirement; and, because the backfill soil dynamic properties determined from the RCTS tests covered a range of variability, the staff concludes that it has reasonable assurance that the as-built Category 1 and 2 backfill soil borrowed from the onsite areas identified in the LSA request will have the same, or similar, soil static and dynamic properties as that from the three previously identified areas. Furthermore, the applicant specified acceptance criteria to ensure that the as-built backfill will meet the design requirements specified in the SSAR.

3.4 Impacts of the Proposed Change on Hydro-geologic Analysis

The applicant noted in its April 20, 2010, letter that the hydro-geologic analysis in Vogtle ESP SSAR Sections 2.4.12 and 2.4.13 is unaffected by the LAR because the backfill materials from the designated borrow areas are the same geological deposit assumed in the previous analysis.

The April 20, 2010, letter states that the backfill materials from the designated areas are from the same geological deposit assumed in the previous radiological consequence analysis in SSAR Section 2.4.13. Because the materials are from the same Barnwell Formation Group, the staff concludes that the hydro-geological properties of the backfill materials are unchanged. Moreover, the consequence analysis in the ESP SSAR considered hydro-geologic properties (hydraulic conductivity, porosity, etc.) of the backfill materials without assuming compaction of the backfill. The proposed compaction after backfill will add conservatism to the radiological consequence analysis due to more contaminant travel times through the backfill materials.

The SNC letter dated May 5, 2010, states that while the Barnwell Formation Group includes the Water Table Aquifer, all borrow excavations to date have been done well above the Water Table Aquifer and that further excavation for borrow materials will remain above the Water Table Aquifer. The letter also states that all borrow areas will be redressed after excavation based on a site-specific Erosion Sedimentation and Control Plan under the Georgia General NPDES Permit rule. This plan includes re-vegetation of disturbed areas to minimize future erosion. These statements are identical to the conditions assumed in the previous hydro-geologic analysis in SSAR Section 2.4.13.

In summary, the borrow material properties, excavation depths, and the condition of re-vegetation are unchanged from those considered in the initial analysis in ESP SSAR Section 2.4.13. Therefore, the staff concludes that the hydro-geologic analysis in ESP SSAR is not affected by the LSA proposed change.

3.5 Summary of NRC Staff Evaluation

The NRC staff has reviewed the LSA request to amend Vogtle ESP SSAR Section 2.5.4. Based on the staff's technical evaluation, and applying the same criteria for approving Category 1 and 2 backfill material used for approving the three borrow areas specified in the original ESP SSAR, the staff concludes that:

1. The geologic origin of the upper portion of the Barnwell Group within the Upper Sand Stratum is the same within the VEGP EAB, and that all available data confirm similar geologic characteristics of the Barnwell Group in the cooling tower; temporary parking; temporary warehouse, office, and laydown; and spoils areas within the VEGP EAB.

2. The soil that exists in the upper portion of the Barnwell Group is identified as the same type of soil with similar mineral components and material properties as that previously approved for use as Category 1 and 2 backfill in the VEGP ESP.

3. The four areas proposed in the LSA request, where the Barnwell Group is clearly defined within the VEGP EAB, as illustrated in Figure 1 "Map showing Extent of Barnwell Group" of Attachment 2 to the April 28, 2010, letter, can be used as potential borrow sources for Category 1 and 2 backfill material from the Upper Sand Stratum.

4. By applying the criteria specified in the SSAR and in proposed License Amendment Table 2.5.4-15, and carrying out the quality control program, ITAAC, and other testing specified in SSAR Section 2.5.4.5.5, the staff expects that the engineering properties (both static and dynamic), of the qualified backfill soil from the LSA-proposed onsite borrow areas will be the same as, or similar to, those of the Category 1 and 2 backfill soil from the three borrow areas previously characterized, and will, therefore, meet the design requirements.

5. The hydro-geologic analysis in the ESP SSAR Section 2.4.13, radiological consequence analyses from accidental effluent releases, is not affected by the LSA proposed change.

For the reasons specified above, the staff finds that the onsite cooling tower; temporary parking; temporary warehouse, office, and laydown; and spoils areas identified in the LSA Request are acceptable as potential sources for Category 1 and 2 backfill as described in the VEGP ESP SSAR.

4.0 EXIGENT CIRCUMSTANCES

The Commission's regulations at 10 CFR 50.91 contain provisions for issuance of amendments when a licensee and the Commission need to act promptly and time does not permit the usual 30-day public notice period. Pursuant to 10 CFR 50.91(a)(6), SNC requested that the proposed amendment be issued under exigent circumstances because safety-related construction activities will be halted when available deposits of Category 1 and 2 backfill material is exhausted by May 23, 2010. SNC further stated that suspension of backfill operations prior to reaching the 180 feet msl elevation could have adverse effects on safety and the environment due to the potential for erosion and other environmental damage during delays in operations. SNC described the effects of delayed issuance of the amendment as including possible backfill rework, the potential loss of available qualified fill (contributing to the identified shortage), and the loss of efficiency in backfill placement. SNC also stated the following:

> In addition, the inability to use backfill from the additional areas could cause a disruption in the construction schedule for the project. Vogtle 3 and 4 operations are supporting a staff of over 900 people. Any significant delays would require curtailing operations and reinitiating operations at a later time. There are significant economic costs associated with the schedule and staffing impacts.

The NRC staff has reviewed SNC's request for an exigent amendment and concluded that it meets the standards of 10 CFR 50.91(a)(6) for exigent circumstances. The NRC staff has concluded that exigent circumstances exist because, for the reasons stated above, the interruption in construction activities may impact the construction schedule of the plant and may result in potential rework in backfill activities. In addition, the NRC staff concludes that SNC did not create the exigency, as it promptly filed the amendment request after determining (based in part on a public meeting with the staff on April 6, 2010) that an amendment was required pursuant to 10 CFR 52.39(e) to conduct the requested activities. These circumstances warrant the issuance of the requested amendment prior to conclusion of the 30-day period for public comment as an exigent circumstances amendment. Pursuant to 10 CFR 50.91(a)(6)(i)(A), the staff published a Federal Register notice on May 6, 2010 (75 FR 24993) providing notice of an opportunity for hearing and allowed at least two weeks from the date of that notice for prior public comment. There has been no public comment on such findings.

5.0 FINAL NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

The Commission's regulations in 10 CFR 50.92 state that the Commission may make a final determination that a license amendment involves no significant hazards consideration if operation of the facility in accordance with the amendment would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in the margin of safety.

As required by 10 CFR 50.91(a), the licensee has provided its analysis of the issue of no significant hazards consideration in its letter dated April 20, 2010, as presented below:

1. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No

   The proposed SSAR change does not significantly increase the probability or consequences of an accident previously evaluated in the SSAR. An evaluation was performed to show that the proposed addition of borrow areas to the SSAR does not affect seismic analysis or hydrologic analysis. Category 1 and 2 backfill from areas on the VEGP site not specifically identified in the SSAR is from the same geological formations, and possesses the same properties as backfill obtained from the three areas originally identified in the SSAR. Additionally, the backfill material meets the requirements of SSAR Section 2.5.4.5.3 and will be excavated and placed following the requirements of SSAR Section 2.5.4.5.5. Based on the above, the use of qualified Category 1 and 2 backfill material from areas of the VEGP site not specifically identified in the SSAR does not affect the Vogtle site-specific seismic analyses including the site response for the Ground Motion Response Spectra (GMRS) and the Vogtle site-specific SASSI seismic analyses of the Nuclear Island (NI). Because the backfill material from the additional onsite borrow areas is from the same geological deposit assumed in the analysis and meets the requirements of SSAR Section 2.5.4.5.3 and will be extracted and placed using the requirements of SSAR Section 2.5.4.5.5, the hydrological analysis will be unaffected. As such, the use of Category 1 and 2 backfill material from the VEGP site not specifically identified in the SSAR does not affect the accidental radiation release to groundwater evaluated in the SSAR. Therefore, the proposed SSAR change does not significantly increase the probability or consequences of an accident previously evaluated.

2. Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

   Response: No.

   The proposed SSAR change does not create the possibility of a new or different kind of accident than any accident already evaluated in the SSAR. Category 1 and 2 backfill from areas on the VEGP site not specifically identified in the SSAR is from

the same geological formations, and possesses the same properties as backfill obtained from the three areas originally identified in the SSAR, meets the requirements of SSAR Section 2.5.4.5.3 and will be excavated and placed following the requirements of SSAR Section 2.5.4.5.5. As the backfill material from additional onsite borrow locations will meet all of the criteria contained in the ESP, no new accident scenarios, failure mechanisms or limiting single failures are introduced as a result of the proposed changes. The changes have no adverse effects on any safety-related system and do not challenge the performance or integrity of any safety-related system. Therefore, all accident analyses criteria continue to be met and these changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed amendment involve a significant reduction in a margin of safety?

   Response: No.

   The proposed SSAR change does not involve a reduction in a margin of safety. Category 1 and 2 backfill from areas on the VEGP site not specifically identified in the SSAR is from the same geological formation, possesses the same properties as backfill obtained from the three areas originally identified in the SSAR, meets the requirements of SSAR Section 2.5.4.5.3 and will be excavated and placed following the requirements of SSAR Section 2.5.4.5.5. All evaluations for the use of Category 1 and 2 materials from the VEGP site show that there is no effect on the SSAR's reported foundation bearing capacities, calculated settlements, GMRS, or Foundation Input Response Spectra (FIRS). The evaluations and analyses results demonstrate applicable acceptance criteria are met. Therefore, the proposed changes do not involve a reduction in a margin of safety.

The NRC staff has reviewed the licensee's analysis and, based on that review, the staff concludes that the amendment meets the three criteria of 10 CFR 50.92. Therefore, the NRC staff has made a final determination that the amendment does not involve a significant hazards consideration.

6.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Georgia State official was notified of the proposed issuance of the amendment. The State official had no comments.

7.0 ENVIRONMENTAL CONSIDERATION

Pursuant to 10 CFR 51.32, the Commission has determined that this amendment will not have a significant effect on the quality of the human environment May 21, 2010 (75 FR 28664).

8.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) the amendment does not (a) involve a significant increase in the probability or consequences of an accident previously evaluated, or (b) create the possibility of a new or different kind of accident from any previously evaluated, or (c) involve a significant reduction in a margin of safety and therefore, the amendment does not involve a significant hazards consideration; (2) there is reasonable assurance that the health and safety of the public will not be endangered by construction activities in the proposed manner; (3) such activities will be conducted in compliance with the Commission's regulations; and (4) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

9.0 REFERENCES

1. Letter from B. L. (Pete) Ivey, Southern Nuclear Operating Company, Inc. to NRC, "Southern Nuclear Operating Company Early Site Permit Site Safety Analysis Report Change Request, Vogtle Electric Generating Plant Units 3 and 4, Use of Category 1 and 2 Backfill Material from Additional Onsite Areas On An Exigent Basis for Units 3 and 4." Dated April 20, 2010.

2. Letter from B. L. (Pete) Ivey, Southern Nuclear Operating Company, Inc. to NRC, "Southern Nuclear Operating Company, Vogtle Electric Generating Plant Units 3 and 4, Early Site Permit Site Safety Analysis Report Amendment Request, Response to Request for Additional Information Concerning Exigent Circumstances." Dated April 23, 2010.

3. Letter from B. L. (Pete) Ivey, Southern Nuclear Operating Company, Inc. to NRC, "Southern Nuclear Operating Company, Vogtle Electric Generating Plant Units 3 and 4, Early Site Permit Site Safety Analysis Report Amendment Request, Response to Request for Additional Information." Dated April 28, 2010.

4. Letter from B. L. (Pete) Ivey, Southern Nuclear Operating Company, Inc. to NRC, "Southern Nuclear Operating Company, Vogtle Electric Generating Plant Units 3 and 4, Early Site Permit Site Safety Analysis Report Amendment Request, Response to Request for Additional Information Concerning Hydrology." Dated May 5, 2010.

5. Letter from B. L. (Pete) Ivey, Southern Nuclear Operating Company, Inc. to NRC, "Southern Nuclear Operating Company, Vogtle Electric Generating Plant Units 3 and 4, Early Site Permit Site Safety Analysis Report Amendment Request, Revised Table Title." Dated May 10, 2010.

6. Letter M. K. Smith, Southern Nuclear Operating Company, Inc. to NRC, "Southern Nuclear Operating Company, Vogtle Electric Generating Plant Units 3 and 4, Early Site

Permit Site Safety Analysis Report Amendment Request, Revised Site Safety Analysis Report Markup for Onsite Sources of Backfill." Dated May 13, 2010.

7. SOUTHERN NUCLEAR OPERATING COMPANY, VOGTLE ELECTRIC GENERATING PLANT ESP SITE, DOCKET NO. 52-011, EARLY SITE PERMIT AND LIMITED WORK AUTHORIZATION. Early Site Permit No. ESP-004, U.S. Nuclear Regulatory Commission. ADAMS No.: ML092290457.

8. Southern Nuclear Operating Company Vogtle Early Site Permit Application - Revision 5, December 23, 2008.

9. NUREG-1923, "Safety Evaluation Report for an Early Site Permit (ESP) at the Vogtle Electric Generating Plant (VEGP) ESP Site," August 14, 2009.

10. U.S. Geological Survey Professional Publication 1603, "Geology and paleontology of five cores from Screven and Burke counties, eastern Georgia," 2001.

11. *Foundation Engineering Handbook, A. Vesic, H. Winterkorn and H. Fang, Editors, Van Nostrand Reinhold Co. 1975.*

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